GREEN TECHNOLOGY ACCELERATOR CENTER

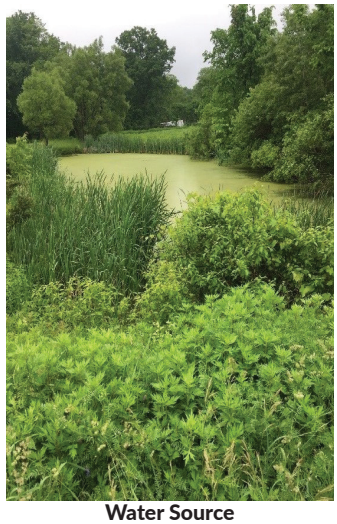
CASE STUDY

NYSP2I Evaluation and Environmental Field Test of BioSand Bag Filter

Located in New Paltz, New York, BioSand Bag Filter, LLC. (BioSand) has created a cost effective water filtration system that is both environmentally and consumer friendly, called the P3 BioSand Bag Filter (BioSand Bag Filter).

The BioSand Bag Filters are slow sand filters, which are a type of filter known for their reliability and ease in operation. These features are key to Biosand's mission of becoming the leading supplier of green, affordable, continuous water filters. Their focus has been on meeting the needs of people whose location in rural or remote areas preclude their ability to access potable water. However, they have recently expanded their interests to include supplying solutions for small scale water filtration needs in developed nations as well as for potable water in emergency response situations.

BioSand Bag Filter Setup



Water Source

CHALLENGE

BioSand requested the New York State Pollution Prevention Institute (NYSP2I) independently evaluate (1) the BioSand Bag Filter setup and procedure from a user's point of view as well as (2) the effectiveness of the BioSand Bag Filter as applied to drinking water applications.

SOLUTION

NYSP2I worked with BioSand to perform an on-site assessment that replicated conditions in the field. NYSP2I staff independently set-up the BioSand Bag Filter using existing documentation and provided feedback to BioSand for improvement opportunities. In addition, NYSP2I worked with certified test labs to assess the quality of incoming water from a pond and holding tank (filter influent), water inlet to the BioSand Bag Filter (secondary filter influent), and the filtered water output from the BioSand Bag Filter at the test site (filter effluent). These samples, which were collected over a 30 day period, were used to evaluate the BioSand Bag Filter performance as applied to drinking water applications. The water quality

CHALLENGE

- BioSand requested NYSP2I to independently evaluate the water filtration effectiveness of their BioSand Bag Filter System, and to assess the product setup and procedures from a user's point of view

SOLUTION

- NYSP2I provided an independent evaluation of the P3 BioSand Bag Filter System setup, procedures, and filter performance as applied to drinking water applications
- NYSP2I worked with certified test labs to assess the quality of incoming water from a pond and holding tank, water inlet to the BioSand Bag Filter, and the filtered water output from the BioSand Bag Filter at the test site

RESULTS

- Work performed by NYSP2I resulted in key findings that will assist BioSand in further developing and commercializing their system
- Success of this product line is forecasted to help create 14 NYS jobs over a three year period

evaluation was based on key parameters from the New York State Department of Health (NYSDOH) Drinking Water Regulations[1] and the EPA Secondary Drinking Water Standards[2].

RESULTS

The work performed by NYSP2I resulted in key findings that will assist BioSand in further developing and commercializing their system, utilizing product manufacturing in New York State (NYS).

- NYSP2I on-site assembly of the BioSand Bag Filter revealed that standardization of instructions and improvement in the frame design could decrease the set up time required and eliminate opportunity for human error.
- The BioSand Bag Filter consistently reduced levels of E. coli, Dissolved Oxygen and Turbidity between the inlet and outlet sampling points over the 30 day test period.
- After 3 weeks, the BioSand Bag Filter met the NYSDOH Drinking Water Regulations[1] for Turbidity and E. coli.
- Total Dissolved Solids met the EPA Secondary Drinking Standards throughout the 30 day testing period.
- Cryptosporidium testing by EMSL Analytical, Inc. indicated no presence of cryptosporidium at either the influent or effluent of the BioSand Bag Filter at day 30 of evaluation.

Test Parameter	NYSDOH Drinking Water Regulations[1]	Filter Demonstrated Capability
E. Coli	No Positive Samples[3]	Yes
Cryptosporidium	No Positive samples	N/A – no positive samples recorded
Turbidity	Less than 1 NTU[4]	Yes
Test Parameter	**EPA Secondary Drinking Standards[2]**	**Filter Demonstrated Capability**
Total Dissolved Solids (TDS)	TDS concentration to be less than or equal to 500 mg/L	Yes

Summary of BioSand Bag Filter Demonstrated Capability during 30 day test period

The results described in this report are applicable to the specific BioSand Bag Filter evaluated, as installed at the Taliaferro Farms, New Paltz ,NY test site from May 4, 2017 thru June 5, 2017. NYSP2I is not a certifying entity, therefore test results do not certify the BioSand Bag Filter in the creation of potable drinking water.

[1]NYS DOH Drinking Water Regulations
https://www.health.ny.gov/environmental/water/drinking/regulations/

[2]EPA Secondary Drinking Water Standards
https://www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance-nuisance-chemicals

[3]Table 6 - https://www.health.ny.gov/regulations/nycrr/title_10/part_5/subpart_5-1_tables.htm

[4]Table 4A - https://www.health.ny.gov/regulations/nycrr/title_10/part_5/subpart_5-1_tables.htm

TESTIMONIAL

"BioSand Bag Filter Co had the opportunity to work with the NYSP2I team under the GTAC program at Rochester Institute of Technology on a project to evaluate our P3 water filter. We knew we had a great idea and product that would serve the needs of thousands of small and remote communities around the world who are currently drinking untreated water. What we needed was an independent evaluation of the setup, procedures and performance of our P3 water filter. What we got was that and so much more. The team did a terrific job and provided us with valuable feedback for ease of setup, use and performance to make our filter all it can be. We are profoundly grateful to the NYS DEC and especially to the NYSP2I team at Rochester Institute of Technology, who brought an impressive blend of deep expertise and professionalism to the independent 3rd party evaluation of our system. With the support provided by NYSP2I, our young company is poised to bring potable water to remote areas, parks, reservations and military outposts in the US and around the world, serving as an engine for job creation in NY."

– Don Kerr, Founder
BioSand Bag Filter, LLC.

NYSP2I PARTNERS

R·I·T
Rensselaer
University at Buffalo
The State University of New York
Clarkson University

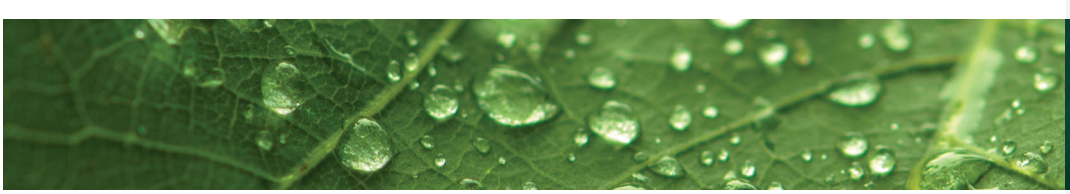
New York Manufacturing Extension Partnership

Funding provided by the Environmental Protection Fund as administered by the New York State Department of Environmental Conservation.

For more information please contact us:

111 Lomb Memorial Drive, Bldg. 78
Rochester, NY 14623

Tel: 585-475-2512
Web: nysp2i.rit.edu
E-mail: nysp2i@rit.edu



R·I·T Golisano Institute for Sustainability
ROCHESTER INSTITUTE OF TECHNOLOGY