

Infiltrator® Quick4® Chambers Used to Treat Deicing Fluid at Buffalo Niagara International Airport



Project

Vertical flow aerated wetland treatment system with infiltration chambers for treatment of spent glycol from deicing operations.

System Designers

Jacques Whitford NAWA Inc.
(now Stantec)

System Location

Buffalo Niagara International Airport (BNIA)

Engineers

Urban Engineers
Buffalo, New York

Contractor

Kandey Company
Buffalo, New York



In 2008, Buffalo Niagara International Airport (BNIA) took an innovative approach to treat spent glycol found in stormwater during the deicing season. The aerated wetland system consisted of below-grade gravel beds which were designed to supply oxygen to bacteria that attached to the gravel. The amount of oxygen can be controlled relative to the level of glycol being treated. A vertical flow configuration was selected in which stormwater is distributed uniformly via infiltration chambers. Stormwater flows over the beds and downwards to an underdrain system. The large application area provided by utilizing Quick4 Standard chambers by Infiltrator Systems, coupled with large gravel voids, minimizes the probability of clogging. Currently, the system is designed for 10,000 lbs. of oxygen demand per day and is roughly the size of four football fields.

A number of criteria led to the selection of this engineered wetland and infiltration bed system in order to meet treatment requirements:

- Provide treatment of cold and variable strength wastewater
- Integrate into the existing stormwater management system
- Handle large seasonal variations
- Be on or close to the airport property
- Not present a bird strike or airside hazard
- Have negligible odor productions
- Low operation and maintenance costs

The primary interest of this system was the ability to accommodate large fluctuations in flow and strength. The fundamental design constraint is areal loading (10,000 pounds of BOD per day) not volumetric flow. This means the system can handle large dilute flows as well as lower concentrated flows.

The treatment system consists of four discrete wetland cells excavated from an existing open area near the airport's main runway. At ground level, only a field of grass is observable. The flow and concentration of the stormwater is closely monitored using electromagnetic flow meters and online analyzers. Also, when necessary, flow is controlled to optimize performance of the wetland. Air and nutrients are supplied to the system to match the pounds of glycol measured.

The system is engineered to maintain an active biomass within the wetland throughout the winter. It is built below ground with an insulating mulch layer on top to maximize water temperature. Come spring and the close of the deicing season, the wetland treatment system will be used to manage stormwater volume. The water level in the gravel beds is fully adjustable, allowing the operator to utilize the beds to buffer the flow from summer storm events. Since the system is already piped for managing peak flows, no additional infrastructure modifications are necessary. The beds provide treatment in the winter and storage in the summer.



INFILTRATOR®
systems inc.

1-800-221-4436
www.infiltratorsystems.com