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### PHOSPHORUS REMOVAL FROM AGRICULTURAL SUB-SURFACE DRAINAGE WASTEWATERS IN A CONSTRUCTED WETLAND

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**ABSTRACT** Constructed wetlands (CW) are an efficient and cost-effective way of removing pollutants from wastewaters. Agricultural sub-surface drains can expel significant amounts of pollutants, such as excessive nutrients, BOD and COD, suspended solids and endocrine disrupters. Excessive Phosphorus is one of the major causes of accelerated eutrophication of freshwater ecosystems, characterized by cyanobacterial blooms. The Sub-Surface Horizontal Flow (SSHF) CW is one of the simplest and most promising CW technologies. It can easily be implemented as a third line of defence Best Management Practice for the alleviation of pollution coming from agricultural sub-surface drains. Water is circulated through a soil media, over which vegetation is grown. The objective of this study is to observe the P-removal efficiency of a SSHF Constructed Wetland. The experiment has been ongoing since 2006 at McGill University's CW pilot-scale experimental site, located in Ste-Anne de Bellevue, Québec. The soil media is coarse grain sand and the CW is planted with Cattails (*Typha latifolia* L.) and Reed Canary Grass (*Phalaris arundica* L.). The actual retention time is 2.2 days, with the theoretical retention time (plug flow assumption) being 1.0 day; the active volume ranges from 56 to 74%. From July 1st to October 1st 2009, the system was continuously fed with 1 L\*min<sup>-1</sup> of a simulated agricultural sub-surface drainage wastewater, containing 0.3 mg\*L<sup>-1</sup> PO<sub>4</sub>-P. The experimental site includes 3 replicates and the P-removal efficiency is monitored on a weekly basis. We will present the results and discuss the evolution of P-removal efficiency throughout the 2009 season.

**Keywords:** Sub-Surface Horizontal Flow Constructed wetland, Agricultural sub-surface drainage wastewaters, Phosphorus removal