Conventional on-site wastewater treatment systems are no longer able to fully meet the needs of coping with the impacts of the variegated pollutants with which they are confronted. Without proper nitrification and denitrification, this implies a large fraction of nutrient loads such as nitrogen and phosphorus, also pathogens such as fecal coliform and E. coli, which indicate the presence of other disease-causing bacteria will flow into groundwater aquifers adversely affecting the water quality and public health. Constructed wetland, a cost-effective small-scale wastewater treatment system with low energy, maintenance requirements, and operational costs may well fill the current gaps. A subsurface constructed wetland system designed as an integral part of a performance-based passive on-site wastewater treatment system was proved effective after receiving septic wastewater flow. Using a suite of selected plant species, it is configured to handle 567 liters per day (150 GPD) of influent for a wastewater treatment and reuse study using green sorption media (recycled and natural materials) at a test center located at the University of Central Florida (UCF).