Second Life® Activated Sludge Aeration Basin

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EXTENDED ABSTRACT

Purpose

This project seeks to explore the possibilities of virtual world computer programs as engineering teaching tools. The incorporation of virtual world teaching tools into curriculums will allow students access to real world engineering applications that they otherwise could not see.

Engineering Concepts

Second Life® is an online virtual world with built in three-dimensional modeling software and Linden Scripting Language, a programing language developed specifically for Second Life®. With these tools, Second Life® allows its users complete creative freedom as well as allowing the user to retain the copyright for their creations. Second Life® is relatively unexplored as an engineering teaching tool with endless possibilities and can potentially replace physical field trips with virtual ones, thus reducing travel time, costs, liability, and logistics.

Wastewater treatment plants are responsible for removing containments from wastewater to produce environmentally friendly fluid and solid waste products. An activated sludge aeration basin is a major part of this process. These basins are a microbial culture of bacteria and other micro-organisms that are responsible for assimilating the organic matter in wastewater. These cultures metabolize the organic material to carbon dioxide, ammonia as well as cellular material.

Significance

This project focuses around the modeling of a steady-state activated sludge aeration basin in Second Life® to be incorporated as a teaching tool for Environmental Engineering courses. Eventually, a virtual, fully-functional wastewater treatment plant is going to be constructed around the aeration basin. Ultimately, this project seeks to use virtual world teaching tools in engineering courses to expand students learning experience.