Progress Report on:

"Evaluation of the Algal Turf Scrubber Technology for Treatment of Agricultural Drainage Water"

A Project for the Caroline County Soil Conservation District

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October 21, 2009

The Caroline County algal turf scrubber (ATS) project officially began with the signing of a Memorandum of Understanding between the Caroline Soil Conservation District and the University of Maryland in early March 2009 but preparatory work for the research started in 2008. John Rhoderick of the Maryland Department of Agriculture provided several tours of farm sites within the agricultural drainage network of the Eastern Shore and he ultimately facilitated the selection of the ATS site on the Collier Farm in Caroline County.

Mr. Rhoderick also arranged for a pilot ATS project on the Harris Farm during the fall of 2008. In this pilot project, a small ATS unit (one m2 in area) was installed adjacent to a drainage ditch and water from the ditch was pumped to the ATS to grow algae. This pilot ATS was operated for several months and its performance demonstrated that algal growth would be supported with drainage ditch waters. There was some concern that herbicides or other runoff chemicals might make the drainage ditch water unsuitable for the application of the ATS technology but the pilot project indicated that this issue would likely not be a limiting factor to algal growth. Algae identified from the pilot project screens included a diatom (Melosira) and several filamentous green algae (Spirogyra and Rhizoclonium) along with other taxa. Additionally, several surveys of algal floras in drainage ditches in the area around Bridgetown, Maryland were undertaken in late 2008 and in 2009 that yielded a diversity of species, including a relatively rare freshwater red alga, Batrachospermum.

Funding for the full-scale project was received by the University of Maryland and an account for the research was established in late March 2009. However, work on construction of the planned ATS on the Collier Farm was delayed when questions were raised by the Natural Resource Conservation Service. The main issue concerned whether an ATS system could be built on CREP enrolled land. After an exchange of emails explaining the project and further deliberations, the project was approved by USDA officials in early summer 2009.

The firm, Living Ecosystems of Easton, Maryland was selected to construct and operate the ATS on the Collier Farm based on the firm's extensive experience with the ATS technology. A contract between Living Ecosystems and the University of Maryland was finalized in the summer of 2009 and construction of the infrastructure of the ATS system began with site surveying. Mr. Collier facilitated the early construction work on the ATS and he continues to provide valuable input to the project. Construction of the dump buckets at the top of the system, the landfill liner and screen, positioning of the experimental raceways and settling basin structures at the bottom of the system have been completed as of early fall 2009.

The remaining work on the infrastructure involves the solar powered pump system that will move water from the drainage ditch to the ATS. This unit has proven to be more of a challenge to acquire than anticipated. A number of solar companies were contacted about this need during the summer of 2009 including some large Maryland companies (Standard Solar and Chesapeake Solar) specializing in residential solar systems and several smaller, local Eastern Shore marine suppliers. A suitable system was finally suggested by Mr. Collier from a company that supplies solar powered pump systems for cattle watering tanks and for irrigation. The supplier is Superior Pump & Equipment of Greensburg, Pennsylvania. After discussion about sizing of the solar panels and pump, a system was selected and requisitioned in early October 2009. Once this solar powered pump system is delivered and is installed, pumping of water from the drainage ditch will begin and algal growth will be initiated on the screen of the ATS.