

# Transgenic Aquatic Species Task Force Workshop

General Subject Matter: Application to culture microalgae

Date and Time: Friday, January 22, 2010, 10:00-12:00 PM

Place: Division of Aquaculture, 1203 Governor's Square Boulevard, Suite 501,  
Tallahassee, FL 32301

A copy of the agenda may be obtained by contacting: Paul Zajicek, 1203 Governor's Square Boulevard, Fifth Floor, Tallahassee, FL 32301, (850)488-4033. Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 3 days before the workshop/meeting by contacting: Paul Zajicek at (850)488-4033. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

Transgenic Aquatic Species Task Force  
1203 Governor's Square Blvd, Fifth Floor  
Tallahassee, Florida  
January 22, 2010  
10:00 AM

## **Agenda**

Welcome and introductions  
R. Sherman Wilhelm

Old Business

New Business

Algenol Biofuels Application  
Edward Legere, Executive Vice President

Adjourn

Transgenic Aquatic Species Task Force  
1203 Governor's Square Blvd, Suite 501  
Tallahassee, Florida  
January 22, 2010  
10:00 AM

## **Meeting Minutes**

### **Welcome and Introductions**

The chair, Sherman Wilhelm, welcomed members and guests at 10:07 AM and requested that attendees introduce themselves.

#### Members present:

Alice Agasan, PhD, Division of Animal Industry  
Woody Fraser, Division of Animal Industry  
Scott Hardin, Florida Fish and Wildlife Conservation Commission  
Jeffrey Hill, PhD, University of Florida  
Phil Laipis, PhD, University of Florida  
Ed Philips, PhD, University of Florida  
Richard Stephens, Division of Food Safety  
Sherman Wilhelm, Division of Aquaculture

#### Members absent:

Terrie Bert, PhD, Florida Fish and Wildlife Conservation Commission  
Wayne Dixon, PhD, Division of Plant Industry  
Marc Engel, Division of Food Safety  
John Fruin, PhD, Division of Food Safety

#### Guests:

John Coleman, PhD, Algenol Biofuels  
Frank Jochem, PhD, Algenol Biofuels  
Kal Knickerbocker, Division of Aquaculture  
Ed Legere, Algenol Biofuels  
Craig Smith, Algenol Biofuels  
Paul Zajicek, Division of Aquaculture

### **Old Business**

There was none before the Task Force.

### **New Business**

Mr. Wilhelm provided a brief overview that the Task Force was assembled to consider an application by Algenol Biofuels to utilize transgenic cyanobacteria at their Florida-based research and development facility to investigate ethanol production parameters. The facility holds an Aquaculture Certificate of Registration issued by the Division of Aquaculture. The Division is seeking a recommendation(s) from the Task Force. He invited an Algenol Biofuels representative to brief the Task Force.

Mr. Legere described their research and development facility, company history, and reiterated they were intending to test the sequential scale-up of microalgae culture in photobioreactors using cyanobacteria that included a gene construct to produce ethanol. The results of their Florida research would be utilized to inform operations at an out-of-state pilot plant that would lead to commercialization on a larger scale.

Mr. Wilhelm opened the floor to questions from Task Force members that were participating by conference call.

Task Force members initially focused on the potential production of toxins by the transformed organisms or as by-products of culture on a large scale. A question was raised as to whether bioassays had been performed. Algenol Biofuels representatives related that they had performed whole genome analysis for gene sequences known to produce toxins on the wild-type algae and transformed algae and did not find any indication that toxins would be produced. There was general agreement by the Task Force that toxin production was unlikely at the research and development phase but was cautious that larger scale production may yield toxic byproducts. Algenol Biofuels representatives agreed that commercialization at a larger scale would require this analysis to resolve this question and they anticipated that federal and state agency review of the commercialization phase would require such an effort.

The Task Force members asked a series of questions exploring how water and algae are handled on the site and how the disposal of spent algae and production water was processed. Algenol Biofuels representatives reviewed the production cycle, end of cycle shut down, and sterilization and disposal of algae biomass. The Task Force suggested that a test sample be taken from the harvested biomass cake to determine viability prior to disposal by the biological hazards disposal company. Algenol Biofuels representatives agreed that this was a good suggestion.

The Task Force members then focused on organism survivability outside the photobioreactors. Algenol Biofuels representatives described testing that involved transporting ditch water collected from the research and development facility site to their Baltimore lab for replicated tests, under optimum conditions, for organism survivability. They could not detect any organisms after 7 to 8 days and were confident the algae would not grow outside the photobioreactors. Discussion focused on the environmental adaptability of the proposed cyanobacterium as untransformed and transformed cells. The long term use of the proposed cyanobacterium, approximately 30 years as a laboratory organism, and the metabolic pathway changes that created biochemical constraints indicate survivability of untransformed or transformed cells was unlikely.

This discussion shifted to containment measures prior to and during a natural disaster (e.g., hurricane). Algenol Biofuels representatives described the dewatering process that is preceded by photobioreactor chlorination. Dewatering would require several days. Chlorination can occur in 20 minutes. The Task Force suggested that a natural disaster management plan be written. Algenol Biofuels representatives agreed.

The discussion shifted to the potential for horizontal transfer of the gene construct to conspecific organisms, whether the species are native to Florida waters, and survivability. Algenol Biofuels representatives described experiments they had conducted, based upon National Institute of Health guidelines, involved co-cultivating transformed algae with *E. coli*. No horizontal transfer was found.

Algenol Biofuels representatives explained that the marine cyanobacteria are marine obligates and were collected from the South Atlantic. The proposed cyanobacterium is a freshwater cyanobacteria originally collected from California and adapted to saltwater. Task Force members commented that work to determine whether the algae are native to Florida waters would be difficult and not necessarily definitive. Genome analysis should show differences with wild-type because of prolonged laboratory experimentation with the proposed cyanobacterium. The Task Force suggested that consideration be given to complete survivability tests at the Florida site as in-house work or through analysis performed by suitably competent and permitted laboratories.

Discussion focused on fitness data that the Task Force has examined during prior transgenic species applications. As a result, Algenol Biofuels agreed to provide thermal tolerance and biomass productivity data for the untransformed and transformed algae and any other experiments that support the conclusion that survivability is unlikely.

Mr. Wilhelm summarized the meeting. Algenol Biofuels will provide:

- A natural disaster management plan with Quality Assurance, Quality Control practices associated with water and biomass sterilization.
- Fitness data.

Algenol Biofuels representatives agreed to these requests and would deliver the materials by the middle or end of next week. They thanked the Task Force for their review.

Mr. Wilhelm reminded the Task Force members that Algenol Biofuels has identified the information provided to the Department as being a confidential trade secret as provided under Florida case law. He advised them that Department policy does not allow release of this information under a public records request.

The meeting adjourned at 11:53 AM.