Appendix A: Environmental Laws and Regulations

Appendix A provides a summary of the environmental laws and regulations relevant to this Final PEIS; laws and regulations are listed alphabetically.

Agricultural Act of 2014 (Pub. L. 113-79)

The Agricultural Act of 2014, also known as the U.S. Farm Bill, is renewed every five years and governs Federal farm and food policy. The most current U.S. Farm Bill was enacted in 2014 and addresses agricultural and food policy through a variety of programs, including commodity support, nutrition assistance, and conservation. The U.S. Farm Bill provides an opportunity for policymakers to address comprehensively most of the programs of the U.S. Department of Agriculture (USDA).

Agricultural Bioterrorism Protection Act of 2002 (7 U.S.C. § 8401)

The Agricultural Bioterrorism Protection Act of 2002 provides, in part, that the Secretary of Agriculture must establish by regulation a list of each biological agent and each toxin that the Secretary determines has the potential to pose a severe threat to animal or plant health, or to animal or plant products. The Act requires the biennial review and republication of the list of select agents and toxins and the revision of the list. The Act establishes, by regulation, standards and procedures governing the possession, use, and transfer of biological agents and toxins that have been determined to have the potential to pose a severe threat to both human and animal health, to animal health, to plant health, or to animal and plant products.

Bald and Golden Eagle Protection Act of 1940 (42 U.S.C. § 668-668d)

The Bald and Golden Eagle Protection Act of 1940 was passed to prevent the extinction of the bald eagle. From the time the bald eagle was adopted as our Nation's official symbol in 1782 to 1940, bald eagle population numbers rapidly declined due to hunting, pesticide use, and habitat loss. The Act prohibits the take, possession, sale, purchase, barter, or offer to sell, purchase, or barter, export or import any part of a bald eagle. In 1962, Congress amended the Act to include golden eagles, recognizing that the population of the golden eagle had declined at such an alarming rate that it was threatened with extinction. As part of the 1962 amendment, the Secretary of the Interior is authorized to grant permits to Native Americans for traditional religious use of eagles and eagle parts and feathers (USFWS 2013c).

CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508)

The purpose of Council of Environmental Quality (CEQ) regulations on National Environmental Policy Act of 1969 (NEPA) is to assist Federal agencies in effectively implementing the environmental policy and "action-forcing" provisions of NEPA (40 CFR Parts 1500-1508, 1969). These regulations provide the necessary direction to ensure compliance with the procedures and achieve the goals of the Act. Public officials are able to make decisions based on understanding of potential environmental consequences, and take actions to protect, restore, and enhance the environment.

Clean Air Act (42 U.S.C. § 7401–7671g)

The Clean Air Act (CAA) is the primary Federal legislation that addresses air quality. Under the CAA and its amendments, the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for six "criteria pollutants" that threaten human health and welfare (40 CFR Part 50). The criteria pollutants are carbon monoxide (CO), nitrogen dioxide (NO_2) (one of several oxides of nitrogen), ozone (O_3), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter equal to or less than 10 microns equal (PM_{10}) or less than 2.5 microns (fine particles) ($PM_{2.5}$), and lead (Pb). Additionally, the CAA includes provisions for reducing soil erosion to preserve air quality. Exposed soil surfaces are vulnerable to wind erosion, which carries small soil particulates into the atmosphere. This suspended particulate matter is regulated under the CAA.

The CAA requires states to achieve and maintain the NAAQS within their borders. Each state may adopt standards stricter than those of the National standard. Areas that violate air quality standards are designated as nonattainment areas for the relevant pollutants. Nonattainment areas face restrictions on industry expansion within the surrounding area, transportation planning impacts, permitting delays, special requirements for vehicles, and grade of fuel sold in the area. EPA requires nonattainment areas to develop a State Implementation Plan (SIP) that details implementation, maintenance, and enforcement of the NAAQS, including emission limitations and control measures.

General conformity, established under section 176(c) (4) of the CAA, provides states a tool to help them improve air quality in areas that do not meet the NAAQS. Under the General Conformity Rule, Federal actions that occur in a nonattainment or maintenance area must conform to the air quality plans established in the applicable SIP. The Conformity Rule ensures that Federal activities do not cause or contribute to new violation of NAAQS; actions do not cause additional, worsen existing violations of, or contribute to new violations of the NAAQS; and attainment of the NAAQSs is not delayed.

Endangered Species Act of 1973 (16 U.S.C. § 1531)

The Endangered Species Act of 1973 (ESA) requires Federal agencies to conserve and protect endangered species. The ESA authorizes the determination and listing of species as endangered (a species in danger of extinction throughout all or a significant portion of its range) and threatened (a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range). In addition, the Act prohibits the unauthorized taking, possession, sale, and transport of endangered species, and the conservation of threatened and endangered animals and plants and for the habitats in which they are found. The lead Federal agencies implementing the ESA are the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife, such as whales, and anadromous fish, such as salmon.

- Section 7 of the ESA is the mechanism by which Federal agencies ensure that their actions, including those they fund or authorize, do not jeopardize the existence of any listed endangered or

threatened species or their habitats, or result in the destruction or adverse modification of a critical habitat.

- If a Proposed Action may adversely affect a listed species or critical habitat, the Federal agency must prepare a Biological Assessment and initiate a formal consultation with USFWS and NMFS, as appropriate. After reviewing the Biological Assessment, the Services prepare a Biological Opinion stating whether the Proposed Action is likely to jeopardize the continued existence of a listed species or cause the destruction or adverse modification of critical habitat. The purpose of the consultation process is to ensure avoidance and minimization of potential adverse impacts on a listed species or critical habitats. Formal consultation is not required if the Federal agency determines, and USFWS or NMFS concurs in writing, that the Proposed Action is not likely to adversely affect listed species.
- The ESA also prohibits all persons subject to U.S. jurisdiction, including Federal agencies, to "take" an endangered or threatened species. The "take" prohibition includes any harm or harassment. The ESA protects habitat considered essential to the conservation of a listed endangered or threatened species, with some areas designated as critical habitat requiring special management considerations or protection.

Executive Order 11990, Protection of Wetlands

Signed in 1977, Executive Order (EO) 11990, *Protection of Wetlands*, directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. Federal agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

EO 12898, signed in 1994, addresses the environmental and human health effects of Federal actions on minority and low-income populations with the goal of achieving environmental protection for all communities. The EO directs Federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law. EO 12898 directs each agency to develop a strategy for implementing environmental justice. The Order is also intended to promote nondiscrimination in Federal programs that affect human health and the environment, as well as provide minority and low-income communities access to public information and public participation. In addition, EO 12898 established an Interagency Working Group on environmental justice chaired by the EPA Administrator and comprised of the heads of 11 Federal departments or agencies and several White House offices.

EO 13112, Invasive Species

Signed in 1999, EO 13112, *Invasive Species*, requires all Federal agencies to prevent the introduction of invasive species, provide control, and minimize the economic, ecologic, and human health impacts that invasive species may cause. Invasive species are defined as non-native species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species include plants, animals, and other organisms (e.g., microbes). These species are typically introduced by human actions; however, they can be unconsciously carried to new locations by other organisms (e.g., seed in a bird's gullet), wind, and water.

EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, strengthens the protection of migratory birds and their habitats by directing Federal agencies to take certain actions that implement the Migratory Bird Treaty Act. EO 13186 requires that each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement, within two years, a Memorandum of Understanding (MOU) with the USFWS that shall promote the conservation of migratory bird populations. DOE entered into an MOU with USFWS regarding implementation of EO 13186 on September 12, 2013 (U.S. Department of Energy -- Office of Enterprise Assessments, 2013).

EPA Worker Protection Standard for Agricultural Pesticides (40 CFR Part 170)

EPA's 1992 Worker Protection Standard (WPS), a regulation for agricultural pesticides, is aimed at reducing the risk of pesticide poisonings and injuries among agricultural workers and pesticide handlers. The WPS offers protections to agricultural workers and pesticide handlers that work at agricultural establishments, including farms, forests, nurseries, and greenhouses. The Worker Protection Standard contains requirements for pesticide safety training, notification of pesticide applications, use of personal protective equipment, restricted-entry intervals after pesticide application, decontamination supplies, and emergency medical assistance.

Farmland Protection Policy Act of 1981 (Pub. L. 97–98, 7 U.S.C. § 4201)

Prime and unique farmlands are protected under the Farmland Protection Policy Act of 1981. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for successfully producing crops. Unique farmland is defined as land that is used for the production of certain high-value crops, such as citrus, tree nuts, olives, and fruits. The Act requires Federal agencies, in consultation with the USDA-Natural Resources Conservation Service (NRCS), to examine the potentially adverse effects to these resources before approving any action that would irreversibly convert farmlands to nonfarm uses.

Federal Food, Drug, and Cosmetic Act (21 U.S.C. § 301 et seq.)

Under the Federal Food, Drug, and Cosmetic Act (FFDCA), food manufacturers are responsible to ensure that the products they market are safe and properly labeled. Under the Act, EPA sets tolerances, or maximum residue limits, for pesticide residues on foods. Tolerances are the legal limit for a pesticide chemical residue in or on a food such that there is a reasonable certainty that no harm would result from aggregate exposure to the pesticide chemical residue. This includes all anticipated dietary exposures and all other exposures for which there is reliable information. Once a tolerance is established, the residue level in the tolerance is the trigger for enforcement actions. That is, if residues are found above that level, the commodity will be subject to seizure.

Federal Insecticide, Fungicide, and Rodenticide Act of 1947 (7 U.S.C. § 136)

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) is the primary law that provides Federal control of pesticide distribution, sale, and use. All pesticides used in the United States must be registered (licensed) by EPA and properly labeled. FIFRA establishes standards for storage and use of pesticides in a manner that does not harm human health or the environment. Consideration is given to worker exposure ecological exposure and food chain imports.

Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.)

The objective of the 1972 Amendments of the Federal Water Pollution Control Act, known as the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of "waters of the United States." These include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The CWA established several provisions, as detailed below:

- **Section 303(d)** requires states and EPA to identify waters not meeting state water quality standards and to develop total maximum daily loads. A total maximum daily load is the maximum amount of a pollutant that a waterbody can receive and still be in compliance with state water quality standards. After determining total maximum daily loads for impaired waters, states are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source in order to meet the State standards.

  Section 320 establishes the National Estuary Program. It provides for the identification of nationally significant estuaries that are threatened by pollution for the preparation of conservation and management plans and calls for Federal grants to states, interstate, and regional water pollution control agencies to implement such plans.

Fish and Wildlife Conservation Act of 1980 (16 U.S.C. § 2901-2911)

The Fish and Wildlife Conservation Act of 1980 declares that fish and wildlife are of ecological, educational, esthetic, cultural, recreational, economic, and scientific value to the United States. The Act

encourages all Federal agencies to conserve and promote conservation of non-game fish and wildlife and their habitats, and to provide financial and technical assistance to states in order to conduct inventories and develop plans for the conservation of non-game wildlife.

Lacey Act of 1900 (16 U.S.C. § 3371–3378)

Under the Lacey Act, it is unlawful to import, export, sell, acquire, or purchase fish, wildlife, or plants taken, possessed, transported, or sold: (1) in violation of U.S. or Indian law, or (2) in interstate or foreign commerce involving any fish, wildlife, or plants taken possessed or sold in violation of state or foreign law. The law covers all fish and wildlife and their parts or products, plants protected by the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and those protected by state law. Commercial guiding and outfitting are considered a sale under the provisions of the Act. The Food, Conservation, and Energy Act of 2008 amended the Lacey Act to expand its protection to a broader range of plants and plant products without an import declaration. When the Lacey Act was passed in 1900, it became the first Federal law protecting wildlife and enforcing civil and criminal penalties for the illegal trade of animals and plants. Today, it regulates the import of any species protected by international or domestic law and prevents the spread of invasive species.

Migratory Bird Treaty Act of 1918 (16 U.S.C. § 703-711)

The Migratory Bird Treaty Act of 1918 (MBTA) as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. The Act states that it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg or any such bird, unless authorized under a permit issued by the Secretary of the Interior. A "take" includes any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof. Under the MBTA, only the direct "take" of migratory birds requires authorization by USFWS. Actions that may adversely affect or indirectly "take" birds such as habitat destruction or manipulation are not a violation of the MBTA unless migratory birds are killed or wounded during the activity. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

Occupational Safety and Health Act of 1970 (29 U.S.C. § 651-678)

The Occupational Safety and Health Act (OSHA) establishes standards to protect workers, including standards on industrial safety, noise, and health standards. The law requires employers to train employees on hazards in the workplace, to provide information to employees, to report occupational injuries and illnesses to the Federal government, and to keep records of same, and to provide controls and protective equipment as well. Detailed technical bulletins called material safety data sheets must be posted and available for employees to read and use to avoid chemical hazards.

Plant Protection Act (7 U.S.C. § 7701 et seq.)

The Plant Protection Act (PPA) was enacted in 2000 to prevent the importation, exportation, and spread of pests injurious to plants, and to provide for their control and eradication and for the certification of plants. The Act provides the Secretary of the USDA authority to issue regulations "to prevent the introduction of plant pests into the United States or the dissemination of plant pests within the United States." The Secretary has delegated that authority to Animal and Plant Health Inspection Service (APHIS), a division of the USDA. Acting pursuant to that delegation, APHIS has promulgated regulations governing "the introduction of organisms and products altered or produced through genetic engineering that are plant pests or are believed to be plant pests." Under those regulations, certain genetically engineered plants are presumed to be "plant pests"—and thus "regulated articles" under the PPA—until APHIS determines otherwise. The PPA consolidates nine preexisting pest quarantine and exclusion statutes into a comprehensive law.

Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (42 U.S.C. § 201 et seq.)

The Public Health Security and Bioterrorism Preparedness and Response Act, or the Bioterrorism Act was enacted in 2002 to improve the ability of the U.S. to prevent, prepare for, and respond to bioterrorism and other public health emergencies. The Act provides for the regulation of certain biological agents and toxins that have the potential to pose a severe threat to both human and animal health, to animal health, to plant health, or to animal and plant products. The Act establishes standards and procedures governing the possession, use, and transfer of biological agents and toxins. This includes requirements concerning registration, security risk assessments, safety plans, security plans, emergency response plans, training, transfers, record keeping, inspections, and notifications. For the Department of Health and Human Services, the Centers for Disease Control and Prevention (CDC) is designated as the agency with primary responsibility for implementing the provisions of the Act; APHIS is the agency fulfilling that role for the USDA.

Resource Conservation and Recovery Act of 1976 (42 U.S.C. § 6901 et seq.)

The Resource Conservation and Recovery Act (RCRA) governs the generation, storage, treatment, transport, and disposal of hazardous waste. The objectives of RCRA are to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner. RCRA regulates the management of solid waste (e.g., garbage), hazardous waste, and underground storage tanks holding petroleum products or certain chemicals.

Safe Drinking Water Act of 1974 (42 U.S.C. § 300f et seq.)

The Safe Drinking Water Act establishes a Federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. Congress amended the Act in 1986, mandating dramatic changes in nationwide safeguards for drinking water and establishing new Federal enforcement

responsibility on the part of EPA. The 1986 amendments require the EPA to establish Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Best Available Technology treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity. The MCLGs are maximum concentrations below which no negative human health effects are known to exist. The 1996 amendments set current Federal MCLs, MCLGs, and Best Available Technology for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.

- **Section 1424(e)** of the Safe Drinking Water Act authorizes the Sole Source Aquifer Protection Program. A sole source aquifer supplies at least 50 % of the drinking water consumed in an area overlying the aquifer. Any Federally-funded proposed project with the potential to contaminate a designated sole source aquifer is subject to EPA review.

U.S. Department of Energy (DOE) Environmental Justice Strategy (DOE/LM-1460)

In response to EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, DOE prepared and issued its Environmental Justice Strategy in 1995, which integrated the requirements of EO 12898 into DOE operations. In 2007, DOE re-established its Environmental Justice Task force to review and update the current Strategy and develop an Environmental Justice Five-Year Plan. Both the EO and the Strategy require that DOE establish and maintain an integrated approach for identifying, tracking, and monitoring environmental justice across the Agency.

U.S. DOE's Guidance on Consideration of Intentional Destructive Acts

In December 2006, DOE Office of General Counsel issued interim guidance stipulating that NEPA documents completed for DOE actions and projects, specifically Environmental Assessments and Environmental Impact Statements, should explicitly consider intentional destructive acts (i.e., acts of sabotage or terrorism). The guidance notes that DOE is developing new guidance on considering the level of analysis for intentional destructive acts in NEPA documents.

U.S. DOE and USFWS MOU to Protect Migratory Birds

In order to enhance collaboration in promoting the conservation of migratory bird populations, DOE and USFWS have entered into a MOU pursuant to the MBTA and EO 13186 on September 12, 2013. Updating an MOU signed in 2006 which focused on conservation activities at DOE sites and interactions with regional USFWS offices, this MOU increases collaboration between DOE and USFWS and focuses on research, third-party funding activities, and issues associated with the protection of migratory birds and their habitats. The 2013 MOU directs DOE to coordinate with USFWS regarding Proposed Actions that may have direct and indirect adverse effects on migratory birds or their habitats through the NEPA process.

12 Appendix B: Draft PEIS Comments and DOE Responses

Comment No.	Name	Organization	Page No.
1	Amanda McBride	Alabama Historical Commission / SHPO	B-2
2	[REDACTED]	[REDACTED]	B-3
3	Leslie Griffith	Environmental Law Institute	B-4
4	Robert Natelson	Private Citizen	B-6
5	Don Ogden	The Enviro Show / WXOJ & WMCB	B-7
6	Mary Giacoletti	Private Citizen	B-8
7	Aviva Glaser	National Wildlife Federation	B-9
8	Rachel Smolker	Biofuel Watch	B-15
9	Nancy Strong	Private Citizen	B-16
10	Todd Newland	Private Citizen	B-17
11	Bettina Sullivan	Virginia Department of Environmental Quality	B-18
12	Joyce Stanley	U.S. Department of the Interior	B-43
13	Marolyn Robbins-Guarr	Private Citizen	B-47
14	Bridget Collins	Association of Fish & Wildlife Agencies	B-49
15	Carol Bearss	Private Citizen	B-53
16	Martha Crouch	Center for Food Safety	B-55
17	Susan Bromm	U.S. Environmental Protection Agency	B-73
18	Sara Sullivan	Global Justice Ecology Project	B-76
19	Ravi Grover	Private Citizen	B-80
20	Greg Mixon	South Carolina Department of Natural Resources	B-81

1 – Alabama Historical Commission	DOE Response
Name: Amanda McBride **Email:** amanda.mcbride@preservеala.org **Organization:** Alabama Historical Commission **Title:** SHPO Environmental Review Coordinator **Address:** 468 S. Perry St. Montgomery AL, 36130-0900 US **Contact preference:** Mail **Topic:** Environmental Concerns **1-1** **Comment:** The Alabama State Historic Preservation Office has reviewed the EHEC PEIS and concurs with the DOE's findings. We understand that activities will be confined to disturbed plowzone, and that any project activities that will disturb ground beyond this depth or otherwise cause ground disturbance will be submitted for our review per Section 106 on an individual basis. **Date Submitted via EHEC Website:** 1/28/2015 2:32:12 PM	**1-1:** Thank you for your comment.

2 – Redacted	DOE Response
Name: [REDACTED] **Email:** [REDACTED] **Organization:** [REDACTED] **Title:** [REDACTED] **Address:** [REDACTED] **Contact preference:** None **Topic:** General **2-1** **Comment:** I worked for [REDACTED] to develop high performance genetically engineered (GE) trees (freeze tolerant Eucalyptus spp.). Are these technologies going to be part of the PEIS? **Date Submitted via EHEC Website:** 1/30/2015 10:06:44 PM **NOTE:** This commenter requested that their personal information (name, email, address, etc.) not be publicly displayed on the EHEC Website.	**2-1:** Thank you for your comment. The specific plant species for any proposed EHEC Program(s) are not known at the present time.

3 – Environmental Law Institute

Public Hearing (Oral Comment)

Name: Leslie Griffith
Organization: Environmental Law Institute
Topic: General
Comment:

3-1 Hello. Hi. My name is Leslie Griffith, and I represent the Environmental Law Institute [ELI], a nonpartisan research organization based in Washington, D.C. We work to promote a healthy environment, prosperous economies, and vibrant communities founded on the rule of law. ELI's research suggests that the Engineered High Energy Crop program, or EHEC program, may result in the introduction and spread of invasive plants. If DOE funds cultivation of potentially invasive plans and does not require best management practices to reduce the risk of escape, this program may lead to invasions that cause significant environmental and economic harm. We believe that DOE can improve the draft PEIS for the EHEC program in several important respects.

3-2 First, we seek clarification on the scope of the EHEC program and its relationship to the APHIS BRS permitting system. The Draft PEIS definition suggests that both GE crops and crops engineered through other methods could fall within the EHEC program. DOE does not use the same definition of "genetic engineering" used by the USDA, and it does not clearly explain why or what the differences will mean in practice. And the PEIS does not clearly discuss whether or how DOE will assess risks associated with EHECs that are not regulated by USDA. DOE can improve the PEIS by clarifying the scope of the program and the relationship between the program and USDA regulatory processes. Though the Draft PEIS states that confined field trials will require permits from APHIS, we urge DOE to clarify whether and how this process will extend to non-genetically engineered EHECs or what alternative project specific assessment and risk mitigation measures will be used for projects not subject to USDA permitting. Next, DOE needs

3-3 to explain how project specific analysis will proceed and who will conduct the analysis. The Draft PEIS refers several times to site specific analysis that would take place later in the EHEC process. However, it is unclear whether this refers to the APHIS BRS permitting process to additional project specific NEPA analysis or to both. Other than discussing the APHIS BRS permit process, DOE does not explain what this analysis would consist of or what agency will be responsible. DOE can strengthen the PEIS by explaining who will conduct the required additional analysis and what the framework for doing so will be. It should also explain whether project specific findings will translate into binding decisions on project approval.

3-4 Next, project specific evaluation should include a weed risk assessment for every proposed crop and exclude plants identified as high risk. Weed risk assessments are a peer reviewed, cost effective, decision support tool to predict the invasive risk of bioenergy plants. The Draft PEIS refers to the possibility of conducting such assessments during site specific analysis, but it doesn't clearly state that they will always be performed or how DOE will use the results. We urge DOE to require weed risk assessments for every application and to exclude projects for EHECs that indicate a high risk of invasion. Relatedly, DOE should not rely solely on the USDA noxious weed risk to screen out potentially invasive crops. This Federal noxious weed list is not intended to be predictive or comprehensive, and it does not include many known invasive species, including some proposed bioenergy crops. DOE should not fund projects involving listed noxious weeds, but it also should not rely on this list as an indication of the invasion risk associated with plants that are not listed.

3-5 Next, DOE should consider a default list of best management practices to apply and make funding contingent on their use. The Draft PEIS is not clear about whether BMPs are required or voluntary or

DOE Response

3-1: Thank you for your comments. Thank you for your comment. DOE reviewed concerns related to the potential for invasiveness. Section 4.5 has been revised to identify that given the size of the field trials for Alternatives 2 and 3, the potential for invasiveness could be minor to moderate adverse impacts. DOE or another Federal agency proposing a Federal action related to an EHEC Program would be required to complete environmental reviews, such as NEPA reviews, for site- and plant-specific projects.

3-2: Proposed EHECs may include either GE or non-transgenic crops; non-transgenic crops include plants with agronomic practices to increase energy yields from bioenergy crops per acre. Section 4.5 has been revised to identify that given the size of the field trials for Alternatives 2 and 3, the potential for invasiveness could be minor to moderate adverse impacts. The ability to regulate the release of novel interspecific hybrids falls under the regulatory authority of USDA APHIS, not DOE. Interspecific hybrids have been used for hundreds of years using crop breeding for a desired trait, usually hardiness or disease resistance. These hybrids are typically sterile; therefore, the risk of outcrossing and invasiveness is low.

3-3: Recipients seeking funding or permits from DOE or another Federal agency for proposed projects relating to EHECs could be required to apply for USDA APHIS permits and notifications in compliance with applicable law and regulations. In addition, DOE or another Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. DOE or another Federal agency may require a recipient of funding or a permit to implement appropriate mitigation as a condition of funding or permitting for a proposed EHEC project.

3-4: Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection.

It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs - tailored to each proposed EHEC project - to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs

3 – Environmental Law Institute (cont.)

about how BMPs will be selected for specific projects. BMPs are a crucial tool in mitigating the risk of escape and enabling more effective eradication if escape does occur. We suggest that DOE require consideration of a common set of BMPs in every project application. Furthermore, DOE should require the use of all appropriate BMPs as a condition of each funded project. Next, DOE should rethink its conclusion that the invasive species impacts will be minor.

3-5 cont.

The available evidence does not support DOE's evaluation of the potential impacts. Research has established that many proposed biofuel feedstocks have high invasive potential. Without robust screening procedures and best management practices, the risk of introduction and escape may be unacceptably high. Moreover, the environmental and economic impacts of escapes that do occur may be seriously and costly. Nonnative plants are spreading across roughly 700,000 hectares of U.S. wildlife habitat annually, and several billion dollars are spent each year in the United States to control these plants. One proposed biofuel feedstock, Arundo donax, is considered among 100 worst invasive species worldwide. DOE's Draft PEIS does not accurately reflect the significant impact that invasive EHECs could have on the ecosystem and the economy. We encourage DOE to reconsider the potential environmental impacts from invasive species introduction associated with the EHEC program.

3-6

Finally, DOE should consider a broader range of alternatives. The acreage based alternatives in the Draft PEIS do not explore the full range of reasonable alternatives available to DOE in designing the EHEC program. While project size is an important component affecting invasion risk, it is insufficient to allow DOE to make an informed decision. Other feasible options exist that would mitigate invasive species risk, including the use of a weed risk assessment as an initial screening tool and mandated use of certain best management practices. We appreciate the opportunity to comment on this issue. Thank you very much.

3-7

Date: 2/17/2015

DOE Response

as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids - and specific BMPs - falls under the regulatory authority of USDA APHIS, not DOE.

The environmental reviews may include a site-specific analysis to determine if the proposed EHEC is on a Federal or state noxious weed list; conduct a weed risk assessment and climate matching analysis; and evaluate the potential of the proposed EHEC to crosspollinate with related species or other closely related taxa. Potential impacts of proposed EHECs on the environment could be caused by the hybridization of the GE plants and their wild relatives that may result in a weedy or invasive plant species causing economic or ecological damage. Such risks are considered by USDA APHIS BRS prior to use of GE organisms outside of controlled conditions (U.S. Department of Agriculture -- Animal and Plant Health Inspection Service, 2006). A field release permit request would need to be approved by USDA APHIS BRS and, depending on the nature of the GE trait, by EPA for any GE crop proposed for establishment as a proposed EHEC (U.S. Department of Agriculture -- Animal and Plant Health Inspection Service, 2006).

3-5: DOE agrees that BMPs are a critical component to mitigate risk. Site- and plant-specific BMPs would be identified in future project-specific environmental reviews, such as NEPA reviews. DOE (or another Federal agency) may require a recipient of funding or a permit to implement appropriate mitigation as a condition of funding or permitting for a proposed EHEC project.

3-6: DOE reviewed concerns related to the potential for invasiveness. Section 4.5 has been revised to identify that given the size of the field trials for Alternatives 2 and 3, the potential for invasiveness could be minor to moderate adverse impacts. DOE or another Federal agency proposing a Federal action related to an EHEC Program would be required to complete environmental reviews, such as NEPA reviews, for site- and plant-specific projects.

3-7: As the purpose and need for the Proposed Action for this project is to develop and implement one or more programs to catalyze the development and deployment of EHECs, DOE considered a range of confined field trial sizes (in acreage) to progress from the lab to demonstration size allowing for commercial production of an EHEC. The scale alternatives are illustrative, intended to provide environmental information regarding the range of potential impacts of the reasonable alternatives, and thus inform future consideration of EHEC Programs.

4 – Private Citizen	DOE Response
Public Webinar (Written Comment) **Name:** Robert Natelson **Organization:** **Topic:** Impacts **Comment:** **4-1** Thank you for the draft PEIS and web event. Are there any guidelines or restrictions so far in proposing intro cropping of an EHEC and a second non-EHEC crop? Work to evaluate crops and soil before and after an EHEC are also of interest. **Date:** 2/24/2015	**4-1:** Thank you for your comment. Future site- and plant-specific environmental compliance reviews, such as NEPA reviews, would identify guidelines for EHEC cropping requirements.

5 – The Enviro Show / WXOJ & WMCB

3/23/2015 Genetically Engineered Trees or Crops as Biofuels?

From: "Tribal Scribal" <lionoak@gmail.com>
Subject: Genetically Engineered Trees or Crops as Biofuels?
Date: Wed, February 25, 2015 3:22 pm
To: comments@engineeredhighenergycropsPEIS.com

5-1 In this era of climate disruption we need to move away from burning trees or mono-crops to create energy. Incineration is a technology of the past. We strongly urge you not to proceed with any program of GMO tree propagation for biofuel.

Don Ogden, Producer
The Enviro Show
WXOJ & WMCB
140 Pine St.
Florence, MA 01062

****
CAPE WIND: RIGHT PROJECT/WRONG PLACE!!
Checkout The Enviro Show on WXOJ-LP, 103.3fm. Northampton, MA, Tuesdays, 6pm
[Webstreaming at:
http://www.valleyfreeradio.org/listen/web-stream-listening-help/]
Also on WMCB, Greenfield; 107.9, Mondays at 9pm. Streaming at
http://wmcb.net/Listen.html
[Blog w/links and YOUR comments at: http://enviroshow.wordpress.com/]
https://www.facebook.com/enviro.show
****

Attachments:

untitled-[1].plain
Size: 0.8 k
Type: text/plain

https://box443.bluehost.com:2096/cpsess9461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=17… 1/1

DOE Response

5-1: Thank you for your comment.

6 – Private Citizen

3/23/2015 Biofuel/combustion

From: "mary giacoletti" <mpowergiacoletti@gmail.com>
Subject: Biofuel/combustion
Date: Thu, February 26, 2015 6:23 pm
To: comments@engineeredhighenergycropsPEIS.com

6-1

Reconsider the folly of burning biomass.

In the hierarchy of pollutants, the worst material

to burn is green waste; slightly better is dung;

then there is wood; better than wood is coal.

And we all know how bad coal is. So why would you

turn your attention to something worse; why devote

energy to doing something more harmful. Think.

Before the planet is completely destroyed.

M. Power Giacoletti

9349 Jasper Way

San Simeon, CA 93452

(805) 924-1690 mpowergiacoletti@gmail.com

Attachments:

untitled-[1].plain
Size: 0.5 k
Type: text/plain

https://box443.bluehost.com:2096/cpsess9461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=17... 1/1

DOE Response

6-1: Thank you for your comment.

7 – National Wildlife Federation

Public Webinar (Oral Comment)

Name: Aviva Glaser
Organization: National Wildlife Foundation
Topic: Various
Comment:

7-1 My name is Aviva Glaser. I am a senior policy specialist with the National Wildlife Federation. I want to thank the Department of Energy for the opportunity to comment on this draft PEIS. NWF has 4,000,000 members per quarter across the country including many in the southeastern U.S., so we are very concerned about invasive species.

We do believe that it is important to transition to renewable energy and we appreciate all the work that the DOE has been working and doing to identify and promote new sources of renewable energies, including bioenergy. However, we do think it is important that moving forward with new energy sources it needs to be done in a way that doesn't threaten or harm natural resources and wildlife and doesn't have unintended consequences, and with energy crops we have this fundamental problem as you know in that the characteristics that make a bioenergy crop a good crop are the same characteristics things like clip growing, hardy, tolerant, the same characteristics that describe an invasive species. And, many of those are the characteristics that are likely to be enhanced through engineering, which can significantly increase the risk of invasion.

7-2 Also, genetic modification can raise risks of breeding with wild type species, resulting in essentially invasive hybrids. I do want to acknowledge and thank the DOE for recognizing in the draft PEIS that engineered high energy crops may prevent an invasive species risk; however, we do have some concerns about the analysis. We are going to be submitting more details and in-depth comments in writing, but I did want to briefly raise a few issues as we have this opportunity to do so today.

First, we are concerned about the draft PEIS conclusion that impacts from potential escape of engineered high energy crops into the environment would be minor. Invasive species are known to pose significant threats and costs to regional ecosystems as well as local economies, and we think this conclusion should be revisited and at the very least we would certainly appreciate any additional explanation for that finding.

7-3 Second, we believe that Department of Energy should require a weed risk assessment for every proposed species, and should exclude crops that are identified as high risk through the weed risk assessment. Weed risk assessments, including the weed risk assessment that was created by USDA recently, are proven tools that can be used to identify those plants with a high risk causing environmental or economic issues, but the draft PEIS currently does not require the use of these tools when considering engineered high energy crops. So we urge DOE to require weed risk assessments across the board and to condition project approval on an acceptable weed risk assessment outcome.

7-4 The last point I just wanted to briefly touch on is that we certainly appreciate the discussion of best management practices to reduce the risk of invasion, and indeed best management practices can be an important tool reduce invasion risk. However, it's not clear in the draft PEIS whether the best management practices would be voluntary or mandatory, how they are chosen for each project and type, so we recommend that DOE create a default list of best management practices that can then be

DOE Response

7-1: Thank you for your comments.

7-2: DOE reviewed concerns related to the potential for invasiveness. Section 4.5 has been revised to identify that given the size of the field trials for Alternatives 2 and 3, the potential for invasiveness could be minor to moderate adverse impacts. DOE or another Federal agency proposing a Federal action related to an EHEC Program would be required to complete environmental reviews, such as NEPA reviews, for site- and plant-specific projects.

Future site- and plant-specific environmental documentation, such as NEPA reviews, would be required prior to the proposed EHEC field trial plot selection. The environmental reviews may include a site-specific analysis to determine if the proposed EHEC is on a Federal or state noxious weed list; conduct a weed risk assessment and climate matching analysis; and evaluate the potential of the proposed EHEC to crosspollinate with related species or other closely related taxa.

Potential impacts of proposed EHECs on the environment could be caused by the hybridization of the GE plants and their wild relatives that may result in a weedy or invasive plant species causing economic or ecological damage. Such risks are considered by USDA APHIS BRS prior to use of GE organisms outside of controlled conditions (U.S. Department of Agriculture -- Animal and Plant Health Inspection Service, 2006). A field release permit request would need to be approved by USDA APHIS BRS and, depending on the nature of the GE trait, by EPA for any GE crop proposed for establishment as a proposed EHEC (U.S. Department of Agriculture -- Animal and Plant Health Inspection Service, 2006).

7-3: Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

7 – National Wildlife Federation (cont.)

7-4 cont. tailored almost as a checklist to each project species and each specific site, and then importantly we recommend that the funding for projects be contingent upon the use of best management practices.

So to kind of wrap up and conclude our points, we urge you to revisit the conclusion that invasion risk from escape of engineered high energy crops into the environment would be minor, and we think that funding for engineered high energy crops should be contingent upon the use of best management practices and have a low risk outcome using best management practices that are tailored to each site and project.

That's all I have today so thank you very much for your time. I really appreciate all the opportunities that we have had so far and will continue to have to weigh in as this program moves forward and we certainly look forward to continuing to engage with you on it.

Date: 2/26/2015

DOE Response

7-4: Site- and plant-specific BMPs would be identified in future environmental reviews for proposed EHEC projects. DOE or another Federal agency may require a recipient of funding or a permit to implement appropriate mitigation as a condition of funding or permitting for a proposed EHEC project.

7 – National Wildlife Federation (cont.)	DOE Response

3/23/2015 Comments on draft PEIS for EHEC program

From: "Aviva Glaser" <GlaserA@nwf.org>
Subject: Comments on draft PEIS for EHEC program
Date: Tue, March 17, 2015 2:03 pm
To: "comments@engineeredhighenergycropsPEIS.com" <comments@engineeredhighenergycropsPEIS.com>

Please accept the attached comments from 6 groups representing millions of members in the southeastern United States. Please let me know if you have any questions or concerns.

Regards,

Aviva Glaser

Aviva Glaser

Senior Policy Specialist

National Wildlife Federation

202-797-6616

GlaserA@nwf.org

We've moved! Note our new address:
1990 K St NW

Suite 430

Washington, DC 20006

Attachments:

untitled-[1.1].plain
Size: 0.4 k
Type: text/plain

EHEC comment ltr SE affiliates.pdf
Size: 124 k
Type: application/pdf
Info: EHEC comment ltr SE affiliates.pdf

https://box443.bluehost.com:2096/cpsess0461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=19... 1/1

7 – National Wildlife Federation (cont.)

March 17, 2015

Dr. Jonathan Burbaum, Program Director
Advanced Research Projects Agency-Energy (ARPA-E)
U.S. Department of Energy
ATTN: EHEC PEIS
1000 Independence Avenue, SW, Mailstop-950-8043
Washington, DC 20585

Re: DOE/EIS-0481 Draft Programmatic Environmental Impact Statement on Engineered High Energy Crops

Dear Mr. Burbaum:

7-5 The undersigned groups, representing well over half a million sportsmen and conservationists in the southeastern United States, appreciate this opportunity to provide comments to the Department of Energy (DOE) on the Draft Programmatic Environmental Impact Statement (Draft PEIS) on Engineered High Energy Crops (EHECs).

We understand the importance of transitioning to homegrown sources of renewable energy, and we support the DOE's efforts to identify and promote new sources of renewable energy. However, we believe that it is critical that we move forward with these renewable energy sources in a way that does not unintentionally threaten or harm our natural resources and native wildlife. This includes ensuring that energy crops, including DOE's proposed EHECs, do not become invasive. We appreciate DOE's recognition in the Draft PEIS that EHECs may indeed present an invasive species risk. However, it is our belief that the Draft PEIS does not recognize the full magnitude of the potential harm associated with the cultivation of potentially invasive plants as energy crops nor does it provide adequate measures to manage these risks. We therefore urge DOE to amend the Draft PEIS to address the following issues:

1. **Magnitude of invasion risk**

7-6 The Draft PEIS concludes that the potential invasive species impacts associated with the proposed EHEC program are minor. However, the proposed EHEC program as described in the draft PEIS appears to have a significant potential to promote the introduction and spread of invasive species, which could lead to substantial costs to the environment and economy. Studies have shown that energy crops consistently present a higher risk of invasion than other plants, and if planted without adequate screening procedures and best management practices (BMPs), may escape from cultivation and become established in the environment.[1]

Importantly, as we have seen time and time again, the environmental and economic impacts of escapes that occur can be serious and costly. Non-native plants are spreading across roughly 700,000 hectares of U.S. wildlife habitat annually, and several billion dollars are spent each year in the United States to control these plants.[2] Competition with or predation from non-native species is a primary risk factor for nearly half of threatened or endangered species under the Endangered Species Act.[3] One study has estimated that the harm from and costs of control for invasive species totals $120 billion annually.[4] Florida alone spends more than $50 million a year

DOE Response

7-5: Thank you for your comments.

7-6: DOE reviewed concerns related to the potential for invasiveness. Section 4.5 has been revised to identify that given the size of the field trials for Alternatives 2 and 3, the potential for invasiveness could be minor to moderate adverse impacts. Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. The Federal agency proposing an EHEC Program, or their grantee recipient, would be required to prepare environmental documentation, such as NEPA reviews, for site- and plant-specific projects to identify concerns and required mitigation. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

7 – National Wildlife Federation (cont.)

DOE Response

just to eradicate exotic weeds from fields, pastures, canals, ponds, lakes, rivers and greens.[5] Just one species, kudzu, which was intentionally introduced, infests an estimated seven million acres in the Southeastern US and costs approximately $500 million dollars in lost farm and timber production annually.[6] DOE's Draft PEIS does not accurately reflect the substantial unintended consequences that invasive plants could have on the ecosystem and the economy of Southeastern states; we therefore urge DOE to reconsider the potential environmental impacts from invasive species introduction associated with the EHEC program.

7-6 cont.

2. Weed Risk Assessments

Weed Risk Assessments (WRAs), including the one created by USDA, can help to identify plants with a high risk of causing environmental or economic harm. WRAs are a well-established and accurate tool for evaluating the invasiveness risk of plants and predicting which plants pose a high risk of harm. Unfortunately, the PEIS does not clearly require the use of WRAs when considering the invasive potential of EHECs. The undersigned groups urge DOE to incorporate WRAs as a primary screening tool prior to approval of EHECs. Prior to the distribution of funding, not only should WRAs be used to evaluate EHECs, but high risk feedstocks should be excluded from receiving funding from the agency. We believe that this could significantly reduce the risk of major invasive species impacts associated with the EHEC program.

7-7

Additionally, it is worth noting that existing regulatory lists of invasive species and noxious weeds are not a substitute for WRAs. The fact that a plant is not on a noxious weed list does not mean that it is not invasive or does not have the potential to be invasive. USDA has listed only a few known invasive species as noxious weeds, in part because the noxious weed program is not intended to be a comprehensive listing but rather to identify weeds affecting agriculture. As a result, weeds are often listed only after they are widespread, and plants affecting natural areas (but not agriculture) are rarely listed, even if they cause substantial environmental or economic harm. As a result, while DOE should certainly consult noxious weed lists when reviewing EHECs, it should not conclude that a plant is not invasive if it is not listed. However, any feedstock that is listed as state or federal noxious weed clearly should be excluded from eligibility for EHEC funding. We urge DOE to require WRAs across the board and to condition project approval on an acceptable WRA outcome, provided that the feedstock is not listed as a noxious weed on state or federal lists and that it does not receive a high risk WRA score.

3. Best Management Practices

We appreciate DOE's discussion of the use of Best Management Practices (BMPs) to combat invasive species risk. Unfortunately, however, the Draft PEIS is not clear about whether BMPs are required or voluntary, or about how BMPs will be selected or required for specific projects. To minimize the risk that EHECs spread beyond confined field trials, DOE should clearly establish a set of BMPs whose consideration and use, where appropriate, will be required as a condition of federal support. In addition to prevention and monitoring, BMPs must also extend to containment, eradication, and financial assurance in the case of escape, and we encourage DOE to incorporate these elements into a baseline, or default, list of BMPs. By establishing a default list of BMPs that project applicants and regulators must consult and determine whether to apply in a given project, DOE can ensure adequate consideration and mitigation of risks. We urge DOE to require each project to use appropriate BMPs as a condition of each funded project.

7-8

7-7: The ability to regulate the release of novel interspecific hybrids falls under the regulatory authority of USDA APHIS, not DOE. Section 4.5 has been revised to identify that site- and plant-specific BMPs would follow USDA APHIS permit requirements and could include procedures to minimize escapes during planting, transport, harvesting, storage, and management; monitoring protocols to identify any species escapes; and methods to control and eradicate escaped EHECs. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

7-8: Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts and to BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

7 – National Wildlife Federation (cont.)

Conclusion:

7-9

Under Executive Order 13,112 (1999), DOE may "not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species" unless the benefits clearly outweigh the potential harm and all feasible risk minimization measures are taken. We have seen many examples in the Southeastern US of invasive species, introduced with the best of purposes, escaping and causing major economic and ecological impacts. It is critical that we avoid making these mistakes again. We therefore thank DOE for acknowledging that EHECs may pose an invasion risk. However, we strongly urge the agency to revisit the conclusion in the Draft PEIS that any impacts from escape of EHECs into the environment would be minor, and we seek additional explanation for this finding; escaped EHECs that prove invasive could cause significant harm and costs to the economy and environment of our states. We also believe that the DOE should require a Weed Risk Assessment for every proposed species, exclude those crops identified as high-risk, and require BMPs for all approved crops. We look forward to continued engagement with DOE on these issues. If you have any questions regarding these comments, please do not hesitate to contact us.

Sincerely,

Manley Fuller
Florida Wildlife Federation

Todd Holbrook
Georgia Wildlife Federation

Brad Young
Mississippi Wildlife Federation

Tim Gestwicki
North Carolina Wildlife Federation

Ben Gregg
South Carolina Wildlife Federation

Aviva Glaser
National Wildlife Federation

---

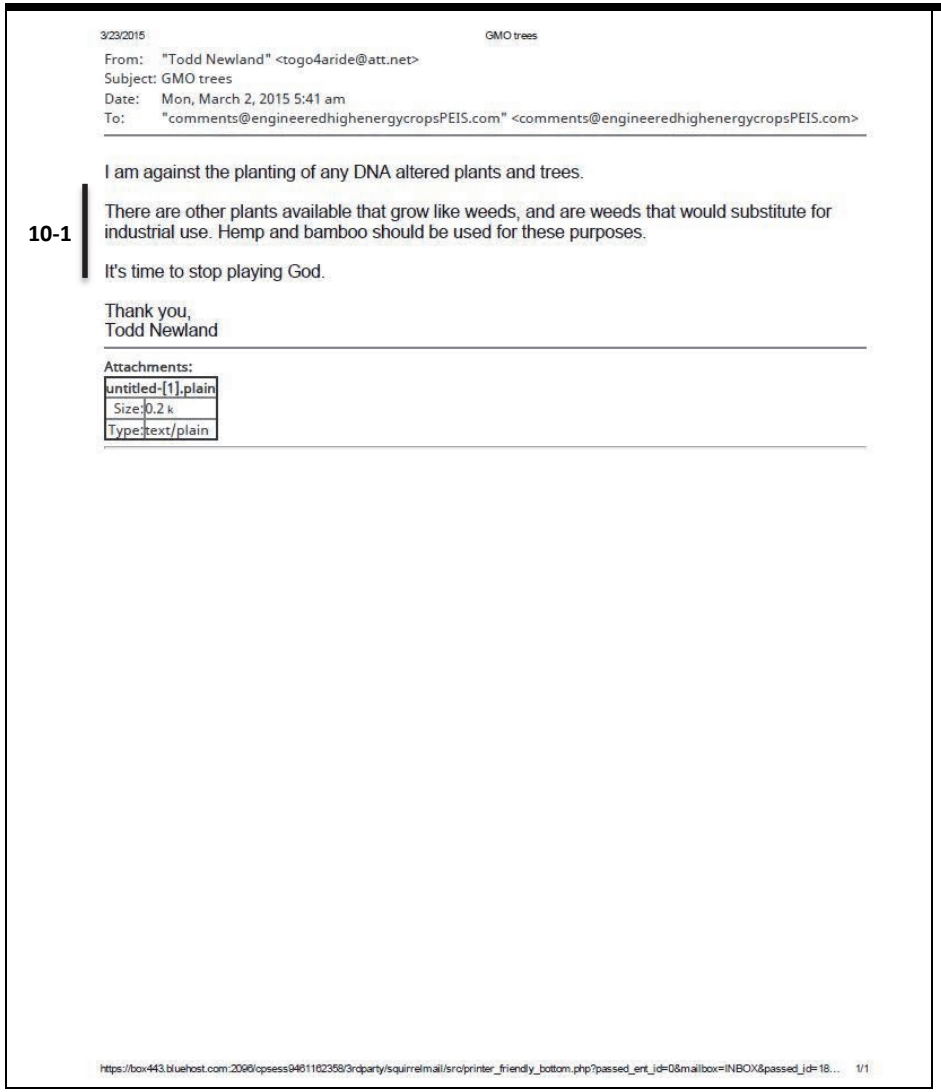
[1] Buddenhagen, C.E. et al. 2009. *Assessing Biofuel Crop Invasiveness: A Case Study*. PLoS ONE 4: e5261.
[2] Pimentel, D. et al. 2005. *Update on the environmental and economic costs associated with alien-invasive species in the United States*. Ecological Economics **52**: 273-288.
[3] Ibid.
[4] Ibid.
[5] National Park Service and Florida Fish and Wildlife Commission. 2013. *Florida Invaders*. http://www.nps.gov/ever/learn/nature/upload/2013-Invaders-Reprint-for-Web.pdf
[6] Florida Forest Service http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Our-Forests/Forest-Health/Invasive-Non-native-Plants

DOE Response

7-9: As identified previously, DOE reviewed concerns related to the potential for invasiveness. Section 4.5 has been revised to identify that given the size of the field trials for Alternatives 2 and 3, the potential for invasiveness could be minor to moderate adverse impacts. The Federal agency proposing an EHEC Program, or their grantee recipient, would be required to prepare environmental documentation, such as NEPA reviews, for site- and plant-specific projects to identify concerns and required mitigation. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. The environmental reviews may include a site- and plant-specific analysis to determine if the proposed EHEC is on a Federal or State noxious weed list; conduct a weed risk assessment and climate matching analysis; and evaluate the potential of the proposed EHEC to cross pollinate with related species or other closely related taxa. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

8 – Biofuel Watch	DOE Response
8-1 **Public Webinar (Oral Comment)** **Name:** Rachel Smolker **Organization:** **Topic:** General **Comment:** Here is my question in full. I am concerned about how these genetically engineered energy plants will be contained during testing so there are no escapes. Will USDA be overseeing DOE's trials in the same way it does in other GE field trials? If so, how will field trials of the growing list of genetically engineered energy crops USDA has decided not to regulate be managed? For example, will DOE step in and regulate field trials of GE plants that USDA is refusing to regulate, many of which are engineered specifically as energy crops, such as series high biomass sorghum or Arpogens high wood density loblolly pine. How will these be treated by DOE? **Date:** 2/26/2015	**8-1:** Thank you for your comments. Recipients seeking funding or permits from DOE or another Federal agency for proposed EHEC Programs would be required to apply for USDA APHIS permits and notifications in compliance with applicable laws and regulations. DOE would require all proposed EHECs to follow USDA APHIS permit requirements. In addition, DOE or another Federal agency proposing a Federal action related to an EHEC Program would be required to complete environmental reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts and BMPs. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

9 – Private Citizen	DOE Response
3/23/2015 he trees From: "Nancy Strong" <strongnancy77@yahoo.com> Subject: he trees Date: Mon, March 2, 2015 11:18 am To: "comments@engineeredhighenergycropsPEIS.com" <comments@engineeredhighenergycropsPEIS.com> **9-1** Please,do not release he trees into our environment!! Sent from Yahoo Mail on Android Attachments: untitled-[1].plain Size: 0 k Type: text/plain https://box443.bluehost.com:2096/cpsess9461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=18... 1/1	**9-1:** Thank you for your comment.

10 – Private Citizen	DOE Response
	**10-1:** Thank you for your comment.

3/23/2015 GMO trees

From: "Todd Newland" <togo4aride@att.net>
Subject: GMO trees
Date: Mon, March 2, 2015 5:41 am
To: "comments@engineeredhighenergycropsPEIS.com" <comments@engineeredhighenergycropsPEIS.com>

I am against the planting of any DNA altered plants and trees.

10-1 There are other plants available that grow like weeds, and are weeds that would substitute for industrial use. Hemp and bamboo should be used for these purposes.

It's time to stop playing God.

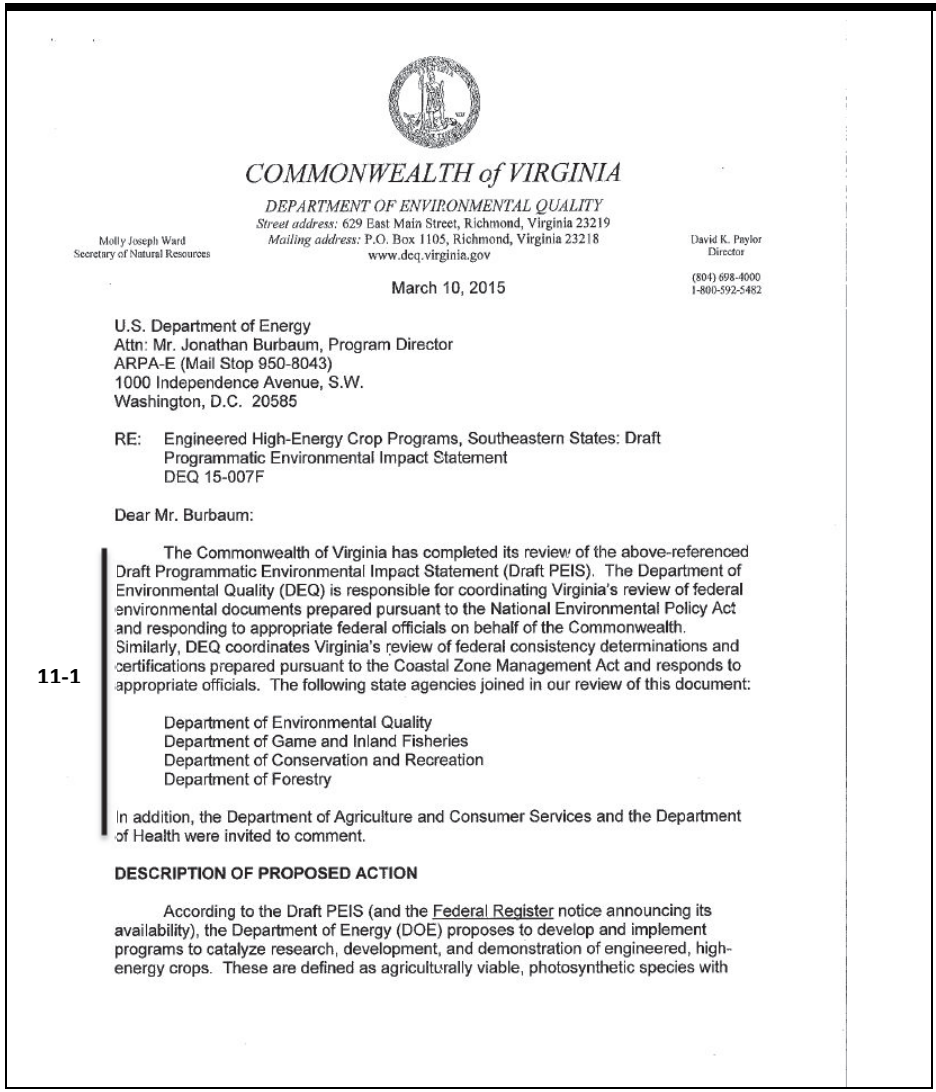
Thank you,
Todd Newland

Attachments:

untitled-[1].plain	
Size:	0.2 k
Type:	text/plain

https://box443.bluehost.com:2096/cpsess9461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=18... 1/1

11 – Virginia Department of Environmental Quality	DOE Response



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

March 10, 2015

U.S. Department of Energy
Attn: Mr. Jonathan Burbaum, Program Director
ARPA-E (Mail Stop 950-8043)
1000 Independence Avenue, S.W.
Washington, D.C. 20585

RE: Engineered High-Energy Crop Programs, Southeastern States: Draft Programmatic Environmental Impact Statement
DEQ 15-007F

Dear Mr. Burbaum:

11-1 The Commonwealth of Virginia has completed its review of the above-referenced Draft Programmatic Environmental Impact Statement (Draft PEIS). The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act and responding to appropriate federal officials on behalf of the Commonwealth. Similarly, DEQ coordinates Virginia's review of federal consistency determinations and certifications prepared pursuant to the Coastal Zone Management Act and responds to appropriate officials. The following state agencies joined in our review of this document:

Department of Environmental Quality
Department of Game and Inland Fisheries
Department of Conservation and Recreation
Department of Forestry

In addition, the Department of Agriculture and Consumer Services and the Department of Health were invited to comment.

DESCRIPTION OF PROPOSED ACTION

According to the Draft PEIS (and the Federal Register notice announcing its availability), the Department of Energy (DOE) proposes to develop and implement programs to catalyze research, development, and demonstration of engineered, high-energy crops. These are defined as agriculturally viable, photosynthetic species with

11-1: Thank you for your comments.

11 – Virginia Department of Environmental Quality (cont.)

construct and operate all stationary sources in the region as well as to monitor emissions from these sources for compliance. As a part of this mandate, the environmental documents for new projects to be undertaken in the State are also reviewed.

1(b) Comments. In the event projects are undertaken in ozone non-attainment or ozone maintenance areas, all precautions are necessary to restrict emissions of volatile organic compounds and oxides of nitrogen.

1(c) Requirements which may Apply. The following regulatory requirements may apply to activities undertaken under the proposed program. Questions on these requirements may be directed to the appropriate DEQ Regional Office, depending on the location of the activities in question. See "Regulatory and Coordination Needs," item 1, below.

1(c)(i) Open Burning. If project activities include the open burning or use of special incineration devices for the disposal of demolition material, this activity must meet the requirements of 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC 5-130-100 of the *Regulations* for open burning, and it may require a permit. The *Regulations* provide for, but do not require, the local adoption of a model ordinance concerning open burning. Appropriate local officials should be contacted to determine what local requirements, if any, exist.

11-2

1(c)(ii) Fugitive Dust Emissions. During any construction activities, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 *et seq.* of the *Regulations for the Control and Abatement of Air Pollution*. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

1(c)(iii) Fuel-burning Equipment. Should activities under the program require the installation of fuel-burning equipment (e.g., boilers, generators, compressors, or other equipment), a permit may be required prior to beginning construction of the facility (9 VAC 5-80, Article 6, Permits for New and Modified Sources).

2. Wetlands and Water Quality. The Draft PEIS discussed the affected water environment in southeastern states in Chapter 3 (pages 3-10 through 3-28 (file pages 73-90), sections 3.3 through 3.3.2.3), and environmental consequences in Chapter 4 (pages 4-5 through 4-13 (file pages 175-183), sections 4.3 through 4.3.5).

3

DOE Response

11-2: Air quality concerns are not anticipated from the Proposed Action. However, future EHEC-specific environmental compliance reviews, such as NEPA reviews, would identify any air quality concerns by reviewing attainment and non-attainment areas for the proposed locations, emission impacts (if applicable), and combustion equipment that may be used.

11 – Virginia Department of Environmental Quality (cont.)

2(a) Agency Jurisdiction. The State Water Control Board (SWCB) promulgates Virginia's water regulations, covering a variety of permits to include Virginia Pollutant Discharge Elimination System Permit, Virginia Pollution Abatement Permit, Surface and Groundwater Withdrawal Permit, and the Virginia Water Protection Permit (VWPP). The VWPP is a state permit which governs wetlands, surface water, and surface water withdrawals/impoundments. It also serves as § 401 certification of federal Clean Water Act § 404 permits for dredge and fill activities in waters of the U.S. The VWPP Program is under the Office of Wetlands and Stream Protection (OWSP), within the DEQ Division of Water Quality Programs.

2(b) State Wetlands Policy. The Commonwealth does not support the filling of wetlands, particularly when alternative sites have been identified. It is the policy of the Commonwealth of Virginia to first avoid impacts to wetlands before considering other mitigation measures such as minimization and compensation. The Virginia Water Protection Permit regulations state that "mitigation means sequentially avoiding and minimizing impacts to the extent practicable, and then compensating for remaining unavoidable impacts of a proposed action" (9 VAC 25-210-10). According to the State Water Control Law (Virginia Code § 62.1-44.15:5D):

> ...except in compliance with an individual or general Virginia Water Protection Permit issued in accordance with this subsection, it shall also be unlawful to conduct the following activities in a wetland: (i) new activities to cause draining that significantly alters or degrades existing wetland acreage or functions, (ii) filling or dumping, (iii) permanent flooding or impounding, or (iv) new activities that cause significant alteration or degradation of existing wetland acreage or functions. Permits shall address avoidance and minimization of wetland impacts to the maximum extent practicable. A permit shall be issued only if the Board finds that the effect of the impact, together with other existing or proposed impacts to wetlands, will not cause or contribute to a significant impairment of state waters or fish and wildlife resources.

2(c) Federal Wetlands Policy. Federal wetlands mitigation policy is guided by a Memorandum of Agreement between the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency that clarify a three-step approach to avoiding, minimizing, and compensating for unavoidable impacts (see Clean Water Act Section 404 (b)(1) *Guidelines Mitigation Memorandum of Agreement*, February 1990). The Corps first makes a determination that potential impacts have been avoided to the maximum extent practicable; remaining unavoidable impacts will then be mitigated to the extent appropriate and practicable by requiring steps to minimize impacts and, finally, compensate for aquatic resource values. This sequence is considered satisfied where the proposed mitigation is in accordance with specific provisions of a Corps- and EPA-approved comprehensive plan that ensures compliance with the compensation requirements of the Section 404(b)(1) Guidelines of the Clean Water Act. (Examples of such comprehensive plans may include Special Area Management Plans, Advance Identification areas (Section 230.80), and State Coastal Zone Management Plans).

11-3 ***2(d) Comments.*** DEQ's Office of Wetlands and Stream Protection (DEQ-OWSP) notes that some of the prose in the Draft PEIS seems to suggest that jurisdictional wetlands

4

DOE Response

11-3: DOE agrees with VA DEQ on concerns for wetlands. DOE or another Federal agency proposing a Federal action related to an EHEC Program would be required to complete environmental reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts and BMPs. If possible encroachment on wetlands might occur for future EHEC projects, site-specific correspondence would be conducted with the U.S. Army Corps of Engineers and state agencies, to determine if jurisdictional wetlands would be impacted and to establish appropriate mitigation to avoid or minimize potential adverse impacts. The geographic scope for this Final PEIS is limited to existing croplands, pasturelands, and forested areas. Proposed EHEC field trials would not occur within any jurisdictional wetlands. No direct impacts to wetlands from implementation of the Final PEIS Alternatives would occur. Future site- and plant-specific environmental reviews would identify wetlands within the project area to ensure the consideration of this resource.

11 – Virginia Department of Environmental Quality (cont.)

DOE Response

might be affected by program activities. Specifically, wetlands are mentioned in a section of the "Affected Environment" chapter devoted to resources not analyzed in detail: "... to determine if jurisdictional wetlands would be impacted and to establish appropriate mitigation to minimize adverse impacts" (Draft PEIS, page 3-105 (file page 167), section 3.11.3, Wetlands sub-heading (third paragraph of section). DEQ-OWSP reminds the Department of Energy that applicable federal and state laws require that potential wetlands be first *avoided* in any planning process. Unavoidable impacts should then be *minimized*, or else mitigated through compensatory offsets. (See state and federal wetland policy statements, items 2(b) and 2(c), above).

11-3 cont.

2(e) Requirement. In the event that activities under the program give rise to wetland or stream impacts, including temporary impacts, that fall outside existing agricultural exemptions, permits from DEQ and the Army Corps of Engineers would likely be required. Those permits would mandate appropriate compensatory mitigation for unavoidable stream and wetland impacts. See "Regulatory and Coordination Needs," item 2, below.

3. Solid and Hazardous Waste Management. The Draft PEIS does not analyze waste management as such, but addresses human health and safety impacts from exposures to pesticides and other agricultural chemicals from crop production and harvest activities (pages 4-51 through 4-53 (file pages 221-223), sections 4.9 through 4.9.5.2.).

3(a) Agency Jurisdiction. Solid and hazardous wastes in Virginia are regulated by the Virginia Department of Environmental Quality, the Virginia Waste Management Board (VWMB) and the U.S. Environmental Protection Agency. These agencies administer programs mandated by the federal Resource Conservation and Recovery Act, the Comprehensive Environmental Response Compensation and Liability Act (commonly called Superfund), and the Virginia Waste Management Act. DEQ administers regulations established by the VWMB and reviews permit applications for completeness and conformance with facility standards and financial assurance requirements. All Virginia localities are required, under the *Solid Waste Management Planning Regulations*, to identify the strategies they will follow on the management of their solid wastes to include items such as facility siting, long-term (20-year) use, and alternative programs such as materials recycling and composting.

3(b) Findings. DEQ's Division of Land Protection and Revitalization (DEQ-DLPR) indicates that the Draft PEIS did not address solid or hazardous waste issues, and did not indicate that a search of either federal or state databases was conducted. Since no specific sites were identified, DEQ-DLRP offers general guidance which may apply to a proposed program or project (item 3(c), next).

11-4

3(c) General Guidance on Environmental Investigations. When an environmental impact report is written for specific sites, it should include an environmental investigation on and near the properties selected in order to identify any solid or hazardous waste sites or issues related to the project area. The databases include the Permitted Solid

5

11-4: In future site- and plant-specific environmental documentation, such as NEPA reviews, DOE, or another Federal agency would review solid and hazardous waste sites and identify any concerns related to the project area.

11 – Virginia Department of Environmental Quality (cont.) | **DOE Response**

11-4 cont. Waste Management Facilities, Virginia Environmental Geographic Information Systems (Solid Waste, Voluntary Remediation Program, and Petroleum Release sites), CERCLA Facilities, and Hazardous Waste Facilities databases.

3(c)(i) Permitted Solid Waste Management Facilities Database. This is a list of active solid waste facilities in Virginia.

3(c)(ii) CERCLA Facilities Database. This is a list of active and archived CERCLA (EPA Superfund Program) sites.

3(c)(iii) Hazardous Waste Facilities Database. This is a list of hazardous waste generators, hazardous waste transporters, and hazardous waste storage and disposal facilities. Data for the CERCLA Facilities and Hazardous Waste Facilities databases are periodically downloaded by DEQ-DLPR from the U.S. EPA's website.

3(c)(iv) Virginia Environmental Geographic Information Systems (VEGIS). The "What's in My Backyard" application displays cross-media geographical features in proximity to a selected site/address for different facility search parameters.

3(c)(v) Accessing the DEQ Databases. Please see the enclosed comments from DEQ's Division of Land Protection and Revitalization (letterhead memo, Coe to Ellis, dated February 23, 2015, pages 2-3).

3(d) General Comments. Any soil suspected of contamination, or wastes that are generated, must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations.

3(d)(i) Asbestos and/or Lead-based Paint. All structures being demolished, renovated, or removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP are found, state regulations as well as federal waste regulations must be followed. See "Regulatory and Coordination Needs," item 3, below.

3(e) Pollution Prevention, Re-use, and Recycling. Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles. These include the reduction of wastes at the source, re-use of materials, and recycling of all solid wastes generated. Generation of hazardous wastes should be minimized, and hazardous wastes must be handled appropriately. Again, see "Regulatory and Coordination Needs," item 3, below.

4. Natural Heritage Resources. The Draft PEIS addresses natural heritage resources, in its discussions of environmental consequences for biological resources (pages 4-18 to 4-27 (file pages 188-197), sections 4.5 to 4.5.5.) and wildfires (pages 4-42 to 4-46 (file pages 212-216), sections 4.7 through 4.7.5.). These discussions also pertain to wildlife and forestry resources (see items 5 and 6, below).

6

11 – Virginia Department of Environmental Quality (cont.)

4(a) Agency Jurisdictions. The mission of the Virginia Department of Conservation and Recreation (DCR) is to conserve Virginia's natural and recreational resources. The DCR-Natural Heritage Program's (DCR-DNH) mission is conserving Virginia's biodiversity through inventory, protection, and stewardship. The Virginia Natural Area Preserves Act (Virginia Code sections 10.1-209 through 10.1-217) codifies DCR's powers and duties related to statewide biological inventory: maintaining a statewide database for conservation planning and project review, land protection for the conservation of biodiversity, and the protection and ecological management of natural heritage resources (see item 4(b), below).

4(b) Definition. "Natural heritage resources" are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

11-5 ***4(c) Potential Plant Species for EHEC Use.*** DCR notes that the *Miscanthus* genus is being considered as a perennial herbaceous energy crop for the Engineered High-Energy Crop program (see Draft PEIS, page 1-3, Table 1.1-1, "Examples of Plants with the Potential to be EHECs"). The species is in the horticultural trade. The grass is a logical choice for energy production as it is highly combustible. However, DCR notes that large stands of *Miscanthus* increase fire risk.

11-6 ***4(d) Invasive Species Concern.*** *Miscanthus sinensis* currently has an invasive ranking of Medium on the DCR invasive plant list, (http://www.dcr.virginia.gov/natural_heritage/documents/nh-invasive-plant-list-2014.pdf). It is recognized as invasive by natural resource agencies in Maryland, West Virginia, North Carolina, Kentucky, Tennessee, and Virginia. The U.S. Fish and Wildlife Service, National Park Service, and the U.S. Department of Agriculture also consider this species invasive. Seeds of the plant are wind-dispersed. If *Miscanthus* were to be planted in large acreages as a crop, there is a potential of greatly increasing naturalized occurrences within Virginia, which may give rise to invasive populations. Naturalized occurrences have been seen creating large monotypic stands in power line rights-of-way.

4(e) Recommendation. For the above reasons, and because invasive species constitute the second largest threat to natural heritage resources, DCR recommends that DOE and its contractors avoid utilizing species that are listed on the DCR invasive plant list as engineered high-energy crops.

5. Wildlife Resources. See item 4, above.

5(a) Agency Jurisdiction. The Department of Game and Inland Fisheries, as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state- or federally-listed endangered or threatened species, but excluding listed insects (Virginia Code Title 29.1). The DGIF is a consulting agency under the U.S. Fish and Wildlife Coordination Act (16 U.S.C. sections 661 *et seq.*) and provides environmental

7

DOE Response

11-5: Section 4.7 has been revised to include the potential risk of fire from fields of Miscanthus with the need for appropriate BMPs as designated under the authority of the USDA APHIS.

11-6: DOE reviewed the concerns over potential invasiveness. Section 4.5 has been revised to identify that given the size of the field trials for Alternatives 2 and 3, the potential for invasiveness could be minor to moderate adverse impacts. Future site- and plant-specific environmental reviews, such as NEPA reviews, would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental review would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

11 – Virginia Department of Environmental Quality (cont.)

analysis of projects or permit applications coordinated through DEQ and several other state and federal agencies. DGIF determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts.

11-7

5(b) Listed Species. The Department of Game and Inland Fisheries includes its current list of Virginia listed species (attached comments) and recommends that DOE fully consider possible impacts upon any of these species, particularly if the research requires conversion of habitat from naturally vegetated to agricultural/row crop in nature.

5(c) Opportunity for Review. DGIF would like the opportunity to review any sites designated within Virginia for the EHEC program, to ensure protection of listed species and designated resources under the Department's jurisdiction. See "Regulatory and Coordination Needs," item 4, below.

6. Forest Resources. See item 4, above.

6(a) Agency Jurisdiction. The Department of Forestry (DOF) reviews applications to ensure that the forest resources of the Commonwealth are managed in a sustainable manner to meet the economic, ecological, and social needs of Virginia in perpetuity. DOF is charged, pursuant to Virginia Code sections 10.1-1101, 10.1-1105, and 10.1-1106 with protecting and developing healthy, sustainable forest resources that maintain functioning forest ecosystem and improve forest health, sustaining the supply of raw materials necessary for the economic growth of Virginia's timber industry, and supporting the protection of water quality and sources of water supply within Virginia's watersheds.

6(b) Scope of Coverage. The Department of Forestry observes that the Draft PEIS addresses concerns on an eco-region level and provides a caveat to its findings by noting that actual future field test project sponsors will be required to secure permits, as necessary. As such, it is not possible to evaluate the Draft PEIS with regard to actual forest loss or impact at this time. However, DOF offers general comments pertaining to the focus on loblolly pines that should be seriously considered as the program moves forward (item 6(c), next).

6(c) General Comments.

11-8

6(c)(i) Fire Management/Risk. The target areas in Virginia for the EHEC program appear, based on the maps provided, to be centered on the mountain region of the state. This region contains large areas of continuous forestland and also serves as the headwaters for Virginia's major rivers. Greatly increasing the turpene level within loblolly pines (turpene is a chemical used in turpentine, commonly found in pine sap (Ellis, Evans, 3/9/15)) will also make them more combustible, thereby increasing wildfire risk and potential adverse ecological and economic impacts. It will be very important that forestry best management practices are followed.

8

DOE Response

11-7: Section 4.5 has been revised to expand on the need for future site- and plant-specific environmental reviews, including NEPA reviews, to determine the present of listed species or critical habitats. In addition, surveys of the project area may be warranted to identify the potential of listed species or habitats on an individual parcel of land proposed as a field trial location. If the proposed EHEC could affect a protected species, consultation with USFWS and the appropriate State Fish and Wildlife agencies would be conducted to determine overall effects and potential mitigation measures.

11-8: Future site- and plant-specific environmental documentation will identify potential field trial locations to help determine the potential for wildfire risk for the proposed EHECs. It is anticipated that the project-specific environmental reviews would provide information on wildfire potential, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. DOE may require other site- and plant-specific BMPs.

11 – Virginia Department of Environmental Quality (cont.)

DOE Response

11-9

6(c)(ii) Invasive Species. If the seeds from the altered plant carry the alteration, and those seeds are dispersed naturally, DOE should consider the question: what are the potential wildfire consequences of high turpene-level trees existing outside of controlled areas?

6(c)(iii) Re-forestation of Riparian Buffers. The Draft PEIS refers to the Conservation Reserve Enhancement Program (CREP) and infers that the program may provide greater economic incentives to landowners to plant and maintain forested riparian buffers. The specifics of this reference are vague but bear some study as a possible new tool Virginia could use to help meet its Chesapeake Bay forested riparian buffer (FRB) goals.

REGULATORY AND COORDINATION NEEDS

1. Air Pollution Control.

1(a) Coordination. Questions regarding air pollution control, including applicability and processing of permits, should be directed to the appropriate DEQ Regional Office, depending on the location of the activity contemplated in the implementation of the proposed program. To find the appropriate office and regional air quality personnel, please visit DEQ's web site, http://www.deq.virginia.gov and choose "locations" along the top of the page. Then select among the six locations on the left side. Each of these will provide the name and telephone number of the regional air permit manager.

1(b) Authorities. Authorities for DEQ's air pollution control governance include, but are not limited to, the State Air Pollution Control Law (Virginia Code sections 10.1-1300 *et seq.*) and the following provisions of the *Regulations for the Control and Abatement of Air Pollution*:

11-10

- Open burning: 9 VAC 5-130 *et seq.*
- Fugitive dust control: 9 VAC 5-50-60 *et seq.*
- Permits for fuel-burning equipment: 9 VAC 5-80-1100 *et seq.*

2. Wetlands and Water Quality.

2(a) Coordination. In the event wetland and/or stream impacts might result from program activities, DOE or its grantees or contractors must contact DEQ's Office of Wetland and Stream Protection (begin with Dave Davis, telephone 804-698-4105 or e-mail (Dave.Davis@deq.virginia.gov). Similarly, DOE or its grantees or contractors should contact the Norfolk District, Army Corps of Engineers (begin with Tom Walker, telephone (757) 201-7657), to inquire about the applicability of a Section 404 permit under the Clean Water Act.

2(b) Authorities. As indicated above ("Environmental Impacts and Mitigation," items 2(a) through 2(c)), legal and regulatory authorities for state and federal water permitting requirements include, but are not limited to, the following:

9

11-9: GE strategies have been developed to prevent gene flow from plantations to natural forests, which could mitigate escape. Regardless, each transgenic event would be assessed on a site- and plant-specific basis through applicable regulatory mechanisms for potential negative impacts. Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

11-10: Recipients seeking funding or permits from DOE or another Federal agency for proposed EHEC Programs would be required to comply with all applicable laws and regulations, and to coordinate with Federal and State agencies with jurisdiction.

11 – Virginia Department of Environmental Quality (cont.) | **DOE Response**

- Clean Water Act, sections 401, 404;
- Section 404(b)(i)Guidelines Mitigation Memorandum of Agreement, dated February 1990;
- State Water Control Law, Virginia Code section 62.1-44.15:5D; and
- State Water Control *Regulations*, 9 VAC 25-210-10.

3. Solid and Hazardous Waste Management.

3(a) Coordination.

3(a)(i) General Questions. General questions about waste management in Virginia should be directed to DEQ's Division of Land Protection and Revitalization (Steve Coe, telephone (804) 698-4029 or e-mail steve.coe@deq.virginia.gov).

11-10

3(a)(ii) Questions on Waste Management Facilities. Questions about locations of waste management facilities may be directed to the appropriate DEQ Regional Office, depending on the location of the activity contemplated in the implementation of the proposed program. To find the appropriate office and regional air quality personnel, please visit DEQ's web site, http://www.deq.virginia.gov and choose "locations" along the top of the page. Then select among the six locations on the left side. Each of these will provide the name and telephone number of the regional waste manager.

3(a)(iii) Questions on Asbestos and/or Lead-based Paints. Begin with the waste management contacts in the DEQ Regional Offices (see item 3(a)(ii), preceding item). The additional state requirements for asbestos and/or lead-based paints are indicated in the listing of state authorities for waste management, item 3(b), next.

3(b) Authorities. Legal and regulatory authorities for DEQ's waste management activities include, but are not limited to, the following:

Virginia:

- Virginia Waste Management Act, Virginia Code sections 10.1-1400 *et seq.*
- *Virginia Solid Waste Management Regulations*, 9 VAC 20-81
  - (9 VAC 20-81-620 applies to **asbestos-containing materials**)
- *Virginia Hazardous Waste Management Regulations*, 9 VAC 20-60
  - (9 VAC 20-60-261 applies to **lead-based paints**)
- *Virginia Regulations for the Transportation of Hazardous Materials*, 9 VAC 20-110.

Federal:

- Resource Conservation and Recovery Act (RCRA), 42 U.S. Code sections 6901 *et seq.*

10

11 – Virginia Department of Environmental Quality (cont.) | **DOE Response**

- U.S. Department of Transportation *Rules for Transportation of Hazardous Materials*, 49 *Code of Federal Regulations*, Part 107
- Applicable rules contained in Title 40, *Code of Federal Regulations*.

4. Wildlife Resources.

11-10 ***4(a) Coordination.*** As indicated above ("Environmental Impacts and Mitigation," item 5(c)), the Department of Game and Inland Fisheries would like the opportunity to review any sites designated within Virginia for the EHEC program, so as to ensure protection for listed species (see enclosed list). In this regard, DOE or its agents may contact DGIF (begin with Amy Ewing, telephone (804) 367-2211 or e-mail amy.ewing@dgif.virginia.gov).

4(b) Authorities. Authorities for DGIF management of threatened and endangered wildlife species include, but are not limited to, Virginia Code Title 29.1, sections 29.1-563 through 29.1-570. See also the federal Fish and Wildlife Coordination Act, 16 U.S.Code sections 661 *et seq.*

Thank you for the opportunity to review the Draft PEIS for this program. If you have questions, please feel free to contact me (telephone (804) 698-4204 or e-mail bettina.sullivan@deq.virginia.gov) or Charles Ellis of this Office (telephone (804) 698-4195 or e-mail charles.ellis@deq.virginia.gov).

Sincerely,

Bettina Sullivan, Program Manager
Environmental Impact Review and
Long-Range Priorities

ec: Kotur S. Narasimhan, DEQ-DAPC
G. Stephen Coe, DEQ-DLPR
Amy M. Ewing, DGIF
Roberta D. Rhur, DCR
Christopher Egghart, DEQ-OWSP
Gregory Evans, DOF
Keith R. Tignor, VDACS

11

11 – Virginia Department of Environmental Quality (cont.)

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: Charles H. Ellis III **DEQ - OEIA PROJECT NUMBER: 15 – 007F**

PROJECT TYPE: ☐ STATE EA / EIR **X FEDERAL EA / EIS** ☐ SCC

☐ CONSISTENCY DETERMINATION

PROJECT TITLE: ENGINEERED HIGH ENERGY CROP PROGRAMS, SOUTHEASTERN STATES

PROJECT SPONSOR: DEPARTMENT OF ENERGY

PROJECT LOCATION: **X OZONE NONATTAINMENT/MAINTENANCE AND EMISSION CONTROL AREA FOR NOX & VOC (PARTLY)**

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO: ☐ CONSTRUCTION
X OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-45-780 et seq. – Asphalt Paving operations
4. **X 9 VAC 5-130 et seq. – Open Burning**
5. **X 9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
9. ☐ 9 VAC 5-80-1100 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to _____

COMMENTS SPECIFIC TO THE PROJECT:

In case projects are undertaken in ozone non-attainment/maintenance, All precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_X).

K s. Narasimhan

(Kotur S. Narasimhan)
Office of Air Data Analysis

DATE: January 29, 2015

DOE Response

See 11-2 response (repeated comment)

11 – Virginia Department of Environmental Quality (cont.)

From: Egghart, Christopher (DEQ)
Sent: Monday, February 09, 2015 3:34 PM
To: Ellis, Charles (DEQ)
Subject: DEQ Office of Wetlands and Stream Protection Comments on Draft PEIS Engineered High Energy Crops

Charlie,

I have reviewed the section of the DOE Engineered High Energy Crop Programs Draft PEIS relevant to the functional responsibility of the DEQ Office of Wetlands and Stream Protection and can offer the following comments.

Section 3.11.3 Floodplains and Wetlands pg. 3–105 fourth para second sentence reads " . . . . to determine if jurisdictional wetlands would be impacted and to establish appropriate mitigation to minimize adverse impacts."

The DOE should be aware that in order to comply with applicable federal and state laws, potential wetlands impacts should first be *avoided* in any planning process and subsequent, unavoidable impacts, *minimized*. Unavoidable impacts would then have to *mitigated* through compensatory offsets.

Should wetland impacts, including temporary impacts be called for, with these impacts falling outside of existing agricultural exemptions then a permit from the US Army Corps of Engineers and the Virginia Department of Environmental Quality Office of Wetland and Stream Protection would likely be required. Such permit would mandate appropriate compensatory mitigation for unavoidable stream and wetland impacts.

Thanks,

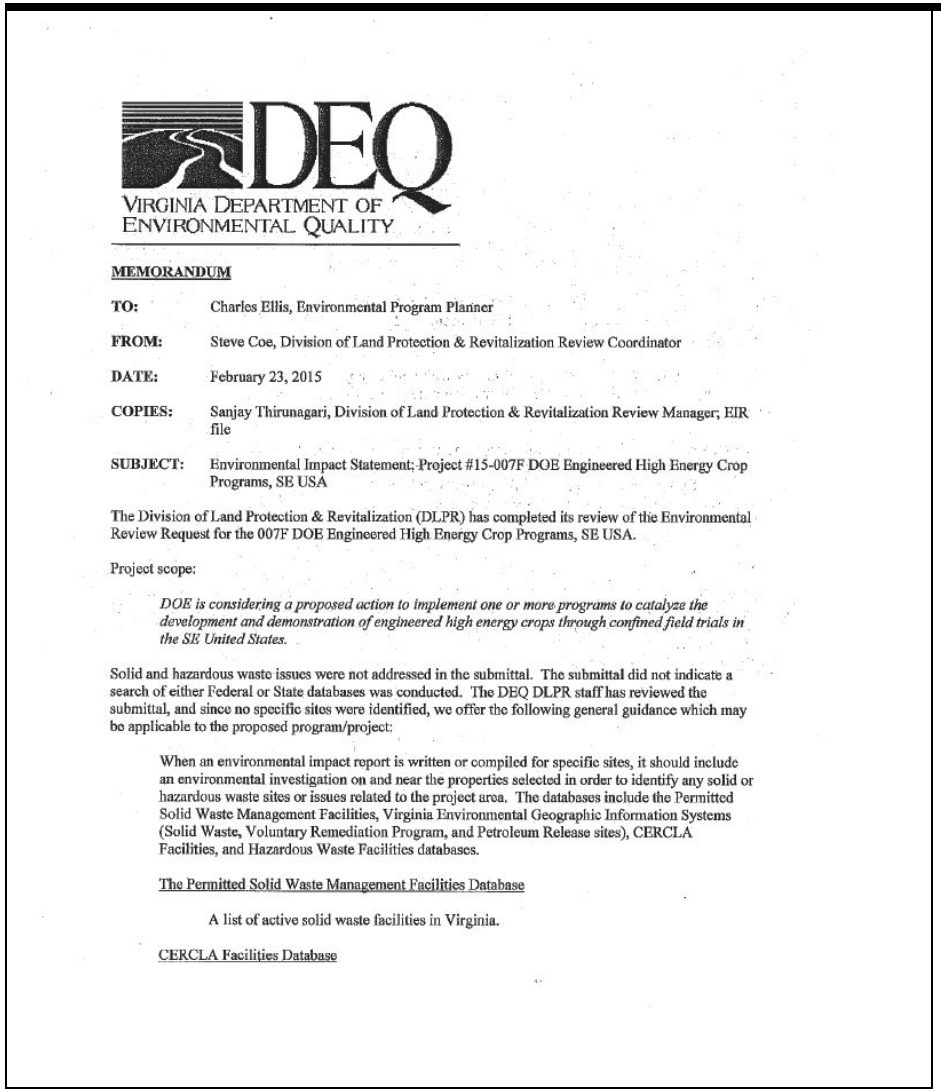
Chris Egghart
Cultural Resources Specialist
Department of Environmental Quality
629 E Main Street Richmond VA 23219
christopher.egghart@deq.virginia.gov
804-698-4377

DOE Response

See 11-3 response (repeated comment)

11 – Virginia Department of Environmental Quality (cont.)

DOE Response



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

MEMORANDUM

TO: Charles Ellis, Environmental Program Planner

FROM: Steve Coe, Division of Land Protection & Revitalization Review Coordinator

DATE: February 23, 2015

COPIES: Sanjay Thirunagari, Division of Land Protection & Revitalization Review Manager; EIR file

SUBJECT: Environmental Impact Statement; Project #15-007F DOE Engineered High Energy Crop Programs, SE USA

The Division of Land Protection & Revitalization (DLPR) has completed its review of the Environmental Review Request for the 007F DOE Engineered High Energy Crop Programs, SE USA.

Project scope:

DOE is considering a proposed action to implement one or more programs to catalyze the development and demonstration of engineered high energy crops through confined field trials in the SE United States.

Solid and hazardous waste issues were not addressed in the submittal. The submittal did not indicate a search of either Federal or State databases was conducted. The DEQ DLPR staff has reviewed the submittal, and since no specific sites were identified, we offer the following general guidance which may be applicable to the proposed program/project:

When an environmental impact report is written or compiled for specific sites, it should include an environmental investigation on and near the properties selected in order to identify any solid or hazardous waste sites or issues related to the project area. The databases include the Permitted Solid Waste Management Facilities, Virginia Environmental Geographic Information Systems (Solid Waste, Voluntary Remediation Program, and Petroleum Release sites), CERCLA Facilities, and Hazardous Waste Facilities databases.

The Permitted Solid Waste Management Facilities Database

A list of active solid waste facilities in Virginia.

CERCLA Facilities Database

See 11-4 response (repeated comment)

11 – Virginia Department of Environmental Quality (cont.) | **DOE Response**

A list of active and archived CERCLA (EPA Superfund Program) sites.

Hazardous Waste Facilities Database

A list of hazardous waste generators, hazardous waste transporters, and hazardous waste storage and disposal facilities. Data for the CERCLA Facilities and Hazardous Waste Facilities databases are periodically downloaded by the Waste Division from U.S. EPA's website.

Virginia Environmental Geographic Information Systems (VEGIS)

The "What's in My Backyard" application displays cross-media geographical features in proximity to a selected site/address for different facility search parameters.

Accessing the DEQ Databases:

The report author should access this information on the DEQ website at

http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/ReportsPublications/OriginalReports.aspx.

Scroll down to the databases which are listed under **Real Estate Search Information** heading.

Initially, the ***solid waste information*** can be accessed by clicking on the Permitted Solid Waste Management Facilities link and opening the file. You can search by city/county or region (zip code) for active permitted waste facilities. (Note: A targeted solid waste facility search can be accomplished through the **VEGIS** link - see information below re: VRP search).

The ***Superfund information*** will be listed by clicking on the Search EPA's CERCLIS database tab and clicking on the **Search Superfund Site Information** button (blue box). On this form, enter either 1) the zip code for the project site, or, 2) the name of the city or county and select Virginia in the State drop down box. Click "Search" at the bottom of the form. A facilities list will be appear.

The ***hazardous waste*** information can be accessed by clicking on the Hazardous Waste Facilities link. Go to the Geography Search section and fill in the 1) zip code of the project, or 2) the name of the city or county and VA in the state block, and click on "Search". The hazardous waste facilities in the locality will be listed.

The ***Voluntary Remediation Program*** (VRP), **Solid Waste Facilities**, and **Petroleum Release Sites** GPS databases can be accessed from the www.deq.virginia.gov website by clicking on **VEGIS** link under the **Resources & Tools** category. Then click on the "What's in my backyard" in the **Mapping Applications** block to the left. On the web map page, click on the "Pick a Quick Search Here" drop down arrow, and select "Address Search". In the adjacent block enter the zip code or address for the project site. Click on "Search". On the map you will see a green "balloon" indicating the site.

On the map area click on the "Tools" drop down arrow, and the select "Identify". A normal search looks like this: In the "Radius" block, type in [.5], and in the adjacent block select [miles] from the drop down options. Click on the "Layer" drop down arrow, select "VRP Sites", and then click on the green balloon. All VRP sites within the indicated range will appear in the Map/Results block to the left. Clicking on the block by the identified site will result in a second green balloon on the map. With multiple sites identified by the search, you can select/unselect each site to visualize its location, or change the radius of the search as needed.

11 – Virginia Department of Environmental Quality | **DOE Response**

At this time you can also search for "Solid Waste" sites and "Petroleum Releases" information for the project area by selecting these topics from the "Layer" options and then clicking on the green balloon on the map after each selection.

These database searches will include most waste-related site information for each locality based upon the radius of the address selected (such as 100 feet, 500 feet, etc.). In many cases, especially when the project is located in an urban area, the database output for that locality will be extensive. This information is important to identify possible environmental concerns that may impact a new project.

Please note that the DEQ's Petroleum Contamination (PC) case should be evaluated by the project engineer or manager to establish the exact location of the release and the nature and extent of the petroleum release and the potential to impact the proposed project. The facility representative should contact the DEQ's Regional Office at (Tanks Program) for further information and the administrative records of the PC cases which are in close proximity to the proposed project sites in Virginia.

GENERAL COMMENTS

Soil, Sediment, and Waste Management

Any soil that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-81); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Part 107.

Asbestos and/or Lead-based Paint

All structures being demolished/renovated/removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP are found, in addition to the federal waste-related regulations mentioned above, State regulations 9VAC 20-81-620 for ACM and 9VAC 20-60-261 for LBP must be followed. For questions contact DEQ's Regional Office.

Pollution Prevention – Reuse - Recycling

Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

If you have any questions or need further information, please contact Steve Coe at (804) 698-4029.

11 – Virginia Department of Environmental Quality (cont.)

DOE Response

Molly Joseph Ward
Secretary of Natural Resources

Clyde E. Cristman
Director

Joe Elton
Deputy Director of Operations

Rochelle Altholz
Deputy Director of Administration and Finance

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

600 East Main Street, 24th Floor
Richmond, Virginia 23219
(804)786-6124

MEMORANDUM

DATE: February 24, 2015

TO: Charlie Ellis, DEQ

FROM: Roberta Rhur, Environmental Impact Review Coordinator

SUBJECT: DEQ 15-007F, DOE, Engineered High Energy Crop Programs, Southeastern States

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage's (DCR) mission is conserving Virginia's biodiversity through inventory, protection, and stewardship. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

DCR has reviewed the draft Program Environmental Impact Statement (PEIS) for the Department of Energy to develop and implement programs to research, develop and demonstrate engineered high energy crops (EHECs) through confined field trials in the Southeastern United States. According to the Table 1.1-1: Examples of Plants with the Potential to be EHECs on page 1-3, the *Miscanthus* genus is being considered as a perennial herbaceous energy crop.

Miscanthus sinensis currently has an I-rank of Medium on the DCR invasive plant list (http://www.dcr.virginia.gov/natural_heritage/documents/nh-invasive-plant-list-2014.pdf). The species is in the horticultural trade. Field staff are seeing it naturalized more frequently in recent years. It is recognized as invasive by natural resource agencies in MD, WV, NC, KY, TN, and Virginia. The U.S. Fish and Wildlife Service, National Park Service, and USDA also consider this species invasive.

The seed are wind dispersed. If *Miscanthus* were to be planted in large acreages as a crop, there is a potential of greatly increasing naturalized occurrences within Virginia, which may give rise to invasive populations. Naturalized occurrences have been seen creating large monotypic stands in power line right-of-ways. The grass is a logical choice for energy production: it is highly combustible. Large stands of *Miscanthus* increase fire risk.

Invasive species is the second largest threat to natural heritage resources. DCR recommends avoid utilizing species on the DCR invasive plant list as engineered high energy crops.

See 11-5 response (repeated comment)

11 – Virginia Department of Environmental Quality (cont.)	DOE Response
The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.	

11 – Virginia Department of Environmental Quality (cont.)

DOE Response

From: Ewing, Amy (DGIF)
Sent: Tuesday, February 24, 2015 4:29 PM
To: Ellis, Charles (DEQ)
Cc: Cason, Gladys (DGIF)
Subject: ESSLog# 33976_15-007F_DOW High Energy Crop Programs

Charlie,
We have no comments on this program other than to say that we would like the opportunity to review any sites designated within Virginia to ensure protection of listed species and designated resources under our jurisdiction. Also, we offer our current list of listed species in Virginia and recommend that they fully consider possible impacts upon any of these species, particularly if the research requires conversion of habitat from naturally vegetated to agricultural/row crop in nature.

Thanks, Amy

Amy Ewing ☯ Environmental Services Biologist/FWIS Manager ☯ VA Dept. of Game and Inland Fisheries ☯ 4010 West Broad St. Richmond, VA 23230 ☯ 804-367-2211 ☯ www.dgif.virginia.gov

11 – Virginia Department of Environmental Quality (cont.) | **DOE Response**

Virginia Department of Game and Inland Fisheries

Special Legal Status Faunal Species in Virginia

Common Name	Scientific Name	Federal[1]	State	WAP Tier
FRESHWATER FISHES				
Atlantic sturgeon	*Acipenser oxyrinchus*	FE	SE	II
Blackbanded sunfish	*Enneacanthus chaetodon*		SE	I
Blackside dace	*Chrosomus (=Phoxinus) cumberlandensis*	FT	ST	III
Carolina darter	*Etheostoma collis*		ST	II
Duskytail darter	*Etheostoma percnurum*	FE	SE	I
Emerald shiner	*Notropis atherinoides*		ST	III
Golden darter	*Etheostoma denoncourti*	SOC	ST	
Greenfin darter	*Etheostoma chlorobranchium*		ST	II
Orangefin madtom	*Noturus gilbert*	SOC	ST	II
Paddlefish	*Polyodon spathula*		ST	II
Roanoke logperch	*Percina rex*	FE	SE	I
Sharphead darter	*Etheostoma acuticeps*		SE	I
Shortnose sturgeon	*Acipenser brevirostrum*	FE	SE	I
Sickle darter	*Percina williamsi*		ST	II
Slender chub	*Erimystax cahni*	FT	ST	I
Spotfin chub	*Erimonax monachus*	FT	ST	I
Steelcolor shiner	*Cyprinella whippiei*		ST	III
Tennessee dace	*Chrosomus (=Phoxinus) tennesseensis*		SE	I
Variegate darter	*Etheostoma variatum*		SE	II
Western sand darter	*Ammocrypta clara*		ST	II
Whitemouth shiner	*Notropis alborus*		ST	IV
Yellowfin madtom	*Noturus flavipinnis*	FT	ST	I
AMPHIBIANS				
	Frogs			
Barking treefrog	*Hyla gratiosa*		ST	II
	Salamanders			
Eastern tiger salamander	*Ambystoma tigrinum*		SE	II
Mabee's salamander	*Ambystoma mabeei*		ST	II
Shenandoah salamander	*Plethodon shenandoah*	FE	SE	I
REPTILES				
	Lizards			
Eastern glass lizard	*Ophisaurus ventralis*		ST	II
	Snakes			
Canebrake rattlesnake (Coastal Plain population of timber rattlesnake)	*Crotalus horridus*		SE	II
	Turtles			
Bog (= Muhlenberg) turtle	*Glyptemys (=Clemmys) muhlenbergii*	FT(S/A)	SE	I
Eastern chicken turtle	*Deirochelys reticularia reticularia*		SE	I
Green sea turtle	*Chelonia mydas*	FT	ST	
Hawksbill sea turtle	*Eretmochelys imbricata*	FE	SE	

[1] FE=Federal Endangered; FT=Federal Threatened; S/A=Similarity of Appearance; FC=Federal Candidate; FP=Federal Proposed; SOC=Federal Species of Concern (not a legal status; list maintained by USFWS Virginia Field Office); SE=State Endangered; ST=State Threatened; WAP Tier = Virginia Wildlife Action Plan Tiered Species, from the Species of Greatest Conservation Need list that is defined in the plan: Tiers I-IV (not a legal status, Tier levels defined in the Virginia Wildlife Action Plan).

07/18/14 shw

1

11 – Virginia Department of Environmental Quality (cont.) | **DOE Response**

Virginia Department of Game and Inland Fisheries

Special Legal Status Faunal Species in Virginia

Common Name	Scientific Name	Federal[1]	State	WAP Tier
Kemp's ridley sea turtle	*Lepidochelys kempii*	FE	SE	
Leatherback sea turtle	*Dermochelys coriacea*	FE	SE	
Loggerhead sea turtle	*Caretta caretta*	FT	ST	I
Wood turtle	*Glyptemys insculpta*		ST	I
BIRDS				
Bachman's sparrow	*Aimophila aestivalis*		ST	I
Bachman's warbler (=wood)	*Vermivora bachmanii*	FE	SE	
Bewick's wren	*Thryomanes bewickii*		SE	I
Black rail	*Laterallus jamaicensis*		SE	I
Gull-billed tern	*Sterna nilotica*		ST	I
Henslow's sparrow	*Ammodramus henslowii*		ST	I
Kirtland's warbler (=wood)	*Dendroica kirtlandii*	FE	SE	IV
Loggerhead shrike	*Lanius ludovicianus*		ST	I
Peregrine falcon	*Falco peregrinus*		ST	I
Piping plover	*Charadrius melodus*	FT	ST	I
Red-cockaded woodpecker	*Picoides borealis*	FE	SE	I
Red knot	*Calidris canutus*	FP		IV
Roseate tern	*Sterna dougallii dougallii*	FE	SE	IV
Upland sandpiper	*Bartramia longicauda*		ST	I
Wilson's plover	*Charadrius wilsonia*		SE	I
MAMMALS				
American water shrew	*Sorex palustris*		SE	II
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	FE	SE	I
Delmarva Peninsula fox squirrel	*Sciurus niger cinereus*	FE	SE	II
Dismal Swamp southeastern shrew	*Sorex longirostris fisheri*		ST	IV
Eastern puma (=cougar)	*Puma (=Felis) concolor cougar*	FE	SE	
Gray bat	*Myotis grisescens*	FE	SE	II
Gray wolf	*Canis lupus*	FE	SE	
Indiana bat	*Myotis sodalis*	FE	SE	I
Northern long-eared bat	*Myotis septentrionalis*	FP		
Rafinesque's eastern big-eared bat	*Corynorhinus rafinesquii macrotis*		SE	I
Rock vole	*Microtus chrotorrhinus*		SE	II
Snowshoe hare	*Lepus americanus*		SE	I
Virginia big-eared bat	*Corynorhinus (=Plecotus) townsendii virginianus*	FE	SE	II
Virginia northern flying squirrel	*Glaucomys sabrinus fuscus*	FE	SE	I
MOLLUSKS				
	Freshwater Mussels			
Appalachian monkeyface (pearlymussel)	*Quadrula sparsa*	FE	SE	I
Atlantic pigtoe	*Fusconaia masoni*	SOC	ST	II
Birdwing pearlymussel	*Lemiox rimosus*	FE	SE	I
Black sandshell	*Ligumia recta*		ST	III
Brook floater	*Alasmidonta varicosa*		SE	II
Cracking pearlymussel	*Hemistena lata*	FE	SE	I
Cumberland bean (pearlymussel)	*Villosa trabalis*	FE	SE	I
Cumberland monkeyface (pearlymussel)	*Quadrula intermedia*	FE	SE	I

[1] FE=Federal Endangered; FT=Federal Threatened; S/A=Similarity of Appearance; FC=Federal Candidate; FP=Federal Proposed; SOC=Federal Species of Concern (not a legal status; list maintained by USFWS Virginia Field Office); SE=State Endangered; ST=State Threatened; WAP Tier = Virginia Wildlife Action Plan Tiered Species, from the Species of Greatest Conservation Need list that is defined in the plan: Tiers I-IV (not a legal status, Tier levels defined in the Virginia Wildlife Action Plan).

07/18/14 shw

2

11 – Virginia Department of Environmental Quality (cont.)

DOE Response

Virginia Department of Game and Inland Fisheries

Special Legal Status Faunal Species in Virginia

Common Name	Scientific Name	Federal[1]	State	WAP Tier
Cumberlandian combshell	*Epioblasma brevidens*	FE	SE	I
Deertoe	*Truncilla truncata*		SE	IV
Dromedary pearlymussel	*Dromus dromas*	FE	SE	I
Dwarf wedgemussel	*Alasmidonta heterodon*	FE	SE	II
Elephantear	*Elliptio crassidens*		SE	IV
Fanshell	*Cyprogenia stegaria*	FE	SE	I
Finerayed pigtoe	*Fusconaia cuneolus*	FE	SE	I
Fluted kidneyshell	*Ptychobranchus subtentum*	FE	SE	II
Fragile papershell	*Leptodea fragilis*		ST	IV
Green blossom (pearlymussel)	*Epioblasma torulosa gubernaculum*	FE	SE	I
Green floater	*Lasmigona subviridis*		ST	II
James spinymussel	*Pleurobema collina*	FE	SE	I
Littlewing pearlymussel	*Pegias fabula*	FE	SE	I
Ohio pigtoe	*Pleurobema cordatum*		SE	III
Oyster mussel	*Epioblasma capsaeformis*	FE	SE	I
Pimpleback	*Quadrula pustulosa pustulosa*		ST	IV
Pink mucket (pearlymussel)	*Lampsilis abrupta*	FE	SE	I
Pistolgrip	*Tritogonia verrucosa*		ST	IV
Purple bean	*Villosa perpurpurea*	FE	SE	I
Purple lilliput	*Toxolasma lividus*	SOC	SE	II
Pyramid pigtoe	*Pleurobema rubrum*	SOC	SE	II
Rayed bean	*Villosa fabalis*	FE	SE	II
Rough pigtoe	*Pleurobema plenum*	FE	SE	I
Rough rabbitsfoot	*Quadrula cylindrica strigillata*	FE	SE	I
Sheepnose	*Plethobasus cyphyus*	FE	SE	II
Shiny pigtoe	*Fusconaia cor*	FE	SE	I
Slabside pearlymussel	*Lexingtonia dolabelloides*	FE	SE	II
Slippershell mussel	*Alasmidonta viridis*		SE	II
Snuffbox	*Epioblasma triquetra*	FE	SE	II
Spectaclecase	*Cumberlandia monodonta*	FE	SE	II
Tan riffleshell	*Epioblasma florentina walkeri (=E. walkeri)*	FE	SE	I
Tennessee heelsplitter	*Lasmigona holstonia*		SE	II
	Freshwater & Land Snails			
Appalachian springsnail	*Fontigens bottimeri*	SOC	SE	II
Brown supercoil	*Paravitrea septadens*	SOC	ST	I
Rubble coil	*Helicodiscus lirellus*	SOC	SE	I
Shaggy coil	*Helicodiscus diadema*	SOC	SE	I
Spider elimia	*Elimia arachnoidea*		SE	II
Spiny riversnail	*Io fluvialis*	SOC	ST	III
Spirit supercoil	*Paravitrea hera*	SOC	SE	I
Springsnail (no common name)	*Fontigens morrisoni*	SOC	SE	I
Thankless ghostsnail	*Holsingeria unthanksensis*	SOC	SE	I
Virginia fringed mountain snail	*Polygyriscus virginianus*	FE	SE	I
FRESHWATER CRUSTACEANS				
Big Sandy crayfish	*Cambarus veteranus*	SOC	SE	II
Lee County Cave isopod	*Lirceus usdagalun*	FE	SE	I
Madison Cave amphipod	*Stygobromus stegerorum*	SOC	ST	I
Madison Cave isopod	*Antrolana lira*	FT	ST	II

[1] FE=Federal Endangered; FT=Federal Threatened; S/A=Similarity of Appearance; FC=Federal Candidate; FP=Federal Proposed; SOC=Federal Species of Concern (not a legal status; list maintained by USFWS Virginia Field Office); SE=State Endangered; ST=State Threatened; WAP Tier = Virginia Wildlife Action Plan Tiered Species, from the Species of Greatest Conservation Need list that is defined in the plan: Tiers I-IV (not a legal status, Tier levels defined in the Virginia Wildlife Action Plan).

07/18/14 shw

3

11 – Virginia Department of Environmental Quality (cont.)

DOE Response

Virginia Department of Game and Inland Fisheries

Special Legal Status Faunal Species in Virginia

Common Name	Scientific Name	Federal[1]	State	WAP Tier
MILLIPEDES				
Ellett Valley pseudotremia	*Pseudotremia cavernarum*	SOC	ST	II
Laurel Creek xystodesmid	*Sigmoria whiteheadi*	SOC	ST	I
ARACHNIDS				
Spruce-fir moss spider	*Microhexura montivaga*	FE	SE	
INSECTS[2]				
American burying beetle	*Nicrophorus americanus*	FE		I
Appalachian grizzled skipper	*Pyrgus wyandot (=Pyrgus centaureae wyandot)*	SOC	ST	I
Buffalo Mountain mealybug	*Puto kosztarabi*	SOC	SE	I
Holsinger's cave beetle	*Pseudanophthalmus holsingeri*	SOC	SE	I
Mitchell's satyr butterfly	*Neonympha mitchellii*	FE	SE	I
Northeastern beach tiger beetle	*Cicindela dorsalis dorsalis*	FT	ST	II
Virginia Piedmont water boatman	*Sigara depressa*	SOC	SE	I
MARINE MAMMALS				
Blue whale	*Balaenoptera musculus*	FE	SE	
Finback whale	*Balaenoptera physalus*	FE	SE	
Humpback whale	*Megaptera novaeangliae*	FE	SE	
North Atlantic Right whale	*Eubalaena glacialis*	FE	SE	
Sei whale	*Balaenoptera borealis*	FE	SE	
Sperm whale	*Physeter catodon (= macrocephalus)*	FE	SE	
West Indian manatee	*Trichechus manatus*	FE	SE	

[2] all insects listed as federal or state endangered or threatened are protected by regulations that fall under the Virginia Department of Agriculture and Consumer Services' jurisdiction

For further information or details regarding this list or any species listed herein, please contact:

Bureau of Wildlife Resources, Statewide Resources
Virginia Department of Game and Inland Fisheries
4010 W. Broad St.
Richmond, Virginia 23230
(804) 367-6913

[1] FE=Federal Endangered; FT=Federal Threatened; S/A=Similarity of Appearance; FC=Federal Candidate; FP=Federal Proposed; SOC=Federal Species of Concern (not a legal status; list maintained by USFWS Virginia Field Office); SE=State Endangered; ST=State Threatened; WAP Tier = Virginia Wildlife Action Plan Tiered Species, from the Species of Greatest Conservation Need list that is defined in the plan: Tiers I-IV (not a legal status, Tier levels defined in the Virginia Wildlife Action Plan).

07/18/14 ahw

4

11 – Virginia Department of Environmental Quality (cont.)

DOE Response

From: Evans, Gregory (DOF)
Sent: Tuesday, February 24, 2015 12:23 PM
To: Ellis, Charles (DEQ)
Subject: RE: NEW PROJECT DOE 15-007F

Charlie,

I have completed a desk review on behalf of the Department of Forestry of the draft PEIS for DOE's proposed Engineered High Energy Crop Programs. The draft PEIS at this point addresses concerns only on an eco-region level and caveats its findings by noting that actual future field test project sponsors will be required to secure permits as necessary. As such it is not possible to evaluate the PEIS with regard to actual forest loss or impact at this time.

However, DOF can offer some general comments pertaining to the focus on loblolly pines that should be seriously considered and accounted for as the program moves forward.

Fire management/risk: The target areas in Virginia for the DOE program appear, based on the maps provided, to be centered on the mountain region of the state. This region contains large areas of continuous forestland and also serves as the headwaters for Virginia's major rivers. Greatly increasing the turpene level within loblolly pines will also make them more combustible thereby increasing wildfire risk and potential adverse ecological and economic impacts. It will be very important that forestry best management practices are followed.

Invasive Species: I do not pretend to understand the specifics of crop engineering but if the seeds from the altered plant carry the alteration and those seeds are disbursed naturally what are the potential wild fire consequences of high turpene level trees existing outside of controlled areas?

Reforestation of Riparian Buffers: The draft PEIS references the CREP program and infers that the program may provide greater economic incentives to landowners to plant and maintain forested riparian buffers. The specifics are vague but bear some study as a possible new tool Virginia could use to help meet its Chesapeake Bay FRB goals.

This concludes DOF's comments.

Greg

Greg Evans
Mitigation Program Manager/
Chesapeake Bay Program Lead
Virginia Department of Forestry
900 Natural Resources Drive, Suite 800
Charlottesville, VA 22903
434.906.3658
gregory.evans@dof.virginia.gov
www.dof.virginia.gov

From: Fulcher, Valerie (DEQ)
Sent: Thursday, January 22, 2015 11:27 AM
To: dgif-ESS Projects (DGIF); Tignor, Keith (VDACS); Rhur, Robbie (DCR); odwreview (VDH); Coe, Stephen (DEQ); Narasimhan, Kotur (DEQ); Egghart, Christopher (DEQ); Kline, Everette (DOF); Evans, Gregory (DOF)
Cc: Ellis, Charles (DEQ)

See 11-6 and 11-8 responses (repeated comment)

11 – Virginia Department of Environmental Quality (cont.) | **DOE Response**

Subject: NEW PROJECT DOE 15-007F

Good morning - attached is a new EIR review request/ project:

DOE: Engineered High Energy Crop Programs,
Southeastern States, DEQ #15-007F

The document is available at www.deq.virginia.gov/fileshare/oeir under "DOE Engineered High Energy Crops Program".

The due date for comments is FEBRUARY 25, 2015. You can send your comments either directly to Charlie by email (Charles.Ellis@deq.virginia.gov), or you can send your comments by regular interagency/U.S. mail to the Department of Environmental Quality, Office of Environmental Impact Review, 629 E. Main St., 6th Floor, Richmond, VA 23219.

If you have any questions, please email Charlie.

Thanks!

Valerie

Valerie A. Fulcher, CAP-OM, Executive Secretary Sr.
Department of Environmental Quality
Environmental Enhancement - Office of Environmental Impact Review
629 E. Main St., 6th Floor
Richmond, VA 23219
804/698-4330
804/698-4319 (Fax)
email: Valerie.Fulcher@deq.virginia.gov
http://www.deq.virginia.gov/Programs/EnvironmentalImpactReview.aspx

11 – Virginia Department of Environmental Quality (cont.)

DOE Response

3/23/2015 Comments and Recommendations on the Draft Programmatic Environmental Impact Statement (DPEIS) for Engineered High Energy Crop Programs fo...

From: "Joyce Stanley" <joyce_stanley@ios.doi.gov>
Subject: Comments and Recommendations on the Draft Programmatic Environmental Impact Statement (DPEIS) for Engineered High Energy Crop Programs for the Southeastern United States - ER 15-0046
Date: Wed, March 11, 2015 12:14 pm
To: comments@engineeredhighenergycropspeis.com

Joyce A. Stanley, MPA

Regional Environmental Assistant

US Department of the Interior

Office of Environmental Policy and Compliance

(404) 331-4524 - Office

(404) 331-1736 - Fax

(404) 852-5414 - Mobile

joyce_stanley@ios.doi.gov

http://www.doi.gov/oepc/atlanta.html

Attachments:

untitled-[1.1.1].plain
Size: 0.3 k
Type: text/plain

image001.jpg
Size: 31 k
Type: image/jpeg

Engineered High Energy Crop Programs for the Southeastern United States - ER 15-0046.doc
Size: 201 k
Type: application/msword

https://box443.bluehost.com:2096/cpsess9461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=19... 1/1

12 – U.S. Department of the Interior

DOE Response

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Richard B. Russell Federal Building
75 Spring Street, S.W.,
Atlanta, Georgia 30303

ER 15/0046
9043.1

March 11, 2015

Jonathan Burbaum
Program Director
Advanced Research Projects Agency-Energy (ARPA-E)
U.S. Department of Energy
ATTN: EHEC PEIS
1000 Independence Avenue, S.W., Mailstop-950-8043
Washington, DC 20585

Re: Comments and Recommendations on the Draft Programmatic Environmental Impact Statement (DPEIS) for Engineered High Energy Crop Programs for the Southeastern United States

Dear: Mr. Burbaum:

12-1 The U.S. Department of the Interior (Department) has reviewed the DPEIS for Engineered High Energy Crop Programs for the Southeastern United States. The High Energy Crop Program is for the development and demonstration of engineered high energy crops (EHECs). These EHECs are agriculturally-viable photosynthetic species containing genetic material produced through biotechnology, interspecific hybridization, or other engineering processes. A main component of the proposed EHEC Programs is Federal funding for confined field trials to evaluate the performance of EHECs that will facilitate the commercial development and deployment of biofuels. Confined field trials may range in size and could include several scales: development scale (up to 5 acres), pilot scale (up to 250 acres), or demonstration scale (up to 15,000 acres). We offer the following comments.

General Comments

12-2 The DPEIS scope covers the entire Southeastern United States; however, throughout the DPEIS there are statements that the EHEC will have no effects to threatened or endangered species or critical habitat. This conclusion is presumptive as no specific project sites have been identified. We recommend DOE include a discussion about how it will implement a tiered approach to include additional Endangered Species Act (ESA) consultations on a site-specific basis.

12-1: Thank you for your comments.

12-2: Section 4.5 has been revised to expand on the need for future site- and plant-specific environmental reviews, including NEPA reviews, to determine the present of listed species or critical habitats. In addition, the PEIS identifies that surveys of the project area may be warranted to identify the potential of listed species or habitats on an individual parcel of land proposed as a field trial location. If the proposed EHEC could affect a protected species, consultation with USFWS could be conducted to determine overall impacts and potential mitigation measures.

12 – U.S. Department of the Interior (cont.)

Engineered High Energy Crop Programs for the Southeastern United States – ER 15-0046

12-3 We strongly recommend that any species on the International Union for the Conservation of Nature (IUCN) list of invasive species not be used for biofuels in the Southeastern US. We acknowledge that the proposed EHEC Program list of excluded crops includes those plants that the United States Department of Agriculture (USDA) has determined to be either a noxious weed or and invasive species, or has the potential to be invasive or noxious as determined by the Secretary of Agriculture in consultation with other Federal or state agencies. We also agree with the statement "It is the bio-geographical context of a given plant that is important in determining whether it may be invasive in a particular location." However, the examples of potential EHECs given in the document (i.e., Elephant Grass, Camelina, Jatropha, and Reed Canarygrass) are known invasive species in the southeast that are already requiring millions of dollars to control. In 2010, IUCN found that it is "Likely that the cost of an invasion by a biofuel feedstock or associated pest would, in the long run, outweigh any economic benefit offered by biofuel development." The IUCN list of invasive species provides a more comprehensive list of known invasive species.

12-4 The Department recognizes the EHEC proposed program would be limited to those areas that have been previously disturbed and are in existing agricultural space. However, the Department is concerned that depending on the success of the program it has the potential to result in the conversion of native forests and grasslands to EHECs. Therefore, we recommend a discussion of Department of Energy's commitment that if the program moves from demonstration scale to production scale all incentives and program eligibility would be limited to previously converted agricultural spaces.

12-5 Farm infrastructure and EHEC production should also emphasize reduction of water consumed; avoid and minimize the use of herbicides and pesticides whenever possible; and avoid the discharge of herbicide, pesticides, and nutrients into waters of the United States.

12-6 The Department is concerned that the same biological properties that make EHECs desirable for use as fuels may also make them preferred by wildlife as a food source. We recommend that you designate US Department of Agriculture Wildlife Services as lead agency tasked with the prevention of EHECs becoming ecological traps for fish and wildlife. Once EHEC grant recipients are identified, they should be encouraged to work with our Partners for Fish and Wildlife Program biologists to facilitate participation in candidate conservation and Habitat Conservation Plans for the conservation and recovery of threatened and endangered species, as appropriate.

12-7 The Department recommends that EHEC grant recipients should be encouraged to co-locate projects with other renewable energy projects whenever practical as co-locating sites can reduce the effects of these projects on fish and wildlife habitat.

12-8 We recommend expanding the effects analysis to include indirect and cumulative effects. The effects analysis in the DPEIS is limited to crop production and harvesting in the field trails. Effects associated with post-harvest activities, such as transportation effects and the emissions from burning of EHEC to produce energy, are not considered. The indirect or cumulative effects may vary depending on the scale of the project (5-acres versus 15,000-acres), on the surrounding habitats, water quality, water availability, migratory birds, and air quality.

Page 2

DOE Response

12-3: Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

12-4: The proposed EHEC Programs would be limited to previously converted agricultural spaces, no matter the Alternative chosen.

12-5: Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. This may include water, herbicide, and pesticide use and discharges.

12-6: DOE or another Federal agency proposing a Federal action related to an EHEC Program would be required to complete environmental reviews, such as NEPA reviews, for site- and plant-specific projects to identify concerns and required mitigation. DOE would work with agencies that have special expertise or jurisdiction by law for any proposed action. When EHEC projects are proposed, DOE would partner with the appropriate agencies to evaluate site- and plant-specific environmental impacts.

12-7: The siting of proposed EHECs would be reviewed in future site- and plant-specific environmental reviews.

12 – U.S. Department of the Interior (cont.)

Engineered High Energy Crop Programs for the Southeastern United States – ER 15-0046

12-9 The DPEIS does not evaluate multiple alternatives to the project. There is a Proposed Action (Section 2) and the No Action alternative. The Proposed Action does describe three different scales of field trials representing a very wide range of potential acreage effects. However, the DPEIS does not "rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated."

Specific Comments:

- **12-10** Page S-ix & 2-12, Tables S-2 and 2.5-1. "Summary of Potential Environmental Impacts by Alternative." In the Biological Resource category for each of these tables (which are duplicative), the DPEIS indicates that there will be no effects to threatened or endangered species or critical habitat. This conclusion is presumptive, as no project sites have been identified. Potential sites may be adjacent to streams with protected aquatic species, American wood stork rookeries, red-cockaded woodpecker habitat, or other mobile species. The project area may be adjacent to sensitive habitats, which may be affected by EHEC burning. We recommend that both of these tables be revised to state that effects to federally protected species or habitat must be determined during specific project development.
- **12-11** Page 2-7. We agree that fencing and gating of study sights should be sufficient to reasonably preclude exploitation of crop sites by wildlife. However, we recommend Best Management Practices (BMPs), to reduce sedimentation and/or water source contamination by herbicide, pesticides, and nutrients, also be included.
- **12-11** Page 2-12. "No impacts are anticipated to threatened and endangered species, critical habitat, or migratory birds through avoidance" is contradicted by potential indirect effects described afterwards in each section. Environmental review is not a BMP. Coordination with appropriate federal agencies tasked with administering wildlife laws and regulations should be explicitly stated.
- **12-12** Page 3-8. Authority or policy guidance for designating lands as ineligible for EHEC program should be cited in figure caption.
- **12-13** Page 4-19. Biological Resources Impact Summary table doesn't seem to take into consideration potential effects described throughout the previous pages of the chapter and could be contradicted by the description of potential effects on Page 4-20.
- **12-14** Page 4-21. The effects determination is appropriate at this scope of analysis, so long as tiered NEPA and ESA reviews will still be performed on a site-specific basis. This should be stated and reiterated throughout this section.
- **12-15** Page 4-21. States "If protected species were to enter the site, their presence would be fleeting as the habitat is either not suitable or does not contain constituent elements required by the species." This is untrue in the case of night jars and other birds, as well as bats which may be attracted to croplands during foraging or transit. Species use habitats for reasons other than sheltering.
- **12-16** Page 4-22. "Croplands may be used more frequently by reptiles and amphibians because the habitat structure provides more micro sites (i.e., sunning and shading spots)." If reptiles and amphibians are threatened or endangered the statement on page 4-21 may be contradicted by the statement here.

Page 3

DOE Response

12-8: Given the programmatic nature of the Proposed Action and large geographic area, this PEIS did not focus on the post-harvest activities, such as transportation to the refinery, refining into biofuels, and tail-pipe emissions. Further site- and plant-specific environmental compliance reviews would be conducted to identify potential impacts of the EHEC at proposed field trial locations and resulting from post-harvest activities and energy conversion activities tied to a specific EHEC project.

12-9: As the purpose and need for the Proposed Action for this project is to develop and implement one or more programs to catalyze the development and deployment of EHECs, DOE considered a range of confined field trial sizes (in acreage) to progress from the lab to demonstration size allowing for commercial production of an EHEC. The scale alternatives are illustrative, intended to provide environmental information regarding the range of potential impacts of the reasonable alternatives, and thus inform future consideration of EHEC Programs.

12-10: Tables S-2 and 2.5-1 were revised to reflect the need for future site- and plant-specific documentation to determine potential impacts to listed species and habitats. In addition, content was added to identify that consultation with USFWS/NMFS may be required.

12-11: Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. The project-specific environmental reviews would provide information on protected species and habitat, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS and Endangered Species Act regulatory requirements. Example practices/processes in Section 2.2.3 were revised to include sedimentation and water source contamination concerns.

12 – U.S. Department of the Interior (cont.)

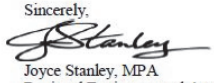
Engineered High Energy Crop Programs for the Southeastern United States – ER 15-0046

12-17

- Page 4-23. "The use of pesticides on the proposed EHECs has not been studied and would need to be in order to determine potential benefits or impacts on wildlife… there is the potential for major adverse impacts if increased amounts or applications were applied depending on the EHEC species and location." This could be the most problematic point in the EIS, given it states there will be a no effect on threatened or endangered species at the programmatic level but major adverse effects are possible if it is implemented. Therefore, the Department recommends DOE include a discussion about how it will implement a tiered approach to include additional consultations under the ESA on a site-specific basis here and throughout the document.

If you have questions or concerns, I can be reached at (404) 331-4524 or via email at joyce_stanley@ios.doi.gov.

Sincerely,



Joyce Stanley, MPA
Regional Environmental Assistant

cc:
Christine Willis – FWS
Gary Lecain - USGS
Anita Barnett – NPS
Robin Ferguson – OSMRE
Chester McGhee – BIA
OEPC – WASH

Page 4

DOE Response

12-12: Expanded title of Figure 3.2-1 to include "as Designated by the U.S. Forest Service."

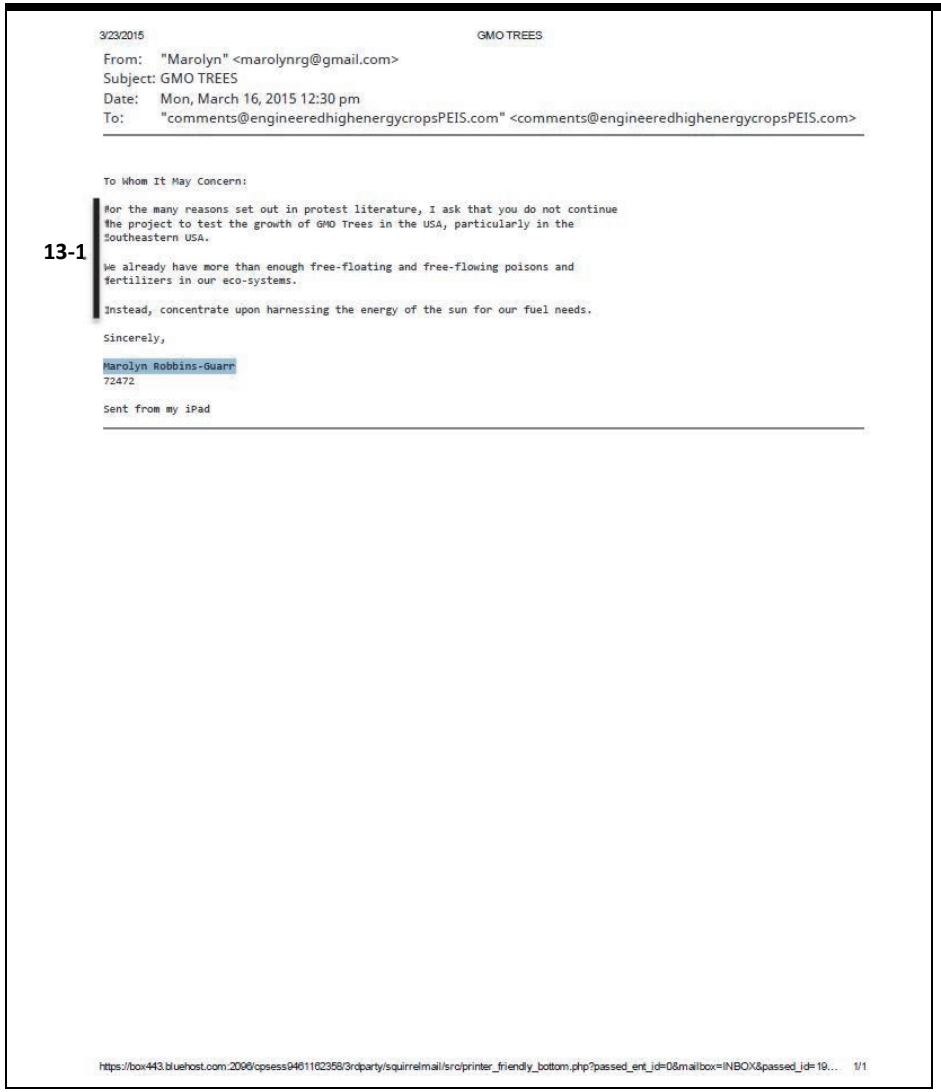
12-13: Table 4.5-1 revised to better match content in Section 4.5.

12-14: Section 4.5 has been revised to note that future site- and plant-specific environmental and Endangered Species Act reviews would be needed to identify concerns for a particular EHEC project. DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permits for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids falls under the regulatory authority of USDA APHIS, not DOE.

12-15: Section 4.5.2 has been revised to include statements on habitat for protected species as having the potential for foraging, transit, or temporary shelter.

12-16: Section 4.5.2 has been revised to include statements on habitat for protected species as having the potential for foraging, transit, or temporary shelter. In addition, Section 4.5.2 includes revisions noting the need for future (tiered) environmental reviews to determine presence of reptiles/amphibians that may be protected species and related to pesticide use.

12-17: Section 4.5 has been revised to note that future site- and plant-specific environmental and Endangered Species Act reviews would be needed to identify concerns for a proposed EHEC project, including adverse effects to protected species. These reviews may include desktop research to identify potential protected species and habitats and may warrant surveys on an individual parcel of land proposed as a field trial location. Section 5.3 has been revised to note adverse effects could occur if individual listed plants or wildlife species are harmed or result in a 'take' to a protected species; any loss or disturbance to threatened or endangered species could be substantial in the context of their limited population sizes. In addition, the PEIS has been revised to note that consultation with USFWS and applicable state agencies could be conducted to determine potential effects.

13 – Private Citizen	DOE Response
	**13-1:** Thank you for your comments.

3/23/2015 GMO TREES

From: "Marolyn" <marolynrg@gmail.com>
Subject: GMO TREES
Date: Mon, March 16, 2015 12:30 pm
To: "comments@engineeredhighenergycropsPEIS.com" <comments@engineeredhighenergycropsPEIS.com>

To Whom It May Concern:

13-1 For the many reasons set out in protest literature, I ask that you do not continue the project to test the growth of GMO Trees in the USA, particularly in the Southeastern USA.

We already have more than enough free-floating and free-flowing poisons and fertilizers in our eco-systems.

Instead, concentrate upon harnessing the energy of the sun for our fuel needs.

Sincerely,

Marolyn Robbins-Guarr
72472

Sent from my iPad

https://box443.bluehost.com:2096/cpsess9461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=19... 1/1

14 – Association of Fish & Wildlife Agencies	DOE Response

3/23/2015 Engineered High Energy Crop comments

From: "Bridget Collins" <bcollins@fishwildlife.org>
Subject: Engineered High Energy Crop comments
Date: Tue, March 17, 2015 7:22 pm
To: "comments@engineeredhighenergycropsPEIS.com" <comments@engineeredhighenergycropsPEIS.com>

Good evening Dr. Burbaum,

Please find the attached comments from the Association of Fish and Wildlife Agencies. Thank you for the opportunity to comment.

Best regards,

Bridget

****

Bridget Collins

Agriculture Policy Coordinator

Association of Fish and Wildlife Agencies

444 North Capitol Street NW, Suite 725

Washington, DC 20001

Phone: 202-624-5968

Work cell: 202-297-6759

bcollins@fishwildlife.org

Attachments:

untitled-[1.1].plain	
Size:	0.4 k
Type:	text/plain

2015-3-17_EngineeredHEC-PEIS_AFWA.DOCX	
Size:	197 k
Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.document

https://box443.bluehost.com:2096/cpsess9461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=21... 1/2

14 – Association of Fish & Wildlife Agencies (cont.)

DOE Response

ASSOCIATION of FISH & WILDLIFE AGENCIES

The voice of fish and wildlife agencies

Hall of the States
444 North Capitol Street, NW
Suite 725 • Washington, D.C. 20001
Phone: 202-624-7890
Fax: 202-624-7891
E-mail: info@fishwildlife.org
www.fishwildlife.org

March 17, 2015

Dr. Jonathan Burbaum, Program Director
Advanced Research Projects Agency-Energy (ARPA-E)
U.S. Department of Energy
ATTN: EHEC PEIS
1000 Independence Avenue, SW, Mailstop-950-8043
Washington, DC 20585

RE: Engineered High Energy Crops Programs, Draft Programmatic Environmental Impact Statement (PEIS) (DOE/EIS-0481)

Dear Dr. Burbaum:

The Association of Fish and Wildlife Agencies (the Association) is pleased to provide the following comments on the Draft Programmatic Environmental Impact Statement (PEIS) regarding Engineered High Energy Crop (EHEC) Programs. America's fish and wildlife are a public trust resource, and for more than 100 years state fish and wildlife agencies have upheld the primary responsibility for conserving those resources on public and private lands and waters within their borders. The Association represents the 50 state fish and wildlife agencies to advance sound, science-based management and conservation of fish, wildlife, and their habitats in the public interest.

Engineered High Energy Crops (EHECs) have the potential to contribute to a more sustainable energy future where renewable energy is produced by plant-based feedstocks, offsetting the use of fossil fuels. Currently, public and private entities are competing in an emerging industry to find profitable homegrown energy. The sustainability of potential feedstocks goes far beyond maintaining a viable business model though. Our native fish and wildlife resources depend on habitats that are increasingly being viewed as the best place to produce bioenergy feedstocks because their conversion would not displace food crops. True sustainability must also include considerations for native wildlife and habitats.

ENGINEERED HIGH ENERGY CROPS

14-2 This PEIS focuses on EHECs as feedstocks for bioenergy production. EHECs are developed for the characteristics that make them a great bioenergy crop – quick growing, hardy, tolerant, and low input requirements. Unfortunately, and as the PEIS acknowledges, these are the same characteristics that describe an invasive species. Moreover, they are the same characteristics that are likely to be enhanced through engineering, which could significantly increase the risk of invasion. While this is addressed in the PEIS, we believe that the risk is understated, including the potential contamination threat EHECs pose to native varieties which could pick up certain undesirable traits through cross pollination.

14-1: Thank you for your comments.

14-2: As described in Section 1.3, the conversion of corn starch and other crops into ethanol as a biofuel does not satisfy the challenge set by the Federal government. Energy crop research programs experimenting with a variety of plants that are non-cellulose sources, more efficiently grown, and easily extracted as a biofuel may be an advance in the environmentally responsible deployment of biofuels. There is a need for DOE or other Federal agency funding and support for EHEC Programs, without which scientific understanding and innovation in the responsible use of EHECs and deployment of EHECs would not develop at all or would develop more slowly. The purpose for agency action is for DOE to take action to catalyze the development and deployment of EHECs.

14 – Association of Fish & Wildlife Agencies (cont.)

14-2 cont. The list of potential bioenergy crops includes many non-native plants. We strongly encourage the Department of Energy (DOE) to put more emphasis on developing native feedstocks for energy use as native feedstocks are better adapted to the local environments, are more likely to provide habitat for native wildlife and pollinators, and are less likely to become invasive to other natural communities.

PROJECT ALTERNATIVES: IMPACT ANALYSIS

NO ACTION

14-3 The no action alternative assumes "that the development of EHECs would occur slowly or in an uncoordinated fashion," and without funding from DOE or other federal agency. We believe, however, that this is not the environmental baseline from which we are starting. Private companies – with or without federal funding – are actively developing and using EHECs, and these crops could have impacts on natural resources. To characterize the baseline as "slow or uncoordinated" is not accurate. In fact, it is more likely that impacts are already arising from current projects. We believe that lack of coordination contributes to unforeseen negative consequences for biological resources. We disagree that this alternative will have no impact to biological resources.

ALTERNATIVES 1, 2, AND 3

Land Use

14-4 Though the land use changes for many of the EHEC projects will likely be relatively small in scale, some critical habitats for wildlife are just a few thousand acres total. Even the conversion of "small" areas could have irreversible impacts to certain species, including migratory species dependent on available habitat occurring along the entirety of a migratory route. Additionally, the PEIS addresses much larger projects – up to 15,000 acres in size – which could be established by converting forest or Conservation Reserve Program enrollments. It is inaccurate to assume that EHEC projects will have minimal land use impacts.

Water Resources

14-5 The PEIS fails to acknowledge the potential water resource impacts from EHECs that may escape into waterways through seeds or rhizomes that could be distributed miles downstream. Additionally, irrigation requirements of EHECs or water use by escaped, invasive EHECs could have serious water quantity impacts, depleting local water resources.

Biological Resources

The PEIS is broad and generally written, and therefore it is extremely difficult to determine the effects EHECs could have on Biological Resources. Despite this, the PEIS characterizes many of the potential impacts as no impact or negligible, which is misleading and incorrect. For instance, the costs of new invasive species to regional ecosystems and economies could be extensive, yet the PEIS considers impacts from planting invasive species to be minor. That conclusion assumes sufficient funding and technology to control or eradicate invasive species, and that the methods of invasive species eradication will not be damaging to the native communities being invaded. Already, the cost of managing and controlling invasive species is estimated at $120 Billion, borne by state and federal agencies in particular. This doesn't include the cost of losses of native habitat, other agricultural production, or the cost of recovery of species whose populations become impacted by invasive species. Add to this the costs for managing and controlling new invasive species, and the impacts of such could not be negligible.

14-6 We think that this conclusion should be revisited, and at the very least, we'd appreciate additional explanation for this finding.

DOE Response

14-3: Current EHEC or EHEC-related projects are being prepared by different entities and not under one departmental program. As the purpose and need for the Proposed Action for this project is to develop and implement one or more programs to catalyze the development and deployment of EHECs, having a program to coordinate multiple research projects for bioenergy will result in a more organized approach and may reduce overall impacts from lessons learned.

14-4: DOE is only proposing to convert agricultural lands. The intent of the proposed EHEC Programs is not to convert 25% of the existing cropland in a county to EHECs. The percentages proposed represent the same restraints proposed in the Billion Ton Update report to "simulate the relative inelastic nature of agriculture in the near-term" (meaning growers do not swap out crops quickly). Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to review potential land use impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection.

14-5: Section 4.3 has been revised to address that irrigation requirements for proposed EHECs are unknown and that future site- and plant-specific environmental reviews would provide information on potential impacts to water resources, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permits for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids falls under the regulatory authority of USDA APHIS, not DOE.

14 – Association of Fish & Wildlife Agencies (cont.)

We agree with the statements made throughout the PEIS that site-specific reviews should be conducted to determine the potential effects on resources. We suggest that this statement appear in the summary table for each alternative. We also urge DOE to clarify the process for site-specific analyses – it is not clear whether this analysis refers to the APHIS (and possibly EPA) permitting or approval process, to additional project-specific NEPA analysis conducted by DOE, or to both. The Draft PEIS states that such site-specific analyses could check proposed EHECs against noxious plant lists, include a weed risk assessment, evaluate potential for cross-pollination, and evaluate potential impacts of an energy crop becoming invasive. DOE should identify the agency or agencies that will conduct required additional analysis, and should require that the site-specific findings be binding decisions for project approval and required BMPs. Since an energy crop does not need to be genetically engineered to become invasive or to have other environmental impacts, DOE should not limit site-specific analyses to only the permitting process for genetically engineered crops.

14-6 cont.

We strongly oppose the establishment of any known invasive species with federal funds, regardless of scale. The statement that "Negligible to no impacts are anticipated from the introduction or establishment of invasive species with the proper BMPs in place" is false. Properly implementing BMPs can reduce risk, but does not make risk negligible. Additionally, a lack of proper evaluation, placement and implementation of BMPs is more likely to lead to negative impacts to wildlife, including threatened or endangered species. BMPs should be viewed as precautions only and not assurances that invasive species will not escape or that they can be controlled after escape.

We appreciate the discussion of the BMPs to reduce risk of invasion, but the draft PEIS isn't clear about whether the BMPs would be voluntary or mandatory, or how BMPs are created for projects. BMPs should be mandatory and, at minimum, address the following:

- EHEC project site evaluations to avoid growing EHECs in sensitive habitats, priority watersheds, certain floodplains, or other geographic areas with sensitive natural resources,
- Prohibition of native habitat conversion to establish EHECs,
- Management practices to minimize EHEC escape risk, and to reduce erosion, water quality and quantity impacts, and wildlife population and habitat impacts,
- Procedures to minimize escapes during crop planting, management, harvest, transport, and storage,
- Monitoring protocols to quickly identify EHEC escapes, and
- Methods to control and eradicate escaped EHECs.

14-7

We recommend that the DOE create specific, regularly updated BMPs that address all issues listed above and that are tailored to each EHEC project and site through consultation with the state fish and wildlife agency and the U.S. Fish and Wildlife Service. We recommend that funding for all EHEC projects be contingent upon the use of site-specific and appropriate BMPs. All EHEC project sponsors should obtain a surety bond (or similar instrument) as a condition of funding. The bond must ensure sufficient funding for decommissioning of the EHEC planting field, containment, and eradication in the event of bankruptcy or field abandonment.

We feel it is appropriate to follow United States Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) standards during the development of field trials. However, we would also strongly recommend that state fish and wildlife agencies be involved in the process. State agencies may have applicable standards that provide more specific protection to local species and habitats.

DOE Response

14-6: DOE reviewed concerns related to the potential for invasiveness. Section 4.5 has been revised to identify that given the size of the field trials for Alternatives 2 and 3, the potential for invasiveness could be minor to moderate adverse impacts. DOE or another Federal agency proposing a Federal action related to an EHEC Program would be required to complete environmental reviews, such as NEPA reviews, for site- and plant-specific projects. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

14-7: Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

14 – Association of Fish & Wildlife Agencies (cont.)

We are troubled by a statement on page 5-8, *"Cumulatively, no long-term impacts on protected species, critical habitat, or migratory birds are anticipated since only existing cropland, pastureland, or forested lands could be used for EHEC field trials; these existing areas are not likely to contain protected species. Field activities would result in no changes to the habitat used by any listed species or species proposed for listing."* Species, whether or not currently protected under the Endangered Species Act, use a variety of habitats, including within pastureland and forested lands where field trials would take place; therefore it is incorrect and unsubstantiated to say that changes to these habitats would have no long term impacts. Evidence to support this finding would be appreciated. **14-7**

CONCLUDING COMMENTS

The development of renewable energy resources such as EHECs may be the future of energy production. This PEIS is an important step to ensure that such production is done safely and with proactive plans in place to prevent unintended consequences to native fish and wildlife, and the habitats required for their survival, as well as unintended costs to public and private landowners and managers. We believe many of the impact designations need reconsideration to adequately reflect and develop precautionary measures.

Thank you for the opportunity to comment and for considering the views of the Association of Fish and Wildlife Agencies and the state fish and wildlife agencies we represent. Please do not hesitate to contact the Association's Agriculture Policy Coordinator, Bridget Collins, at 202-624-3688 or at bcollins@fishwildlife.org if you have any questions or wish to discuss these recommendations.

Sincerely,

Ronald J. Regan

Ronald J. Regan
Executive Director

DOE Response

14-7: Section 5.3 has been revised to reflect that impacts to species and habitats would need to be reviewed in future project-specific environmental documentation on specific proposed EHECs. These reviews may include desktop research to identify potential protected species and habitats and may warrant surveys on an individual parcel of land proposed as a field trial location. Section 5.3 has also been revised to note adverse effects could occur if individual listed plants or wildlife species are harmed or result in a 'take' to a protected species; any loss or disturbance to threatened or endangered species could be substantial in the context of their limited population sizes. In addition, the PEIS has been revised to note that consultation with USFWS and applicable state agencies could be conducted to determine potential effects.

15 – Private Citizen	DOE Response
3/23/2015 Forests From: "carol bearss" <clbearss@hotmail.com> Subject: Forests Date: Tue, March 17, 2015 10:19 am To: "comments@engineeredhighenergycropsPEIS.com" <comments@engineeredhighenergycropsPEIS.com> **15-1** Save our trees. Sent from my iPhone https://box443.bluehost.com:2096/cpsess9461182358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=19... 1/1	**15-1:** Thank you for your comment.

16 – Center for Food Safety	DOE Response

3/23/2015 Center for Food Safety comments on DOE EHEC draft DPEIS

From: "Martha Crouch" <marticrouch@sbcglobal.net>
Subject: Center for Food Safety comments on DOE EHEC draft DPEIS
Date: Tue, March 17, 2015 5:44 pm
To: comments@engineeredhighenergycropsPEIS.com

To:

Jonathan Burbaum, Program Director
ARPA-E (Mailstop-950-8043)
ATTN: EHEC PEIS
U.S. Department of Energy
1000 Independence Avenue SW
Washington, DC 20585
comments@engineeredhighenergycropsPEIS.com
(202) 287-5453

Dear Jonathan Burbaum,

Please accept these Comments to Department of Energy on "Engineered High Energy Crop Programs Draft Programmatic Environmental Impact Statement (DOE/EIS-0481)" from the Center for Food Safety.

We appreciate the opportunity to participate in the process.

I will be sending pdf files of the documents cited in the comments in sequential emails for your docket.

Sincerely,

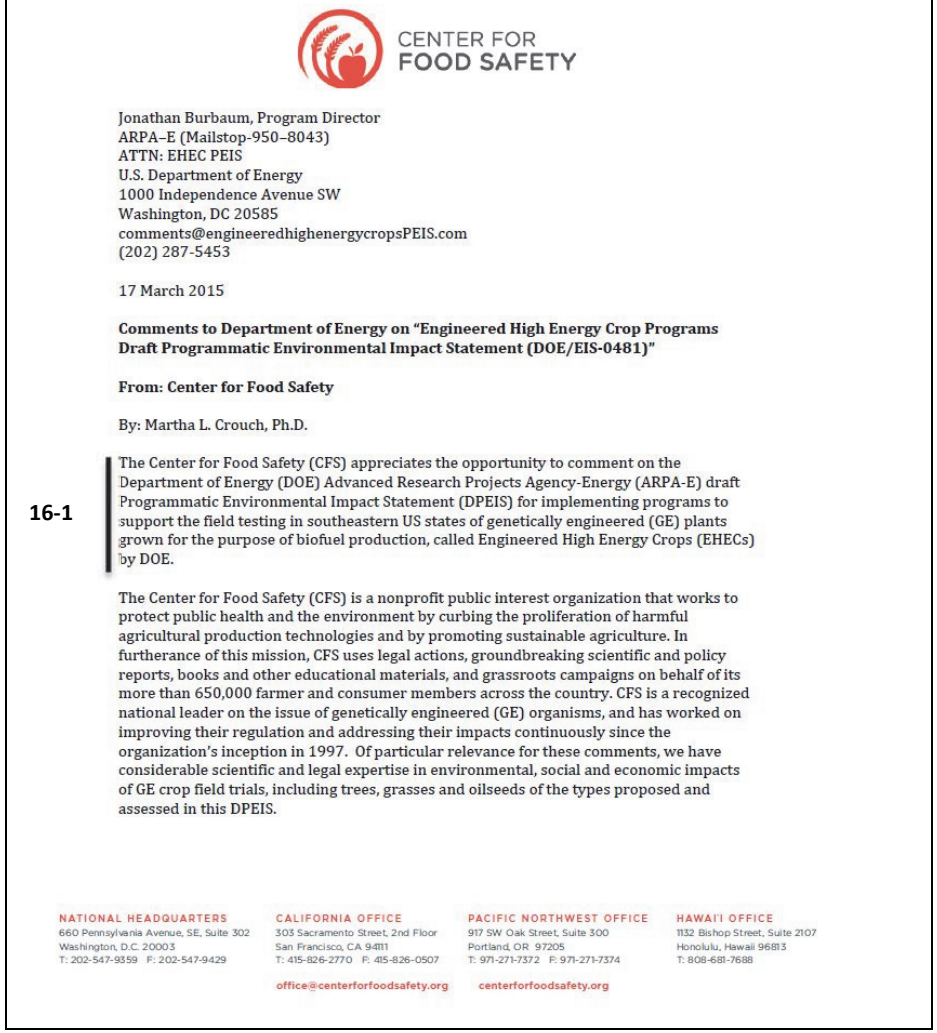
Martha L. Crouch, for Center for Food Safety

Attachments:

CFS Comments DOE draft PEIS EHECs 3-17-2015.pdf	
Size:	2 M
Type:	application/pdf

https://box443.bluehost.com:2096/cpsess9461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=20... 1/1

16 – Center for Food Safety (cont.)	DOE Response



CENTER FOR FOOD SAFETY

Jonathan Burbaum, Program Director
ARPA–E (Mailstop-950–8043)
ATTN: EHEC PEIS
U.S. Department of Energy
1000 Independence Avenue SW
Washington, DC 20585
comments@engineeredhighenergycropsPEIS.com
(202) 287-5453

17 March 2015

Comments to Department of Energy on "Engineered High Energy Crop Programs Draft Programmatic Environmental Impact Statement (DOE/EIS-0481)"

From: Center for Food Safety

By: Martha L. Crouch, Ph.D.

16-1

The Center for Food Safety (CFS) appreciates the opportunity to comment on the Department of Energy (DOE) Advanced Research Projects Agency-Energy (ARPA-E) draft Programmatic Environmental Impact Statement (DPEIS) for implementing programs to support the field testing in southeastern US states of genetically engineered (GE) plants grown for the purpose of biofuel production, called Engineered High Energy Crops (EHECs) by DOE.

The Center for Food Safety (CFS) is a nonprofit public interest organization that works to protect public health and the environment by curbing the proliferation of harmful agricultural production technologies and by promoting sustainable agriculture. In furtherance of this mission, CFS uses legal actions, groundbreaking scientific and policy reports, books and other educational materials, and grassroots campaigns on behalf of its more than 650,000 farmer and consumer members across the country. CFS is a recognized national leader on the issue of genetically engineered (GE) organisms, and has worked on improving their regulation and addressing their impacts continuously since the organization's inception in 1997. Of particular relevance for these comments, we have considerable scientific and legal expertise in environmental, social and economic impacts of GE crop field trials, including trees, grasses and oilseeds of the types proposed and assessed in this DPEIS.

NATIONAL HEADQUARTERS
660 Pennsylvania Avenue, SE, Suite 302
Washington, D.C. 20003
T: 202-547-9359 F: 202-547-9429

CALIFORNIA OFFICE
303 Sacramento Street, 2nd Floor
San Francisco, CA 94111
T: 415-826-2770 F: 415-826-0507

PACIFIC NORTHWEST OFFICE
917 SW Oak Street, Suite 300
Portland, OR 97205
T: 971-271-7372 F: 971-271-7374

HAWAI'I OFFICE
1132 Bishop Street, Suite 2107
Honolulu, Hawaii 96813
T: 808-681-7688

office@centerforfoodsafety.org centerforfoodsafety.org

16-1: Thank you for your comments.

16 – Center for Food Safety (cont.)

DOE Response

Overview

Biofuels have been heavily promoted and subsidized by various federal agencies in the US as a sustainable alternative to fossil fuels that will have lower impacts on global climate change, and that will reduce US reliance on foreign energy sources. So far, biofuels have been produced in the US mainly as ethanol from corn and biodiesel from soybeans. Biomass from wood chips is also increasingly being burned here and in importing countries for energy. Biofuels produced from cellulose are still in development with very limited commercial production. In spite of the various mandates and subsidies to push along biofuels, they have not lived up to their promise of sustainability, and one after another, citizen organizations have stepped away from biofuels as a solution to energy problems. Many are calling for an end to government support for biofuels based on new scientific, social and economic analyses that show harm at a number of levels (Searchinger and Heimlich 2015).

CFS has investigated the impacts of biofuels from various plant sources (CFS GE Tree Report 2013, CFS RFS Comments 2014) and agrees with the latest studies showing that they are generally not a good solution to energy problems (e.g. Searchinger and Heimlich 2015 and references therein). Biofuel crops compete with food crops for land decreasing food security, encourage conversion of natural areas to crops at the expense of the environment, and generally do not reduce greenhouse gas emissions. These negative impacts result from non-crop biofuel sources such as trees and grasses, as well as from food crop sources such as corn and soybeans.

Increasing the yield per acre of biofuel feedstocks is unlikely to reduce these negative impacts (Lindenmayer et al. 2012, Vandermeer and Perfecto 2007). In particular, the use crops for biomass energy production and for biofuels used domestically, and increasingly exported, is likely to create a market where demand for these crops will drive up prices such that more land of all types is converted to growing these crops (e.g. German et al. 2011).

For example, increasing productivity of corn combined with biofuels mandates is partly responsible for conversion of Conservation Reserve Program lands and fencerows to corn, with negative impacts on birds and other species (Brooke et al. 2009). Demand is leading to corn following corn more often, with pest and disease increases. At the global level, oil palms grown for biofuels are displacing native forests, with devastating effects on biodiversity, hydrology, and other social and environmental factors (Obidzinski et al. 2012). The global market has created a situation where the high productivity of oil palms makes it more likely that natural areas will be destroyed, rather than less likely. In the US, when fast-growing pine varieties were adopted in the Southeast, natural vegetation types were converted to these plantations on a massive scale, greatly impacting the environment (Conner et al. 2012).

16 – Center for Food Safety (cont.)

DOE Response

DOE is one of the federal agencies that promotes biofuel development, partly through research funded by the ARPA-E PETRO program that aims to increase energy yield per acre of biofuels via genetic engineering:

> The 10 projects that comprise ARPA-E's PETRO program, short for "Plants Engineered to Replace Oil," aim to develop non-food crops that directly produce transportation fuel. These crops can help supply the transportation sector with plant-derived fuels that are cost-competitive with petroleum and do not affect U.S. food supply. PETRO aims to redirect the processes for energy and carbon dioxide (CO2) capture in plants toward fuel production. This would create dedicated energy crops that serve as a domestic alternative to petroleum-based fuels and deliver more energy per acre with less processing prior to the pump. (http://arpa-e.energy.gov/?q=arpa-e-programs/petro)

The funded projects are mainly based on genetically engineering various plants to have novel characteristics designed to make them better biofuel candidates:

> The PETRO program seeks to genetically engineer a whole new class of crops that produce fuels which can be extracted directly from the plants themselves. Current biofuels production is limited by both the inefficient capture of solar energy by plants and the inefficient processes they use to convert CO2 from the atmosphere into fuels we can use. PETRO projects are experimenting with various plants--including pine trees, tobacco, sugarcane, and sorghum--to create molecules already found in petroleum-based fuels that can be dropped directly into the tanks of existing vehicles. PETRO biofuels would provide a stable, economically viable alternative to petroleum that limits the environmental impact of the transportation sector. (http://arpa-e.energy.gov/?q=arpa-e-programs/petro)

It is in this context that DOE proposes programs to facilitate field trials of plants engineered for biofuel production, the subject of this draft Programmatic Environmental Impact Statement, calling these plants Engineered High Energy Crops, or EHECs. Without this kind of federal support, DOE is concerned that the entire project of so-called advanced biofuels will fail:

> In the absence of DOE or other Federal agency funding and support for EHEC Programs, scientific understanding and innovation in the responsible growth of EHECs and, ultimately, commercial deployment of EHECs would develop more slowly or not at all. Accordingly, DOE needs to take action to catalyze the development and deployment of EHECs. (p. 10)[1]

[1] Page numbers for the DPEIS correspond to the pagination of the pdf file.

16 – Center for Food Safety (cont.)

Based on our extensive knowledge of impacts of GE crops and failed promises of biofuels, CFS does not support DOE's overall project to promote EHECs by facilitating field trials. As elaborated in these comments, the environmental, social and economic risks from such field trials have not been adequately assessed in DOE's DPEIS. The scope of the project is poorly defined and too large, the ability of DOE to ensure that EHECs are confined in the field trials is not demonstrated, harms from lack of containment are not well considered, alternatives are narrow in scope, and risks to endangered species and migratory birds are minimized.

CFS therefore supports the "no action" alternative, and encourages DOE to phase out its support of EHECs in favor of truly sustainable energy solutions.

Detailed comments

Scope of the project is poorly defined and unmanageably large, negative impacts are likely

DOE proposes to develop and implement programs that "catalyze the deployment of EHECs" and thus promote commercial biofuel success in the US, mainly through funding of aledgedly confined field trials throughout the southeastern US in order to evaluate their performance (p. 11). DOE defines EHECs broadly to include plants that are "engineered" through traditional breeding or via genetic engineering in order to "design" or "redesign" crops with increased per-acre fuel production:

> EHECs [engineered high energy crops] are agriculturally-viable photosynthetic species containing genetic material that have [sic] been intentionally introduced through biotechnology, interspecific hybridization, or other engineering processes (excluding processes that occur in nature without human intervention), and specifically engineered to increase energy production independent of increasing the amount of biomass by producing fuel molecules that can be introduced easily into existing energy infrastructure. (p. 5)

> Biofuel engineering seeks to breed or genetically modify plants to produce fuels or fuel-like precursors that can be blended into existing fuels or extracted directly from the plants as a ready-to-use resource. Biofuel engineering utilizes novel processes or alternative pathways to optimize the plants for energy capture and conversion, thus allowing more energy (fuels or fuel precursors) to be stored, absorbed, converted, and extracted. (p. 32)

16-2 CFS finds DOE's definition of EHECs that includes both traditional plant breeding (including inter-specific hybridization) and GE to be unusual and unacceptable. We have not seen traditional plant breeding defined as engineering in other contexts, including federal agencies or international regulatory bodies, nor do we consider plant breeding to be engineering of any type. Breeding does not involve engineers designing and producing

DOE Response

16-2: Proposed EHECs may include either GE or non-transgenic crops; the non-transgenic crops include plants with agronomic practices to increase energy yields from bioenergy crops per acre. The authority to regulate the release of novel interspecific hybrids falls under the regulatory authority of USDA APHIS, not DOE. Interspecific hybrids have been used for hundreds of years using crop breeding for a desired trait, usually hardiness or disease resistance. These hybrids are typically sterile; risk of outcrossing and invasiveness is low.

16 – Center for Food Safety (cont.)	DOE Response

anything to particular specifications. The breeder is basically just an educated matchmaker, choosing the varieties or species of plants to cross based on their preexisting characteristics. Then the breeder observes the offspring from the arranged crosses for desired characteristics arising from recombination of parental genes - no engineering blueprints or designs are involved with traditional breeding.

16-2 cont.

Also, specific federal regulations govern research, testing and commercialization of GE crops, requiring that DOE clearly differentiate GE vs. non-GE HECs in the DPEIS to analyze procedures and impacts. However, after lumping GE and non-GE HECs together in its definitions at the beginning, it is unclear in the rest of the DPEIS whether or how DOE will include non-GE HECs from in its field-trial testing programs.

In listing potential crops to be planted in the EHEC testing program, DOE categorizes EHEPs as being perennial herbaceous, annual herbaceous, or woody crops (Table S-1, p. 8) with no hint as to whether the particular "engineered" plants are GE or traditionally bred. DOE gives examples of crops being developed "under ARPA-E's PETRO Program, such as engineered varieties of camelina, loblolly pine, tobacco, giant cane, energy beet, sugarcane, miscanthus, sorghum, and switchgrass" (p. 47), as well as other candidates:

16 – Center for Food Safety (cont.)

DOE Response

There are three broad classes of energy crops—perennial herbaceous, annual herbaceous, and woody crops. Perennial herbaceous plants are plants that re-grow from their root-stock; these plants grow and bloom over the spring and summer, die in the autumn/winter, and return in the spring (from their root-stock). Annual herbaceous plants die at the end of their growing season and must be replanted each year. Woody crops are plants, such as trees or shrubs, that produces wood as its structural tissue; short-rotation woody crops are fast-growing species, such as Populus and Eucalyptus, that can be harvested year-round and continue growing year after year. Table S-1 identifies some examples of energy crops that have the potential to be EHECs (recognizing there are other possible species); this list does not represent the entire range of possible EHECs.

Table S-1: Examples of Plants with the Potential to Be EHECs

Perennial Herbaceous	Annual Herbaceous	Woody Crops
Agave	Camelina	Eucalyptus
Giant Cane	Energy Beet	Pine
Basin Wildrye	Maize	Poplar
Bull Rush	Sorghum	Spruce
Energy Cane	Tobacco	Willow
Guayule		
Jatropha		
Miscane		
Miscanthus		
Napiergrass		
Reed Canarygrass		
Sainfoin		
Salicornia		
Sugarcane		
Switchgrass		

From DOE's definitions of EHECs and Table S-1, then, it seems that DOE considers biofuel crops that are developed both with and without genetic engineering to be within the scope of this program, and thus presumably eligible for financial support to conduct confined field tests and evaluate their performance.

16-3 However, it is not clear whether or how DOE programs plan to carry out confined field tests for EHECs that are bred but not genetically engineered, because details of testing non-GE EHECs are not discussed further. The rest of the DPEIS focuses on details of testing GE EHECs. DOE needs to clarify whether it does indeed plan to include traditionally bred plants in this program: does this DPEIS assess impacts of genetically engineered high energy crops (GE HECs) alone, or high energy crops (HECs) more generally, including those that have been bred using traditional methods? If it includes HECs more generally, how will non-GE HECs be tested? Will they be grown under similar confinement protocols as GE HECs, and if so, what agencies will be responsible for oversight? For example, will field

16-3: For this PEIS, the specific EHEC – GE or non-GE – is unknown as the proposed EHEC Program and potential EHEC projects have not been developed. Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

16 – Center for Food Safety (cont.)

16-3 cont. trials of non-GE HECs be regulated by APHIS as noxious weeds in some way, and if so, what are the parameters?

16-4 For GE HECs, DOE is going to rely on the USDA to oversee and regulate confined field-tests via permits and notifications in order to keep the experimental plants from spreading into the environment via pollen, seeds, or vegetative propagules, to mitigate potentially significant negative impacts. For example, to mitigate invasiveness:

> Given the size of the pilot-scale (up to 250 acres) and the deployment-scale (up to 15,000 acres), the potential for invasiveness is a concern to be mitigated. Field trials would need to, at a minimum, follow USDA APHIS permit requirements. (p. 18)

However, DOE does not evaluate how effectively USDA's procedures will prevent "escape" of GE HECs from the kinds of field tests DOE programs will support, and therefore DOE is unable to realistically determine impacts of such field trials. DOE must assess strengths and weaknesses of USDA's field test program as it applies to DOE's plans for GE HECs. And what specifically does DOE mean by "at a minimum" trials will follow USDA permit requirements? Does DOE plan to impose more stringent requirements, and if so, what might be inadequate about USDA's permit requirements?

Environmental risks of inadequate containment of GE EHECs are serious. Genetically engineered plants that escape from cultivation can fundamentally alter ecosystems by competing with wild species, and the novel genes and proteins in these GE plants can have potentially harmful impacts on other organisms. Also, some GE plants can hybridize with their wild relatives, altering the genetic and biochemical composition of plant populations in ways that affect how they function in the environment, or can disrupt trade (CFS Contaminating Wild Report 2006, CFS GE Trees 2013).

16-5 Escape of transgenes from GE crops to wild plants and ecosystems has occurred before. Some are mentioned very briefly on p. 50, but not analyzed for what they mean for EHECs. Several of these escapes occurred from USDA-regulated field trials. For example, Monsanto's experimental Roundup Ready bentgrass field tested in 2002 continues to spread and cross with wild grasses miles from original test sites in central and eastern Oregon (Reichman et al. 2006, Snow 2012, Zapiola and Mallory-Smith 2012). In the mid-2000s, the transgene in Roundup Ready alfalfa moved from regulated test plots into feral alfalfa populations in several western states (Bagavathiannan and VanAcker 2009, Jenkins 2007).

Additionally, GE crops have repeatedly contaminated conventional field crops. Star-Link corn, which was not approved for human consumption due to its potential to cause allergies, was found in taco shells in 2001 (EPA Starlink 2008). Bayer's unapproved Liberty Link rice was found growing in five southern US states and was detected in rice exports, with contamination likely coming from field trials (PNAP 2009). Most recently, Monsanto's GE wheat was found growing in Oregon even though field trials of the wheat had been

DOE Response

16-4: In Section 1.1.4, the PEIS has been revised to note that per the coordinated framework approach, permit requirements must be followed. Proposed EHECs may include either GE or non-transgenic crops; the non-transgenic crops include plants with agronomic practices to increase energy yields from bioenergy crops per acre. The authority to regulate the release of novel interspecific hybrids falls under the regulatory authority of USDA APHIS, not DOE. Interspecific hybrids have been used for hundreds of years using crop breeding for a desired trait, usually hardiness or disease resistance. These hybrids are typically sterile; risk of outcrossing and invasiveness is low.

16-5: DOE recognizes the concerns raised related to inadequate confinement of EHECs. Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

16 – Center for Food Safety (cont.)

suspended for several years, and the wheat was never approved for commercial use (Gillam and Ingwersen 2013). Each case resulted in severe economic harm to farmers and producers. These examples highlight the need to seriously address the potential escape of transgenes from EHECs from field tests.

In general, USDA field trial standards for confinement are inadequate to consistently prevent escape and gene flow (CFS Contaminating Wild 2006). The isolation distances recommended by USDA are based on seed purity standards for conventional breeding which were intended to reduce, not entirely prevent, gene flow. Experiments testing these requirements have often shown them to be inadequate. And, even when gene flow frequencies or seed escapes are low, if the engineered gene provides a fitness advantage, the frequency of the trait in unintended environments can greatly increase over time (CFS Contaminating Wild 2006). It is also important to understand that because there has been no active monitoring program of possible gene flow or escapes from field trails, the examples of escapes listed above could underestimate the actual frequency.

16-6

Loblolly pine is a likely EHEC that will be planted in DOE's EHEC program, and is a good example of the difficulty of keeping gene flow from occurring, and potential harm to ecosystems of escapes. GE loblolly pine trees have pollen (Williams 2010) and seeds (Williams et al. 2006) that travel for miles and it is virtually certain that GE trees will escape as seeds from field tests or plantations into natural forests, or will pollinate wild trees, and thus spread the novel engineered genes into forests or non-GE plantations where they could have negative impacts (Farnum et al. 2007). Many birds and other animals make their homes in forests dominated by loblolly pine, including endangered species (Wood et al. 2014), and changes in characteristics of pines could have negative impacts that need to be assessed. According to the US Forest Service, for example, "[l]oblolly pine seeds are an important food source for birds and small mammals. More than 20 songbirds feed on loblolly pine seeds, and the seeds make up more than half the diet of the red crossbill. Deer and rabbit browse seedlings. Loblolly pine stands provide cover and habitat for white-tailed deer, northern bobwhite, wild turkey, and grey and fox squirrels. Old-growth loblolly pine provides nesting habitat for the endangered red-cockaded woodpecker." (http://www.fs.fed.us/database/feis/plants/tree/pintae/all.html)

16-7

Now, USDA has decided not to regulate some GE crops at all, and many of the unregulated GE crops are specifically designed for biofuel production (Gurian-Sherman 2015). DOE needs to determine whether and how it will handle testing of these crops that USDA will not regulate, but are nonetheless GE with the same risks as those GE HECs USDA will regulate. Examples include ArborGen's GE loblolly pine with increased wood density (CFS Pine PR 2015), Ceres' GE sorghum with greater biomass and more fermentable sugars, and several Ceres' GE switchgrass lines designed for energy production (http://www.aphis.usda.gov/wps/portal/?1dmy&urile=wcm%3Apath%3A/aphis_content_library/sa_our_focus/sa_biotechnology/sa_regulations/ct_reg_loi).

DOE Response

16-6: There are GE strategies that have been developed to prevent gene flow from plantations to natural forests, which could mitigate escape. Regardless, each transgenic event would be assessed on a site- and plant-specific basis through applicable regulatory mechanisms for potential negative impacts. Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

16-7: Proposed EHECs may include either GE or non-transgenic crops; the non-transgenic crops include plants with agronomic practices to increase energy yields from bioenergy crops per acre. The authority to regulate the release of novel interspecific hybrids falls under the regulatory authority of USDA APHIS, not DOE. Interspecific hybrids have been used for hundreds of years using crop breeding for a desired trait, usually hardiness or disease resistance. These hybrids are typically sterile; risk of outcrossing and invasiveness is low.

16 – Center for Food Safety (cont.)

Although these GE biofuels crops are on the "not regulated as a plant pest risk" list, some (sorghum, for example) may be regulated by USDA using its noxious weed authority, but details have not been forthcoming (BRS Sorghum Letter 2014).

16-8 In fact, USDA has decided to open a process of reworking how it regulates all GE crops, including field-trials (USDA Rule Withdrawal 2015), and CFS urges DOE to hold off on writing a final PDEIS until the USDA process is finished, because DOE relies so heavily on USDA regulation for confining the field trials that are key to this program and needs to know the direction of USDA in order to make good risk assessments.

In any case, the capacity of USDA to regulate the field trials proposed by DOE is likely to be overwhelmed by the spatial scope of the program, as described below.

16-9 DOE uses another maverick definition in the DPEIS: eligible "cropland" that can be planted in EHECs. This category includes existing cropland that is managed for food and fiber crops, but also "pastureland" and "forested areas." Although these land uses are not in the Glossary (p. 279), from context it seems that pasture includes any land used to at least occasionally graze livestock, from highly managed monoculture grasses or legumes to unmanaged mixed vegetation; and forested areas range from intensively managed single-species plantations to lightly managed, naturally regenerating, biodiverse woodlands.

Obviously the environmental consequences of converting permanent, vegetatively diverse pasture or natural forests to purpose-grown energy crops are likely to be greater than converting more managed areas, yet in the DPEIS DOE often claims that impacts will be mild, seeming to forget that not all of the eligible land is highly or even moderately managed to begin with (see, for example, discussion of endangered species, below).

For example, when DOE looks at impacts to wildlife from field tests of EHECs (alternative 1, each field 5 acres or less, up to 25% of county area), it concludes the following:

> Although the exact impacts cannot be predicted without further research, minor adverse impacts are anticipated since only existing croplands, pasturelands, and forested lands would be used under Alternative 1 [or the other alternative]. Any local impacts to wildlife populations at EHEC field trial sites would be dependent on the wildlife species, crop species and its genetic modification, and the location of the field trial. Native wildlife habitat loss should not occur under Alternative 1 because lands currently in agricultural production would be used for the proposed EHEC field trials. (p. 190)

16-10 This conclusion ignores the fact that native wildlife habitat can be found within land in current agricultural production (cranes feeding in corn fields, bats eating insects over alfalfa fields, monarch butterflies breeding on milkweeds in soybean fields, and so on), but more importantly, lightly managed pastureland and especially forested lands that include natural forests are likely to be the main habitats for much of the native wildlife throughout

DOE Response

16-8: Recipients seeking funding or permits from DOE or another Federal agency for proposed projects relating to EHECs would be required to apply for USDA APHIS permits and notifications in compliance with applicable law and regulations. In addition, DOE or another Federal agency proposing a Federal action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts.

16-9: The glossary has been revised to include definitions for existing cropland, pastureland, and forested land to clarify the intent / purpose within the PEIS.

16-10: Section 4.5 has been revised to expand on the need for future site- and plant-specific environmental reviews, including NEPA reviews, to determine the presence of plants, wildlife, listed species, or critical habitats. Section 4.5.2 has been revised to include statements on habitat for protected species as having the potential for foraging, transit, or temporary shelter. In addition, surveys of the project area may be warranted to identify the potential of listed species or habitats on an individual parcel of land proposed as a field trial location.

Native wildlife may be found within existing cropland, pastureland, or forested areas; however, as these are managed areas, it is expected that species are displaced on a recurring basis during typical management. Similar impacts would be expected from EHECs.

16 – Center for Food Safety (cont.)

16-10 cont. the southeast. The act of converting these lands to EHEC field trials is likely to severely disrupt habitat for native wildlife. Emphatically, risks must be assessed taking into account the full range of eligible land use types.

The geographic scope is large, encompassing a sizable part of nine states:

> The geographic scope for this PEIS is limited to existing croplands, pasturelands, and forested areas in the states of Alabama, Florida (excluding the Everglades/Southern Florida coastal plain ecoregion), Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. (p. 7)

16-11 Impacts of the amount of land that could be converted to EHECs in these nine states are underestimated in the DPEIS. DOE drastically underestimates the amount of land area that could be converted to EHEC field tests under its program, and thus all other impacts, by calculating potential acres in EHECs based on 10% of eligible land (Table 4.2-2, p. 173) rather than the allowed 25%, and then claiming that this is a "relatively small amount of vegetation being converted":

> This Draft PEIS analysis reviews the potential land use impact for the proposed EHEC Programs regardless of the crop type (perennial herbaceous, annual herbaceous or woody crop). As described in Chapter 2, only existing cropland, pastureland, or forested land could be used for the confined field trials. New non-agricultural lands would not be allowed to enroll in an EHEC Program. As detailed in Section 2.3.1, the number of acres enrolled in the EHEC project areas for crop production shall be limited to no more than 25% of the cropland in a given county. Specific acreage in a given county could be reviewed in future species- and site-specific environmental compliance review.
> ...
> As described in Chapter 2, only 10% of the existing cropland (including pastureland and forested areas) could be converted to EHEC confined field trials each year in each county. The total amount of cropland that can be converted into EHECs (perennial herbaceous, annual herbaceous, and woody crop) in any given county is limited to 25%. This equates to a relatively small amount of vegetation being converted from traditional crops, pastureland, or forested lands to EHECs. (p. 172)

Examples of the total amount of land that could be converted to EHECs per year in each state are given in Table 4.2-2 using Alternative 1 as an example, although all action alternatives have the same limits. Note that for Alternative 1, well over a million individual field test plots would be allowed in the southeast if 10% of the eligible land were converted to EHECs (total Alternative 1 acres divided by 5 acre plots).

DOE Response

16-11: The intent of the proposed EHEC Programs is not to convert 25% of the existing cropland in a county to EHECs. The percentages proposed represent the same restraints proposed in the Billion Ton Update report to "simulate the relative inelastic nature of agriculture in the near-term" (meaning growers do not swap out crops quickly). EHECs are not intended to outgrow existing agricultural production of soybeans and cotton. Proposed EHEC Programs would require future site- and plant-specific environmental documentation to review not only the land acreage changes but also to determine the proximity to refineries. Locations of the proposed EHEC field trials would likely rely on infrastructure – refineries, road or rail networks, etc. – to assist with production.

16 – Center for Food Safety (cont.)

DOE Response

Table 4.2–2 indicates the land use by state in the project area for the No Action Alternative. Table 4.2–3 summarizes the changes caused by implementing Alternative 1 (assuming that 10% of the existing cropland was converted to EHEC confined field trial cropland in any county) from the No Action Alternative. Land use changes range between 459,555 acres (91,911 five-acre plots - South Carolina) to

1,329,766 (265,953 five-acre plots - Kentucky) of cropland, pastureland, or forested land converted to EHECs from that of the No Action Alternative.

Table 4.2-2: Farmland Use (in acres) in the Project Area for Potential EHECs under the No Action Alternative

State	2007							
	Total Farmland (acres)	Cropland (acres)	Woody Crops (acres)	Pastureland (acres)	House lots (acres)	Farmland in Conservation (acres)	No Action	Alternative 1 (acres)
Alabama	9,033,537	3,142,958	3,375,438	2,017,079	498,062	494,441	0	853,547
Florida	9,231,570	2,953,340	2,330,336	3,221,202	726,692	224,867	0	850,488
Georgia	10,150,539	4,478,168	3,712,672	1,341,985	617,714	331,166	0	953,282
Kentucky	13,993,121	7,278,098	3,107,137	2,912,424	695,462	376,049	0	1,329,766
Mississippi	11,456,241	5,530,825	3,610,991	1,639,243	675,182	1,107,406	0	1,078,106
North Carolina	8,474,671	4,695,204	2,201,609	941,609	436,249	163,676	0	803,842
South Carolina	4,889,339	2,151,219	1,827,191	617,136	293,793	264,950	0	459,555
Tennessee	10,909,789	6,047,348	2,042,868	2,545,047	334,535	289,200	0	1,083,527
Virginia	8,103,925	3,274,137	2,319,491	2,150,933	359,364	70,112	0	774,456

Source: (U.S. Department of Agriculture -- Economic Research Service, 2014)

Actually, the amount of land that could be converted to EHECs is large and significant relative to current vegetation types. Using Alabama as an example (NASS Alabama 2014), if 10% of eligible land were to be planted in EHECs, the number of acres would surpass the combined acres in soybeans and cotton (853,547 acres in EHECs vs. ~823,000 acres in soybeans and cotton). If the allowed 25% of cropland acres were in EHECs (2,133,868

16 – Center for Food Safety (cont.)

acres), that would almost equal Alabama's acreage in the 6 crops with most acres planted in the state: hay, soybeans, cotton, corn, peanuts and wheat combined (~2,303,000 acres).

16-12

Another way to think about the impacts of using 25% of the eligible land in each county to grow confined trials of EHECs is to look at a specific example of a particular county. Randomly choosing a rural county in Tennessee – Madison County – there are 557 square miles or 356,480 acres of total land (http://www.city-data.com/county/Madison_County-TN.html). From statistics of harvested crops, about 25% of the total land is devoted to row crops and orchards. Pastures and forestland are not included in these statistics, but conservatively, if another 25% of the total land in the county is in those uses, then half of the acres in the county is in the category that is eligible for conversion to EHEC field trials, or about 178,000 acres. If the 25% allowed in DOE's program were converted, that would be 44,560 acres, approximately equal to the acreage in cotton and wheat in that county. It is realistic to assume that many rural counties will have similar proportions of land use.

In other words, DOE is proposing to allow confined field trials of EHECs to be planted on the amount of land currently used for some of the major crops combined in these southeastern states. This is possible because DOE is including pastureland and forests in their definition of "cropland", and for many of these states, pastures and forests combined comprise the same or double the acres counted in traditional cropland (Table 4.2-2, p 173).

Needless to say, this amount of land in confined field trials would be unwieldy for USDA to regulate under their notification and permit system. DOE does not assess the capacity of USDA to oversee these trials that are equivalent to the current acreage in major commercial crops in these areas.

This amount of land in EHECs would also dwarf the amount of land currently in regulated field trials in any of these states. For example, APHIS-regulated field trials active in 2014 in Alabama totaled roughly 20,000 acres[2], compared to the 2 million-plus acres of regulated tests DOE will allow in this program for Alabama alone.

Yet another way of grasping the enormity of the proposed confined testing program is to estimate the amount of land that DOE expects will be planted in EHECs in the southeast, assuming they are commercialized someday. What percent of existing cropland as defined by DOE will need to be planted in EHECs then? As much as in the major food and fiber crops such as cotton, soybeans, and corn today, and thus similar to the testing program? If so, DOE is actually proposing a testing program at the commercial scale, which is clearly beyond what is needed to determine feasibility and introduces unacceptable risks. The

[2] Estimates of total area of USDA regulated field trials can be calculated by searching the Virginia Institute of Technology's Information Systems for Biotechnology database for "Permits and Notifications" limited by location: http://www.isb.vt.edu/search-release-data.aspx. Not all entries include acreage, but most do. For this estimate, trials with no acreage information were assigned 1,000 acres, likely an overestimate.

DOE Response

16-12: Future site- and plant-specific environmental compliance reviews would be prepared to review each EHEC at the proposed locations for field trials. During these site- and plant-specific reviews, detailed analyses would be conducted to review the concerns on a county – individually and cumulatively. The intent of the proposed EHEC Programs is not to replace agricultural crops. The comments identified here exaggerate the maximum extent of the percentages without considering a variety of factors such as availability of these larger acreages for EHECs, infrastructure, and interest from a potential grower. The socioeconomic impacts of converting one existing land type to another for a proposed EHEC field trial may be exorbitant or the conversion may not have the acceptable soil conditions. All of these aspects would be considered and determined in the future site- and plant-specific documentation where surveys and research for the specific sites and EHECs can be considered. DOE is by no means proposing to grow EHEC field trials on land that will outpace the ability for the growth of major crops for the action area.

16 – Center for Food Safety (cont.)

National Research Council (2004) noted that it is practically unfeasible to prevent contamination or gene flow from commercial-scale production of GE plants.

16-13 The fact that DOE proposes such unrealistic total acreage limits for its EHEC field trials that are way outside of precedent for regulated trials does not inspire confidence in the ability of DOE to manage the program with appropriate risk assessment and mitigation.

Note that all of the alternatives except for the "No Action" alternative have identical allowable land use totals.

DOE's proposed Alternatives are narrow in scope.

The action alternatives proposed by DOE differ only in the maximum size of individual fields that are allowed to be planted in EHECs:

16-14
- Alternative 1 (deployment scale) allows field tests to be up to 5 acres in size. This is a typical field trial size for other GE plants, in our experience of studying field trial data. Although a large number of such trials are allowed up to 25% of eligible acres in a county, the particular configuration other than "non-contiguous" of multiple trials is not described – how close to each other, what kind of barriers if any between trials, and so on.

16-15
- Alternative 2 (pilot scale) allows field tests to be up to 250 acres in size, a relatively large field size for individual tests of GE crops, but not uncommon as crops are close to being commercialized. Why 250 acres was chosen, and not a smaller or larger size, is not elaborated, nor are various configurations of non-contiguous multiple trials discussed.

16-16
- Alternative 3 (development scale) allows field tests of up to 15,000 acres in size, presumably in one parcel if desired. A field size of 15,000 acres as proposed in Alternative 3 is larger than all but the very largest individual commercial fields of any crop, as far as we know. If such a field were square, it would be 23.5 miles on a side. The idea that a field of this size could be managed as a confined field trial – scouted for volunteers, pollen or seeds contained and monitored, incursions of animals or people noted, and other APHIS requirements met – is ludicrous. And for a particular county, one or two field trials of this size would take up the entire land area allowed. This size field is "estimated to be the acreage of EHECs needed to produce biomass for a hypothetical, small-scale, commercial ethanol plant," although presumably the same biomass could be produced in a number of much smaller fields in any of the action alternatives presented (p. 12)

A broader range of alternatives that differ by other parameters need to be presented and assessed in the DPEIS, such as alternatives that exclude forestland, or forestland and pastureland from the eligible cropland definition, or alternatives that differ in the total

DOE Response

16-13: DOE estimated that to supply a 10 million gallon/year corn ethanol plant (the smallest commercial plant) would take approximately 30,000 acres of corn. One goal of the ARPA-E PETRO Program is for the development of biofuels that are 2 times corn; therefore, the deployment-scale alternative was calculated to be half that amount of acreage, or 15,000 acres. DOE does not intend for the proposed EHECs to outcompete other field trials or agricultural crops in these States.

16-14: As mentioned earlier, for this PEIS, the specific EHEC – GE or non-GE – is unknown as the proposed EHEC Program and potential EHEC projects have not been developed. Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on potential impacts, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements.

16-15: Section 2.3.2 has been revised to include the reasoning behind 250 acres as a pilot-scale field trial size.

16-16: For the proposed Alternatives, DOE chose these levels for the purpose of analysis to advance these particular technologies that would advance slower without Federal support. DOE may choose an acreage in between these proposed ranges. As identified in Section 2.3.3, DOE estimated that to supply a 10 million gallon/year corn ethanol plant (the smallest commercial plant) would take approximately 30,000 acres of corn. One goal of the ARPA-E PETRO Program is for the development of biofuels that are 2 times corn; therefore, the deployment-scale alternative was calculated to be half that amount of acreage, or 15,000 acres. DOE does not intend for the proposed EHECs to outcompete other field trials or agricultural crops in these States and it would be likely that a number of smaller field trials would be located together.

16 – Center for Food Safety (cont.)

amount of land allowed in EHECs per county. Other alternatives could limit field-testing to native species, or to varieties engineered to be sterile.

Endangered Species Act (ESA) concerns are not adequately addressed

16-17

DOE provides an inadequate assessment of risks to species protected under the ESA in the DPEIS, making unwarranted assumptions about whether or not such species will be present in field trial sites, or would be disrupted by land use changes that accompany converting eligible land to these trials:

> Threatened and Endangered Species and Critical Habitat. Potential impacts on threatened and endangered species and critical habitat—assuming they are present in the project area—could range from low to high depending on the extent of the disturbance or impact. For this Draft PEIS, at the programmatic level, no effect to threatened and endangered species or critical habitat are anticipated since only existing croplands, pasturelands, or forested lands could be used for EHEC field trials; these existing agricultural and forested lands are not likely to contain protected species. If protected species were to enter the site, their presence would be fleeting as the habitat is either not suitable or does not contain constituent elements required by the species. (p. 191)

As discussed above, "existing croplands, pasturelands, or forested lands" encompass a wide range of management practices and a significant amount of the total land in the southeastern states. Impacts to all types of wildlife are possible, including protected species.

Also, traditionally defined cropland itself does provide habitat for some listed species at various stages in their lifecycles, including listed birds, mammals and insects. Examples include, but are not limited to, Louisiana black bears, Indiana bats, and American burying beetles.

In fact, CFS in collaboration with the Center for Biological Diversity, and joined by the Xerces Society for Invertebrate Conservation and a prominent monarch biologist Lincoln Brower, recently petitioned FWS to protect monarch butterflies as a threatened species under the ESA (CFS Monarch ESA Petition 2014). FWS is undertaking a status review now. For monarchs, the most important summer breeding habitat has been corn and soybean fields in the Midwestern state where, until recently, their larval host plant – common milkweed – coexisted at low but biologically significant levels along side or within crop fields, typically at levels that did not cause economic harm. A change in farming practices related to adoption of genetically engineered crops starting in the late 1990s caused almost complete eradication of milkweed from over a hundred million acres of corn and soybean fields, contributing to a 90% decline of monarchs in less than 20 years.

DOE Response

16-17: As mentioned previously, Section 4.5 has been revised to expand on the need for future site- and plant-specific environmental reviews, including NEPA reviews, to determine the presence of plants, wildlife, listed species, or critical habitats. In addition, surveys of the project area may be warranted to identify the potential of listed species or habitats on an individual parcel of land proposed as a field trial location. If the proposed EHEC could affect a protected species, consultation with USFWS could be conducted to determine overall impacts and potential mitigation measures.

16 – Center for Food Safety (cont.)

The changed farming practice that caused such a large loss of habitat is use of the herbicide glyphosate on genetically engineered glyphosate-resistant corn and soybeans. Glyphosate applied as milkweed plants are growing is particularly lethal to them, as CFS documents in a recent report (CFS Monarch Report 2015, CFS Monarch Report Summary 2015). This example illustrates the importance of assessing impacts of GE crops to wildlife in all kinds of land use areas, including cropland.

16-18 DOE did attempt to identify the listed species that occur in the southeastern states, but did not include listed aquatic organisms such as fish:

16-19

> Table D-1 lists protected species identified for the states in the project area and attempts to identify possible species distribution based on the state and corresponding Level II ecoregions. Note that listed aquatic species, such as clams, corals, fishes, and sea turtles, are not included because these species would not be found in-land at agricultural areas within the project area. (p. 312)

DOE does discuss connections between aquatic ecosystems and land-based ecosystems, and how agricultural practices impact aquatic species due to siltation, fertilizer and pesticide runoff, and other perturbations (e.g. Section 3.3, p. 73). However, that tight link between cropland and aquatic systems seems to be forgotten here, and only serves to emphasize that DOE is not an expert agency regarding endangered species. Research in the Midwest demonstrated that corn crop debris could in fact become an important source of plant material in headwater streams (Rosi-Marshall et al. 2007), and this presumably applies to other crops as well, with impacts that must be assessed.

16-18 cont. Therefore, DOE must consult the appropriate expert agencies regarding impacts on listed species of this action. That would be the US Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS), depending on the species (p. 286).

Migratory Bird Act concerns are not adequately addressed

DOE is also not an expert agency regarding migratory birds, nor is APHIS on whom they rely to determine there would be no impact of this action:

> APHIS has determined that it is reasonable to assume that the activities at field test sites, such as planting, collecting samples, and eventual harvesting, would not impact migratory bird populations since they are not expected to nest or permanently inhabit the confined field test sites. (U.S. Department of Agriculture-Animal and Plant Health Inspection Service, 2010). (p. 191)

16-20 Again, DOE must consider the impacts from land use changes from testing EHECs involving the full range of eligible acres, including natural forests and pasturelands, not just already intensively managed, traditionally defined cropland. The large land area allowed in DOE's

DOE Response

16-18: Future site- and plant-specific environmental documentation would review potential impacts to aquatic species. Section 4.5.2 and Appendix E have been updated to include aquatic species. It is anticipated that the project-specific environmental reviews would provide information on pesticide use for the proposed EHEC and potential concerns to waterways, should they be located adjacent to or near the proposed site locations. Consultations with the appropriate agencies would be conducted on a project-specific basis as warranted.

16-19: Section 4.5.2 and Appendix E have been updated to include aquatic species.

16-20: Migratory bird concerns would be assessed in future project-specific (site- and EHEC plant -specific documentation). Section 3.5 includes a review of migratory birds and flyways in the project area. Section 4.5 has been revised to include concerns related to migratory birds. Section 4.5.2 has been revised to include statements on habitat for protected species as having the potential for foraging, transit, or temporary shelter.

16 – Center for Food Safety (cont.)

DOE Response

16-20 cont. plan also must be taken into account. And traditionally defined cropland is in fact known to provide significant habitat to migratory birds at various stages in their life cycles.

Summary

CFS has shown that the environmental, social and economic risks from DOE's program to facilitate EHEC field trials have not been adequately assessed in DOE's DPEIS. The scope of the project is poorly defined and too large, the ability of DOE to ensure that EHECs are confined in the field trials is not demonstrated, harms from lack of containment are not well considered, alternatives are narrow in scope, and risks to endangered species and migratory birds are minimized.

CFS therefore supports the "no action" alternative, and encourages DOE to phase out its support of EHECs in favor of truly sustainable energy solutions.

References

Bagavathiannan MV, Van Acker RC (2009) The Biology and Ecology of Feral Alfalfa (*Medicago sativa* L.) and Its Implications for Novel Trait Confinement in North America. Critical Reviews in Plant Sciences 28 (1): 69- 87.

BRS Sorghum Letter (2014) Ceres' GE sorghum is not a regulated article. http://www.aphis.usda.gov/biotechnology/downloads/reg_loi/brs_resp_ceres_reg_loi_ge_sorghum.pdf

Brooke R, Fogel G, Glaser A, Griffin E, Johnson K (2009) Corn ethanol and wildlife: how increases in corn plantings are affecting habitat and wildlife in the Prairie Pothole Region. A University of Michigan study published by the National Wildlife Federation, http://www.nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2010/Corn-Ethanol-And-Wildlife.aspx, full report at http://www.nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2010/~/media/PDFs/Wildlife/01-13-10-Corn-Ethanol Wildlife.ashx.

Conner, W, Fabrizio, L, Sapp, B (2012) Status of Private Cypress Wetland Forests in Georgia - Alternatives for Conservation and Restoration. *Publications.* Paper 15. http://tigerprints.clemson.edu/ag_pubs/15.

16 – Center for Food Safety (cont.)

DOE Response

CFS Contaminating Wild Report (2006) Contaminating the Wild? Gene Flow from Experimental Field Trials of Genetically Engineered Crops Related to Wild Plants, author Doug Gurian-Sherman. http://www.centerforfoodsafety.org/files/contaminating_the_wild_report_41399.pdf.

CFS Monarch ESA Petition (2014) Petition to protect the monarch butterfly (*Danaus plexippus plexippus*) under the Endangered Species Act. Submitted to Secretary of the US Department of the Interior, by The Center for Biological Diversity and Center for Food Safety, joined by The Xerces Society for Invertebrate Conservation and Dr. Lincoln Brower, on August 26th, 2014. http://www.centerforfoodsafety.org/files/monarch-esa-petition-final_77427.pdf.

CFS Monarch Report (2015) Monarchs in Peril: Herbicide-Resistant Crops and the Decline of Monarch Butterflies in North America. http://www.centerforfoodsafety.org/files/cfs-monarch-report_2-4-15_design_05341.pdf.

CFS Monarch Report Summary (2015) Executive Summary - Monarchs in Peril: Herbicide-Resistant Crops and the Decline of Monarch Butterflies in North America. http://www.centerforfoodsafety.org/files/monarch_es_82936.pdf.

CFS Pine PR (2015) New Genetically Engineered Tree to Avoid Federal Oversight Completely: USDA Refuses to Regulate or Assess GE Tree. http://www.centerforfoodsafety.org/press-releases/3713/new-genetically-engineered-tree-to-avoid-federal-oversight-completely.

CFS GE Tree Report (2013) Genetically Engineered Trees: The New Frontier of Biotechnolgy. http://www.centerforfoodsafety.org/files/ge_pages_final_nov-1_80728.pdf.

CFS RFS Comments (2014) Comments to U.S. Environmental Protection Agency regarding 2014 Standards for the Renewable Fuel Standard Program Docket No. EPA-HQ-OAR-2013-047. http://www.centerforfoodsafety.org/files/epa-renewable-fuel-standard-rule--cfs-comments-1-28-14_21098.pdf .

17 – U.S. Environmental Protection Agency	DOE Response

3/23/2015 EPA Comment Letter - Engineered High Energy Crop (EHEC) Programs Draft Programmatic EIS

From: "Rountree, Marthea" <Rountree.Marthea@epa.gov>
Subject: EPA Comment Letter - Engineered High Energy Crop (EHEC) Programs Draft Programmatic EIS
Date: Tue, March 17, 2015 12:45 pm
To: "Jonathan.Burbaum@hq.doe.gov" <Jonathan.Burbaum@hq.doe.gov>,"comments@engineeredhighenergycropsPEIS.com" <comments@engineeredhighenergycropsPEIS.com>

Dr. Burbaum,

Attached is EPA's comment letter on the High Energy Crop PEIS. We appreciated the opportunity to review and comment. Please do not hesitate to contact me if you have any questions.

Regards,

Marthea Rountree

Marthea Rountree

Environmental Protection Agency

Office of Federal Activities

NEPA Compliance Division

1200 Pennsylvania Ave., N.W.

Room 7239A ARS: MC 2252A

Washington, DC 20460

Phone 202-564-7141/Fax 202-564-0072

Email: Rountree.Marthea@epa.gov

Attachments:
untitled-[1.1].plain

https://box443.bluehost.com:2096/cpsess9461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=19... 1/2

17 – U.S. Environmental Protection Agency (cont.)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 17 2015

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

Dr. Jonathan Burbaum, Program Director
Advanced Research Projects Agency – Energy (ARPA-E)
U.S. Department of Energy
ATTN: EHEC PEIS
1000 Independence Avenue SW
Mailstop-950-8043
Washington, DC 20585

Dear Dr. Burbaum:

17-1 In accordance with our responsibilities under Section 309 of the Clean Air Act, the National Environmental Policy Act (NEPA), and the Council on Environmental Quality's (CEQ) NEPA regulations, the Environmental Protection Agency (EPA) has reviewed the Department of Energy's (DOE) Engineered High Energy Crop Programs Draft Programmatic Environmental Impact Statement (PEIS), (CEQ # 20150009).

DOE's Advanced Research Projects Agency-Energy (ARPA-E) is considering a proposed action to implement one or more programs to catalyze the development and demonstration of engineered high energy crops (EHECs) through confined field trials in the Southeastern United States. Energy crops are crops grown specifically for their biomass or fuel value. A main component of the proposed EHEC Program would be DOE or other Federal or state agencies providing financial assistance for confined field trials to evaluate the performance of EHECs that will facilitate commercial development and deployment of biofuels. This draft PEIS addresses environmental impacts and issues at a broad, program level, and identifies a geographic area within which future proposed field trails may occur. It also identifies broad mitigation measures and best management practices that can be considered in future tiered NEPA reviews and possibly implemented during field trials. The geographic scope is limited to existing croplands, pasturelands, and forested areas. In addition, the draft PEIS focuses only on EHECs that are not food crops.

Internet Address (URL) ● http://www.epa.gov
Recycled/Recyclable ● Printed with Vegetable Oil Based Inks on 100% Postconsumer, Process Chlorine Free Recycled Paper

DOE Response

17-1: Thank you for your comments.

17 – U.S. Environmental Protection Agency (cont.)

DOE Response

Our review has not identified any potential environmental impacts requiring substantive changes and we are rating the proposal as Lack of Objections ("LO") (see enclosed rating sheet). We appreciate the opportunity to review and comment on this document. If you have any further questions you may contact me or have your staff contact Marthea Rountree. She can be reached at (202) 564-7141.

Sincerely,

Susan E. Bromm
Director
Office of Federal Activities

Enclosure

2

17 – U.S. Environmental Protection Agency (cont.) | **DOE Response**

SUMMARY OF EPA RATING SYSTEM

Rating the Environmental Impact of the Action

- **LO (Lack of Objections)** The review has not identified any potential environmental impacts requiring substantive changes to the preferred alternative. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposed action.
- **EC (Environmental Concerns)** The review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact.
- **EO (Environmental Objections)** The review has identified significant environmental impacts that should be avoided in order to adequately protect the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). The basis for environmental objections can include situations:
  1. *Where an action might violate or be inconsistent with achievement or maintenance of a national environmental standard;*
  2. *Where the Federal agency violates its own substantive environmental requirements that relate to EPA's areas of jurisdiction or expertise;*
  3. *Where there is a violation of an EPA policy declaration;*
  4. *Where there are no applicable standards or where applicable standards will not be violated but there is potential for significant environmental degradation that could be corrected by project modification or other feasible alternatives; or*
  5. *Where proceeding with the proposed action would set a precedent for future actions that collectively could result in significant environmental impacts.*
- **EU (Environmentally Unsatisfactory)** The review has identified adverse environmental impacts that are of sufficient magnitude that EPA believes the proposed action must not proceed as proposed. The basis for an environmentally unsatisfactory determination consists of identification of environmentally objectionable impacts as defined above and one or more of the following conditions:
  1. *The potential violation of or inconsistency with a national environmental standard is substantive and/or will occur on a long-term basis;*
  2. *There are no applicable standards but the severity, duration, or geographical scope of the impacts associated with the proposed action warrant special attention; or*
  3. *The potential environmental impacts resulting from the proposed action are of national importance because of the threat to national environmental resources or to environmental policies.*

Adequacy of the Impact Statement

- **Category 1 (Adequate)** The draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.
- **Category 2 (Insufficient Information)** The draft EIS does not contain sufficient information to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the proposal. The identified additional information, data, analyses, or discussion should be included in the final EIS.
- **Category 3 (Inadequate)** The draft EIS does not adequately assess the potentially significant environmental impacts of the proposal, or the reviewer has identified new, reasonably available, alternatives, that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. The identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. This rating indicates EPA's belief that the draft EIS does not meet the purposes of NEPA and/or the Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS.

18 – Global Justice Ecology Project

From: "Sara Sullivan" <sara@globaljusticeecology.org>
Subject: Engineered High Energy Crop Programs Programmatic Environmental Impact Statement (EHEC PEIS)
Date: Tue, March 17, 2015 4:18 pm
To: comments@engineeredhighenergycropsPEIS.com

To: US Department of Energy

Re: Engineered High Energy Crop Programs Programmatic Environmental Impact Statement (EHEC PEIS)

18-1 Prepared by Dr. Rachel Smolker (Biofuelwatch) and Anne Petermann (Global Justice Ecology Project) with signatures from 1022 supporters

[See attached PDF for signatures]

The program that DOE seeks to establish, which would provide support for field trials of engineered high energy crops/trees, is a wasteful diversion of taxpayer dollars, money that should be spent instead on protection of soil water and other resources in the region which are already depleted and spiraling downward with expanding development and the current and anticipated impacts of climate change, including droughts, potential severe wildfires, floods and runoff etc.

DOE and cooperating agencies have conveniently ignored the already substantial literature indicating that very unrealistically large areas of land, water and nutrients are required to produce sufficient supplies of biomass to contribute even a very small fraction to the overall energy mix [1].

This has been openly acknowledged by, for example, the IPCC [2] as well as many peer reviewed articles on direct and indirect land use impacts of large scale bioenergy (a sample provided below in footnote).

18-2 Engineered crops may at best slightly increase yields, but not by enough to alter the fundamental fact that biofuels entail very large environmental and other costs for a very small return. This is clear even at current scales of biofuel production which have resulted in serious environmental consequences as well as impacting on food production (which occurs no matter what crop is grown as all crops require soil, nutrients and water). Competing land uses ultimately, either directly or indirectly, impact food production, unwise at a time when expanding population is dependent upon dwindling soil and water resources. There is little potential to expand agricultural frontiers except at cost to biodiverse ecosystems that are already alarmingly diminished.

DOE Response

18-1: Thank you for your comments.

18-2: As described in Section 1.3, the conversion of corn starch and other crops into ethanol as a biofuel does not satisfy the challenge set by the Federal government. Energy crop research programs experimenting with a variety of plants that are non-cellulose sources, more efficiently grown, and easily extracted as a biofuel may be an advance in the environmentally responsible deployment of biofuels. There is a need for DOE or other Federal agency funding and support for EHEC Programs, without which scientific understanding and innovation in the responsible use of EHECs and deployment of EHECs would not develop at all or would develop more slowly. The purpose for agency action is for DOE to take action to catalyze the development and deployment of EHECs.

18 – Global Justice Ecology Project (cont.)

18-2 cont. Given all of the above, why invest in risky field testing of GMOs when it is already clear that the future potential for biofuels contribution is very small and the environmental consequences are very large?

Furthermore, why undertake the risks of field testing genetically engineered EHECs when:

18-3

a) contamination simply cannot be prevented even with proposed "best management" practices.

b) there is no clear indication how contamination is "to be avoided", nor how monitoring and reporting will be undertaken, nor what will be done if contamination is discovered.

c) Public opinion is very strongly opposed to commercial release of GMO trees, hence field trials hold no future promise and shouldn't be undertaken in the first place.

d) Public opinion towards non tree GMO crops is also largely negative (witness GMO labeling law processes across the country).

e) The characteristics being "engineered" for EHECs very closely overlap the characteristics that lead to invasiveness: hardiness, fast growth, resistance to stressors etc.

Why establish a program whose ultimate goal is to develop viable engineered biofuel crops that would need to be grown in massive scale in the southeastern USA, a region that is already experiencing serious impacts from climate change, anticipated to worsen. Those include droughts, water shortages, biodiversity losses and wildfires, all of which will only be exacerbated by EHEC crops/trees.

Fertilizers used to grow EHECs will further contribute to degradation of waterways in the region, and also result in potentially very large quantities of nitrous oxide (potent greenhouse gas) emissions. (Those alone can render biofuels more damaging to climate than their fossil fuel counterparts.)

18-4 Increased use of pesticides, herbicides and other chemicals will result in worsening toxic exposure and health impacts to humans and animals in the region should the testing results from this program lead ultimately, as is anticipated, to widescale planting of EHECs.

18-5 DOE "public consultation" on this proposed program is woefully inadequate and not representative. Public opinion with regards to biofuels has dramatically soured with growing awareness of the consequences and costs.

DOE Response

18-3: Section 4.5 has been revised to identify that given the size of the field trials for Alternatives 2 and 3, the potential for invasiveness could be minor to moderate adverse impacts. Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on invasiveness, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. The ability to regulate the release of novel interspecific hybrids falls under the regulatory authority of USDA APHIS, not DOE. DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permits for a proposed EHEC project.

18-4: Sections 4.3 and 4.5 have been revised to indicate that DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permit for a proposed EHEC project. The ability to regulate the release of novel interspecific hybrids – and specific BMPs – falls under the regulatory authority of USDA APHIS, not DOE.

18-5: As required by NEPA, and described in Section 1.6, DOE conducted in-person and web-based public scoping meetings and Draft PEIS public hearings with notifications published on the project website, local newspapers for the meetings, and in the Federal Register. In addition, email notices were submitted to over 300 individuals.

18 – Global Justice Ecology Project (cont.) | **DOE Response**

[1] Literature examples:

Giampietro, Mario, Sergio Ulgiati and David Pimentel (1997), *Feasibility of Large-Scale Biofuel Production*, BioScience, Vol. 47, No. 9 (October), pp. 587-600

Unintended Environmental Consequences of a Global Biofuels Program, Jerry M. Melillo et al, MIT Joint Program on the Science and Policy of Global Change, Report No. 168, January 2009, www.calepa.ca.gov/cepc/2010/AsltonBird/AppAEx13.pdf

PJ Crutzen *et al*, 2007. N2O release from agro-biofuel production negates global warming reduction by replacing fossil fuels. *Atmos. Chem. Phys. Discuss*, 7, 11191

[2] IPCC Fifth Assessment Working Group III (Mitigation) report, 2014: "*The production of bioenergy crops to mitigate climate change leads to land conversion (e.g., from food crops and unmanaged ecosystems to energy crops; [high confidence]) and in some scenarios, reduced food security as well as additional greenhouse gas emissions over the course of decades or centuries*" (Ch 19).

Patzek 2010. A Probabilistic Analysis of the Switchgrass Ethanol Cycle, *Sustainability* 2010, *2*, 2734-2769; doi:10.3390/su2092734

Implications of Limiting CO2 Concentrations for Land Use and Energy, Marshall Wise et al, Science 324, 1183, May 2009.

World Resources Institute 2015: Avoiding bioenergy competition for food crops and land.

Sara Sullivan
Assistant Director
Global Justice Ecology Project
266 Elmwood Ave, Suite 307
Buffalo, NY 14222 USA

+1.716.931.5833

18 – Global Justice Ecology Project (cont.) **DOE Response**

First Name	Name (Last)	Organization	Email	City	State/Province	Country
Dugald	Ferguson		dugaldf@hotmail.com	Norwich	norfolk	UK
Christie	Childs		peekosanchez@gmail.com	Eureka	CA	USA
Juliana	Weiser		jweiser59@yahoo.com	Grand Junction	Colorado	USA
Jo	Mirek		j.mirek1@ntlworld.com	Welwyn Garden City	Herts	United Kingdom
Helen	Wilson		hwilson6790@gmail.com	Penacook	NH	USA
Julie	Nieset		jenieset@gmail.com	Urbana	IL	United States
Patrice	Zboya		pzboya654@mygsc.com	Penacook	NH	USA
Tony	Masiuk		tony.masiuk@gmail.com	edmonton	AB	Canada
Robert	Robertson		rbr88@yahoo.com	perry	FL	Taylor
Bridgete	Robertson		rbr8825@yahoo.com	perry	Fl	USA
C	J		John0700@hotmail.com	Mpls	Mn	USA
Nansea	Tomalty		drtomalty@gmail.com	Antigonish	NS	Canada
Tina	Visser		vissertina@rocketmail.com	Fort Simpson	NT	Canada
Katherine	Philipson		kphilipson1@gmail.com	Washington	District of Columbia	United States
CHRISTINA	RESENDE		CHRISAR66@GMAIL.COM	MIAMI	FL	USA
Michelle	Law		chell694@yahoo.com	Scottsville	Kentucky	USA
Sheila	Pratt		shpr@vcn.bc.ca	Maple Ridge	BC	Canada
Alisa	Battaglia		innerdiamond@bellsouth.net	weston	fl	USA
Debbie	Blair		debbiesblair@yahoo.com	Boca Raton	FL	United States
Jennifer	Shanks		magick70@yahoo.com	Camarillo	CA	United States
Zette	Harbour		zette@zetteharbour.com	Los Osos	California	United States
Marion	Midgley		georgemidgley@sbcglobal.net	Bedford	TX	USA
Aletha		Free Soil Party	editor@freesoil.org	Los Angeles	CA	USA
Erica	Andrus		eandrus@uvm.edu	Vergennes	vt	USA
karl	novak		kavon95@gmavt.net	hinesburg	vt	usa
Aven	Fisher		avenfisher@gmail.com	Halifax	Nova Scotia	Canada
Mark	Wachowiak		anarchistchefdude@gmail.com	Orlando	Florida	USA
Judith	Green		jmeao9@q.com	Bellingham	Wa	USA
Shirley	Thunder Horse		shirley.thunder@maine.edu	Lovell	Maine	USA
Melinda	Suelflow		melinda@organicconsumers.org	Finland	mn	USA
Liz	Hightower		elizadupl@hotmail.com	Fort Wayne	INDIANA	United States
Virginia	Bormann		ginnyb56@gmail.com	Sun Prairie	WI	USA
Debbie	King		debbieking999@comcast.net	Little Rock	Arkansas	USA
Barbara	Vieira		edv710@outlook.com	Staten Island	NY	United States
C.	Benedict		goldenfoxwe@hotmail.com	Renton	WA	USA
Jacquelyn	Dyer		jacquelyn_dyer1@yahoo.com	Orleans	Ca	Usa
james	gough	OHTN & OAN	jamesgsud@hotmail.com	sudbury	ontario	canada
Lauren	Davis		Lauren@laurenbdavis.com	PRINCETON	New Jersey	United States
Margaret	Marlowe		mmarlowe@austin.rr.com	Leander	TX	United states of america
Gina	Hart		ginamhart@gmail.com	Maryland Heights	MO	United States
Lucas	Sharkey Pearce	Ursa / Two Brothers	ground.gained@gmail.com	Toronto	Ontario	Canada
Sharon	Putnam		conomatic1917@yahoo	North Springfield	Vermont	US
nicholas	Buchart		onebatkins@yahoo.com	Duncan	BC	Canada
Ben Oscar	Andersson		oscarsito1057@wildmail.com	My Hometown	Illinois	United States
Sabine	Ehrenfeld		sehrenfeld11@gmail.com	Northridge	CA	United States
sam	bradley		mb2338@gmail.com	sterling hgts	mi	usa
Eric	Stringer		xsentrych@gmail.com	Shawnee	OK	United States
elisha	Belmont		e@monkeywrench.com	mckinleyville	CA	United States

19 – Private Citizen	DOE Response
3/23/2015 cancel plans to use GE trees for bioenergy From: "Ravi Grover" <avatar11@rediffmail.com> Subject: cancel plans to use GE trees for bioenergy Date: Fri, March 20, 2015 1:55 pm To: "comments@engineeredhighenergycropsPEIS.com" <comments@engineeredhighenergycropsPEIS.com> 19-1 Please do not support any programs that use genetically engineered crops/trees for energy. This is a wasteful use of taxpayer dollars, money that should be spent instead on protection of soil water and other resources. Thank you, Ravi Grover Get your own FREE website, FREE domain & FREE mobile app with Company email. **Know More >** Attachments: untitled-[1].plain Size: 0.2 k Type: text/plain https://box443.bluehost.com:2096/cpsess9461162358/3rdparty/squirrelmail/src/printer_friendly_bottom.php?passed_ent_id=0&mailbox=INBOX&passed_id=22... 1/1	**19-1:** Thank you for your comment.

20 – South Carolina Department of Natural Resources	DOE Response

South Carolina Department of
Natural Resources

1000 Assembly Street Suite 336
PO Box 167
Columbia, SC 29202
803.734.3282 Office
803.734.9809 Fax
mixong@dnr.sc.gov

Alvin A. Taylor
Director
Robert D. Perry
Director, Office of
Environmental Programs

March 17, 2015

Dr. Jonathan Burbaum, Program Director
Advanced Research Projects Agency-Energy (ARPA-E)
U.S. Department of Energy
ATTN: EHEC PEIS
1000 Independence Avenue, SW, Mailstop-950-8043
Washington, DC 20585

REFERENCE: Engineered High Energy Crop Programs
Draft Programmatic Environmental Impact Statement

Dear Dr. Burbaum:

Personnel with the South Carolina Department of Natural Resources (SCDNR) have reviewed the Draft Programmatic Environmental Impact Statement (PEIS) and offer the following comments.

20-1 The U.S. Department of Energy (DOE) Advanced Research Projects Agency-Energy (ARPA–E) prepared this Draft Programmatic Environmental Impact Statement (PEIS) to evaluate the potential environmental impacts of the Proposed Action to develop and implement one or more programs to catalyze the research, development, and demonstration of engineered high energy crops (EHECs) in the Southeastern United States. EHECs are agriculturally-viable photosynthetic species containing genetic material that have been intentionally introduced through biotechnology, interspecific hybridization, or other engineering processes (excluding processes that occur in nature without human intervention), and specifically engineered to increase energy production independent of increasing the amount of biomass by producing fuel molecules that can be introduced easily into existing energy infrastructure. EHECs are stated to present a promising renewable energy source that, by virtue of biological carbon capture, has a reduced carbon life-cycle, decreasing the production of greenhouse gases and allowing for domestic production of renewable fuels. A main component of the proposed EHEC Programs would be DOE or other Federal or state agencies providing financial assistance for confined field trials to evaluate the performance of EHECs that will facilitate the commercial development and deployment of biofuels. Confined field trials may range in size and could include a development scale of up to 5 acres (Alternative 1), a pilot scale of up to 250 acres (Alternative 2), or a demonstration scale of up to 15,000 acres (Alternative 3). A No-Action Alternative will also be considered. Under each alternative, up to 10% of the existing cropland (including pastureland and forested areas) could be converted to EHEC confined trials each year in each county. The total amount of cropland that could be converted into EHECs (perennial herbaceous, annual herbaceous and woody crops) in any given county is limited to 25%.

20-2 SCDNR is concerned that the proposed project will negatively impact wildlife and wildlife habitat. The Draft PEIS states that *negligible to minor adverse impacts to wildlife and non-native species are*

20-1: Thank you for your comments.

20-2: Section 4.5 has been revised to expand on the need for future site- and plant-specific environmental reviews, including NEPA reviews, to determine the presence of plants, wildlife, listed species, or critical habitats. In addition, surveys of the project area may be warranted to identify the potential of listed species or habitats on an individual parcel of land proposed as a field trial location.

20 – South Carolina Department of Natural Resources (cont.)

20-2 cont. *anticipated* (p. S-ix). However, the DEA also admits that *there is little scientific literature concerning the effects of EHEC plantings on wildlife and wildlife habitat (p. 4-20).* SCDNR submits that the proposed project could have more than minor adverse impacts due to the stated potential conversion of up to 25% of the existing cropland, pastureland and forested areas in a county, some of which is also high-quality wildlife habitat, to a non-native monoculture. This loss of habitat will be particularly acute for early successional species if this conversion targets existing cropland, expiring CRP acreage, or fallow cropland as proposed. The conversion of fallow croplands and timberlands will also represent a net loss of wildlife habitat.

20-3 SCDNR has concerns regarding the potential for many of the proposed EHEC species to be invasive. The Draft PEIS states that *negligible to no impacts are anticipated from the introduction or establishment of invasive species with the proper best management practices (BMPs) in place (p. S-ix).* SCDNR submits that the proposed project could have more than negligible impacts due to the stated potential conversion of up to 25% of the existing cropland, pastureland and forested areas in a county to non-native, potentially invasive species.

20-4 In addition, some of the proposed BMPs present a concern, particularly the potential for wildlife toxicity issues associated with the proposed use of multiple pesticides with different modes of action.

20-5 SCDNR also has concerns regarding the increased potential for wildfires associated with the proposed actions. The Draft PEIS states that *major or long-term mitigable to minor adverse impacts could occur under this alternative due to the increased size of the field trials, which would increase the potential for wildfires. Given the increased size of the field trials BMPs would be recommended as mitigation.*

20-6 SCDNR submits that the proposed project could significantly increase the potential for wildfires in some areas whether or not BMPs are implemented.

Based on the information provided, SCDNR recommends the selection of the No Action Alternative in South Carolina at this time. If a Proposed Action Alternative is selected, SCDNR recommends that project impacts are minimized through the implementation of Alternative 1 in South Carolina.

We appreciate the opportunity to review this Draft Programmatic Environmental Impact Statement (PEIS) and provide these comments. Please contact me at (803)734-3282 or mixong@dnr.sc.gov if you have any questions or if more information is needed.

Sincerely,

Greg Mixon
Inland Environmental Coordinator

DOE Response

20-3: DOE reviewed concerns related to the potential for invasiveness. Section 4.5 has been revised to identify that given the size of the field trials for Alternatives 2 and 3, the potential for invasiveness could be minor to moderate adverse impacts. DOE or another Federal agency proposing a Federal action related to an EHEC Program would be required to complete environmental reviews, such as NEPA reviews, for site- and plant-specific projects.

20-4: Sections 4.3 and 4.5 have been revised to indicate that, when possible, depending on the proposed EHEC species, DOE or another Federal agency would require the action proponent or recipient of a grant or permit to avoid and minimize the use of herbicides and pesticides to the extent practicable.

20-5: As stated in Section 4.7, the average terpene content in loblolly pine core samples ranges from >1% to 2.3%. Studies indicate that pine trees can naturally produce 3% to 5% terpene content. A proposed EHEC may try to reach the upper limits of this percentage (5%) for terpene storage, which is not outside the norm of terpene content found in nature.

20-6: Section 4.5 has been revised to note that the Federal agency proposing an action related to an EHEC Program would be required to complete environmental compliance reviews, such as NEPA reviews, for site- and plant-specific projects to identify potential impacts. Future project-specific environmental reviews would be required prior to the proposed EHEC field trial plot selection. It is anticipated that the project-specific environmental reviews would provide information on wildfire potential, in addition to identifying potential BMPs – tailored to each proposed EHEC project – to meet USDA APHIS BRS regulatory requirements. DOE or another Federal agency may require a recipient to implement appropriate BMPs as a condition of receiving funding or permits for a proposed EHEC project.

Appendix C: Draft PEIS Public Hearing Materials

CONTENTS

January 16, 2015 Notice of Availability of Draft Programmatic Environmental Impact Statement for Engineered High Energy Crop Programs, Southeastern States and Public Hearings C-2

Washington Post Advertisement Announcing Public Hearings C-3

Washington Post: Express Advertisement Public Hearings.....C-4

Guide to Participating in Public Hearings …….....C-6

Posters for Public Hearings.....C-6

Presentation for Public Hearings.....C-12

2404 **Federal Register** / Vol. 80, No. 11 / Friday, January 16, 2015 / Notices

Format (PDF). To use PDF, you must have Adobe Acrobat Reader, which is available free at this site.

You may also access documents of the Department published in the **Federal Register** by using the article search feature at: *www.federalregister.gov.* Specifically, through the advanced search feature at this site, you can limit your search to documents published by the Department.

Dated: January 12, 2015.

Michael K. Yudin,

Acting Assistant Secretary for Special Education and Rehabilitative Services.

[FR Doc. 2015–00605 Filed 1–15–15; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF ENERGY

Engineered High Energy Crop Programs Draft Programmatic Environmental Impact Statement, Southeastern United States

AGENCY: Department of Energy.

ACTION: Notice of availability and public hearings.

SUMMARY: The U.S. Department of Energy (DOE) Advanced Research Projects Agency-Energy (ARPA–E) announces the availability of the Engineered High Energy Crop (EHEC) Programs Draft Programmatic Environmental Impact Statement (or Draft PEIS) (DOE/EIS–0481). DOE also announces one in-person public hearing to be held in Washington, DC, and two Web-based public hearings, to receive comments on the Draft PEIS. The Draft PEIS evaluates the potential environmental impacts associated with DOE's Proposed Action to implement one or more programs to catalyze the development and demonstration of crops specifically engineered for increased energy production. A main component of the proposed programs would be providing financial assistance to conduct field trials to test the effectiveness of EHECs in the Southeastern United States, specifically in Alabama, Florida (excluding the Everglades/Southern Florida coastal plain ecoregion), Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

DATES: Comments on the Draft PEIS Notice of Availability (NOA) will be accepted until March 17, 2015. During the public comment period, DOE will host one in-person public hearing and two Web-based public hearings to receive comments on the Draft PEIS. Comments submitted during this public comment period will be considered in preparation of a Final PEIS and used by DOE in its decision-making process for the Proposed Action. DOE will consider late comments to the extent practicable. DOE will conduct public hearings:

- February 17, 2015, from 5:00–7:00 p.m., at the Holiday Inn Washington Capitol, 550 C Street Southwest, Washington, DC 20024.
- February 24, 2015, from 2:00–4:00 p.m., Web-based.
- February 26, 2015, from 2:00–4:00 p.m., Web-based.

Information on how to register for the Web-based public hearings will be available on the DOE EHEC PEIS project Web site (See **ADDRESSES** section).

ADDRESSES: Written comments on the Draft PEIS may be submitted by any of the following methods:

- *EHEC Web site: http://engineeredhighenergycropsPEIS.com*
- *Email: comments@engineeredhighenergycropsPEIS.com*
- *Mail:* Dr. Jonathan Burbaum, Program Director, ARPA–E, U.S. Department of Energy, ATTN: EHEC PEIS, 1000 Independence Avenue SW., Mailstop-950–8043, Washington, DC 20585. Note: Comments submitted by U.S. Postal Service may be delayed by mail screening.

This NOA, the EPA NOA, and the Draft PEIS will be posted on the DOE NEPA Web site at *http://energy.gov/nepa.* These documents, and additional materials relating to this Draft PEIS, will also be available on the EHEC PEIS project Web site at: *http://engineeredhighenergycropsPEIS.com.*

FOR FURTHER INFORMATION CONTACT: For more information on the PEIS, contact Dr. Jonathan Burbaum, Program Director, by one of the methods described in the **ADDRESSES** section, or by telephone at (202) 287–5453. For general information on the DOE NEPA process, contact Carol Borgstrom, Director, Office of NEPA Policy and Compliance (GC–54), U.S. Department of Energy, 1000 Independence Avenue SW., Washington, DC 20585, or telephone at (202) 586–4600, voicemail at (800) 472–2756, or email at *askNEPA@hq.doe.gov.* Persons with disabilities who require alternative means for communication (Braille, large print, audio tape, etc.) should contact (800) 877–8339.

SUPPLEMENTARY INFORMATION: The EHEC PEIS (DOE/EIS–0481) is being prepared in accordance with NEPA (42 U.S.C. 4321 *et seq.*) requirements, the Council on Environmental Quality's NEPA regulations (40 CFR parts 1500–1508), and DOE's NEPA Implementing Procedures (10 CFR part 1021).

The Draft PEIS evaluates the potential environmental impacts of the Proposed Action and alternatives to develop and implement one or more programs to catalyze the research, development, and demonstration of EHECs in the Southeastern United States. EHECs are agriculturally-viable photosynthetic species containing genetic material that has been intentionally introduced through biotechnology, interspecific hybridization, or other engineering processes (excluding processes that occur in nature without human intervention), specifically engineered to increase the amount of energy produced per acre (*e.g.,* improving the photosynthetic process), without increasing the amount of biomass. These approaches are referred to in this PEIS as approaches "independent of increasing the amount of biomass." A main component of the proposed EHEC Programs would be DOE or other Federal or state agencies providing financial assistance for confined field trials to evaluate the performance of EHECs that could facilitate the commercial development and deployment of biofuels. The field trials would demonstrate the EHEC's biological and economic viability and further DOE ARPA–E's mission. Confined field trials may range in size and could include development scale (up to 5 acres), pilot scale (up to 250 acres), or demonstration scale (up to 15,000 acres). The Draft PEIS evaluates the potential environmental impacts of these scaled alternatives, which reflect the range of reasonable alternatives.

Signed in Washington, DC, this 12th day of January, 2015.

Jonathan Burbaum,

Program Director, Advanced Research Projects Agency-Energy.

[FR Doc. 2015–00601 Filed 1–15–15; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

Agency Information Collection Extension

AGENCY: Office of Energy Efficiency and Renewable, Energy Department of Energy.

ACTION: Notice and Request for OMB Review and Comment.

SUMMARY: The Department of Energy (DOE) has submitted to the Office of Management and Budget (OMB) for clearance, pursuant to the Paperwork Reduction Act of 1995, a three-year

Ad#11886420

PROOF OF PUBLICATION

The Washington Post

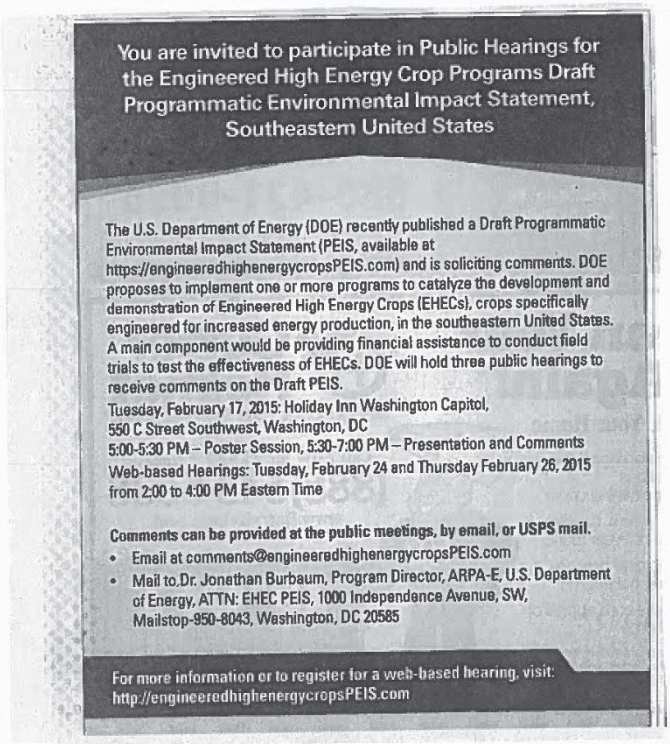
The Washington Post Company hereby certifies that it is the publisher of The Washington Post; that The Washington Post is a newspaper of general circulation, published daily in the City of Washington, District of Columbia; that The Washington Post has been so published continuously for more than one year prior to the date of first publication of the notice mentioned below; that the undersigned person is the duly authorized agent of The Washington Post Company to execute this certificate on its behalf; and that a notice of which the annexed is a true copy was printed and published in said newspaper on the following date (s) at a cost of $[redacted] and was circulated in the Washington metropolitan area.

Published 1 times. Date(s): 16 of February 2015

Witness my hand and official seal this 18th day of February 2015

My commission expires 10/31/2019

JENNIFER A. MITCHELL-JOHNSON NOTARY PUBLIC DISTRICT OF COLUMBIA MY COMMISSION EXPIRES 10/31/2019



You are invited to participate in Public Hearings for the Engineered High Energy Crop Programs Draft Programmatic Environmental Impact Statement, Southeastern United States

The U.S. Department of Energy (DOE) recently published a Draft Programmatic Environmental Impact Statement (PEIS, available at https://engineeredhighenergycropsPEIS.com) and is soliciting comments. DOE proposes to implement one or more programs to catalyze the development and demonstration of Engineered High Energy Crops (EHECs), crops specifically engineered for increased energy production, in the southeastern United States. A main component would be providing financial assistance to conduct field trials to test the effectiveness of EHECs. DOE will hold three public hearings to receive comments on the Draft PEIS.

Tuesday, February 17, 2015: Holiday Inn Washington Capitol, 550 C Street Southwest, Washington, DC
5:00-5:30 PM – Poster Session, 5:30-7:00 PM – Presentation and Comments
Web-based Hearings: Tuesday, February 24 and Thursday February 26, 2015 from 2:00 to 4:00 PM Eastern Time

Comments can be provided at the public meetings, by email, or USPS mail.

- Email at comments@engineeredhighenergycropsPEIS.com
- Mail to Dr. Jonathan Burbaum, Program Director, ARPA-E, U.S. Department of Energy, ATTN: EHEC PEIS, 1000 Independence Avenue, SW, Mailstop-950-8043, Washington, DC 20585

For more information or to register for a web-based hearing, visit: http://engineeredhighenergycropsPEIS.com

Ad#11886420

PROOF OF PUBLICATION

The Washington Post

The Washington Post Company hereby certifies that it is the publisher of The Washington Post; that The Washington Post is a newspaper of general circulation, published daily in the City of Washington, District of Columbia; that The Washington Post has been so published continuously for more than one year prior to the date of first publication of the notice mentioned below; that the undersigned person is the duly authorized agent of The Washington Post Company to execute this certificate on its behalf; and that a notice of which the annexed is a true copy was printed and published in said newspaper on the following date (s) at a cost of $[redacted] and was circulated in the Washington metropolitan area.

Published 1 time(s). Date(s): 17 of February 2015

Witness my hand and official seal this 18th day of February 2015

My commission expires 10/31/2019

JENNIFER A MITCHELL-JOHNSON NOTARY PUBLIC DISTRICT OF COLUMBIA MY COMMISSION EXPIRES 10/31/2019

You are invited to participate in Public Hearings for the Engineered High Energy Crop Programs Draft Programmatic Environmental Impact Statement, Southeastern United States

The U.S. Department of Energy (DOE) recently published a Draft Programmatic Environmental Impact Statement (PEIS, available at https://engineeredhighenergycropsPEIS.com) and is soliciting comments. DOE proposes to implement one or more programs to catalyze the development and demonstration of Engineered High Energy Crops (EHECs), crops specifically engineered for increased energy production, in the southeastern United States. A main component would be providing financial assistance to conduct field trials to test the effectiveness of EHECs. DOE will hold three public hearings to receive comments on the Draft PEIS.

Tuesday, February 17, 2015: Holiday Inn Washington Capitol, 550 C Street Southwest, Washington, DC
5:00-5:30 PM – Poster Session, 5:30-7:00 PM – Presentation and Comments
Web-based Hearings: Tuesday, February 24 and Thursday February 26, 2015 from 2:00 to 4:00 PM Eastern Time

Comments can be provided at the public meetings, by email, or USPS mail.

- Email at comments@engineeredhighenergycropsPEIS.com
- Mail to Dr. Jonathan Burbaum, Program Director, ARPA-E, U.S. Department of Energy, ATTN: EHEC PEIS, 1000 Independence Avenue, SW, Mailstop-950-8043, Washington, DC 20585

For more information or to register for a web-based hearing, visit: http://engineeredhighenergycropsPEIS.com

Guide to Participating in NEPA Public Hearings

Through the National Environmental Policy Act (NEPA) process, you have an opportunity to review the Department of Energy's (DOE), Advanced Research Projects Agency-Energy's (ARPA-E) Engineered High Energy Crop (EHEC) Programs Draft Programmatic Environmental Impact Statement (PEIS) and to provide timely information and comments to DOE on the Draft PEIS. DOE is holding a 60-day public comment period for this Draft PEIS. This handout outlines how you can participate and provide comments during the Draft PEIS comment period.

Public Comment Period: January 16 – March 17, 2015

Public Hearings

DOE is holding an in-person public hearing on February 17, 2015 from 5 to 7 p.m. ET at Holiday Inn Washington Capitol, 550 C Street Southwest, Washington, DC. Similar to the previously held scoping meetings, the public hearing will provide an opportunity for the public to provide verbal comments on the Draft PEIS. This public hearing is a drop-in event where you can come at any time and stay as long as like. The public hearing will provide an opportunity for the public to provide comments verbally in a large group setting or privately to a stenographer.

In addition, DOE is hosting several web-based public hearings on February 24th and February 26th from 2 to 4 p.m. ET.

Information about these hearings, webinar registration, and comment instructions are provided on the project website at: http://engineeredhighenergycropsPEIS.com.

How to Provide Comments

DOE requests your comments on the Draft PEIS and encourages the submission of scientific data, studies or research to support comments. The comment period to provide your comments on the Draft PEIS ends on March 17, 2015.

Your comments will be reviewed by DOE for consideration in development of the Final PEIS. All comments—written or verbal—will be considered equally.

You can provide comments in the following ways:

1. **In-person/Web-based Public Hearings:** Written and verbal comments accepted at each public hearing
2. **E-mail:** comments@engineeredhighenergycropsPEIS.com
3. **Online:** http://engineeredhighenergycropsPEIS.com/comments
4. **Mail:** Dr. Jonathan Burbaum, Program Director, ARPA-E, U.S. Department of Energy, ATTN: EHEC PEIS, 1000 Independence Avenue SW, Mailstop-950-8043, Washington, DC 20585

Reminder: Submit Draft PEIS comments by March 17, 2015

Engineered High Energy Crop (EHEC) Programs
Draft Programmatic Environmental Impact Statement (PEIS)

Project Overview

The Department of Energy (DOE), Advanced Research Project Agency-Energy (ARPA-E) has prepared a Draft PEIS to evaluate the potential environmental impacts of one or more programs to catalyze the development and demonstration of EHECs. EHEC crops are specifically designed for increased energy production. Examples of EHECs that may be assessed in the PEIS include those being investigated under ARPA-E's Plants Engineered to Replace Oil (PETRO) program such as genetically engineered varieties of camelina, loblolly pine, tobacco, giant cane, sugarcane, miscanthus, sorghum, and switchgrass. These plants are being engineered to increase photosynthesis or to create molecules already found in petroleum-based fuels.

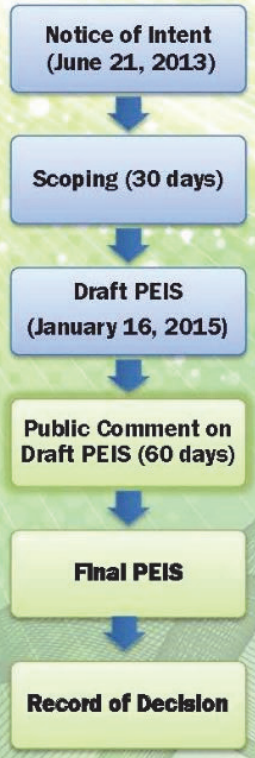
A main component of the EHEC programs would provide financial assistance to funding recipients for conducting confined field trials to test the effectiveness of EHECs. The field trials would range in size from development-scale (up to 5 acres), pilot-scale (up to 250 acres) or demonstration-scale (up to 15,000 acres). All necessary permits, such as from the U.S. Department of Agriculture's Animal and Plant Health Inspection Service, would be required before initiating confined field trials.

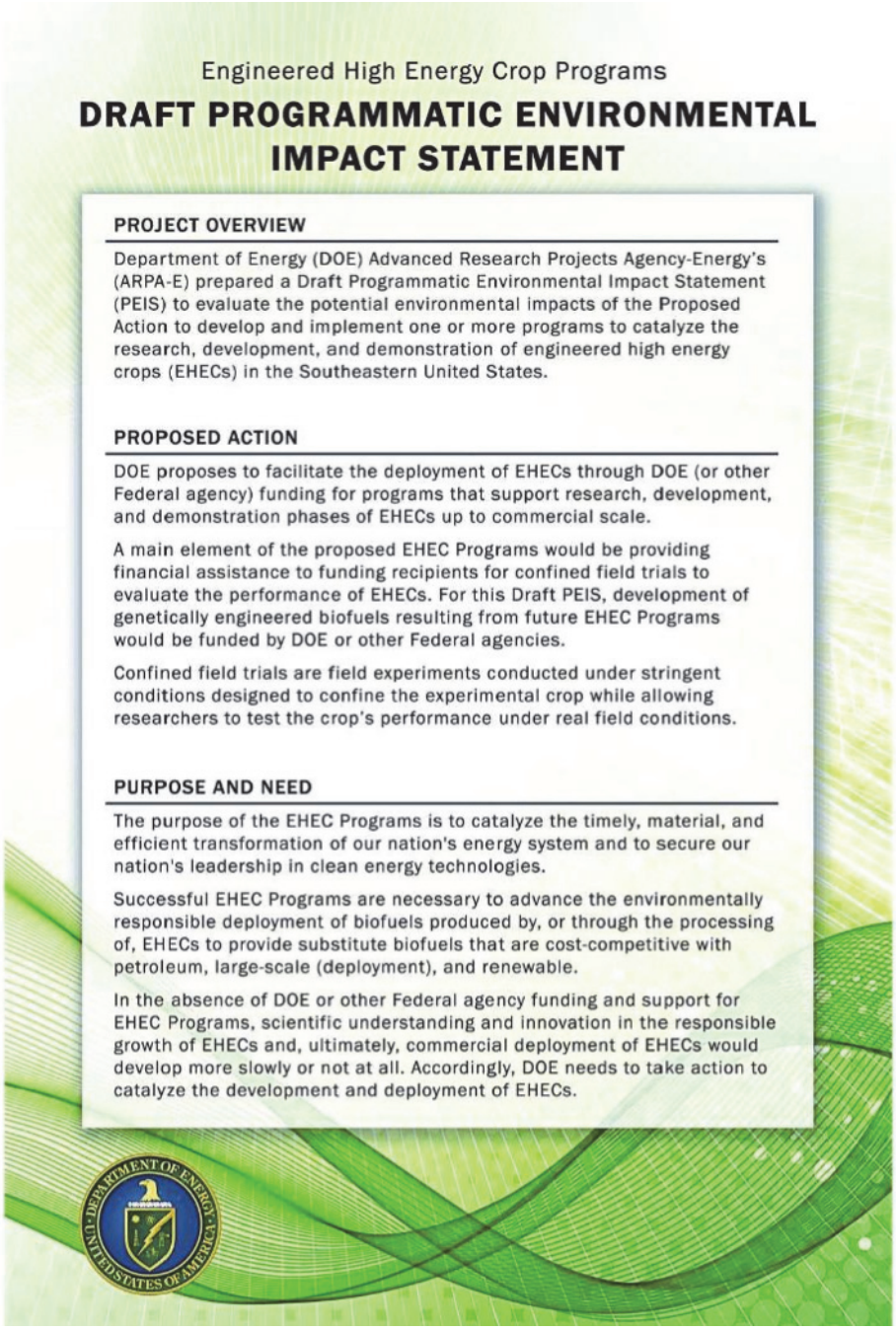
This Draft PEIS assesses the potential environmental impacts of confined field trials in the southeastern United States to include Alabama, Florida (excluding the Everglades/Southern Florida coastal plain ecoregion), Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. This geographic area was selected for its favorable climate and agricultural conditions for the cultivation of EHECs.

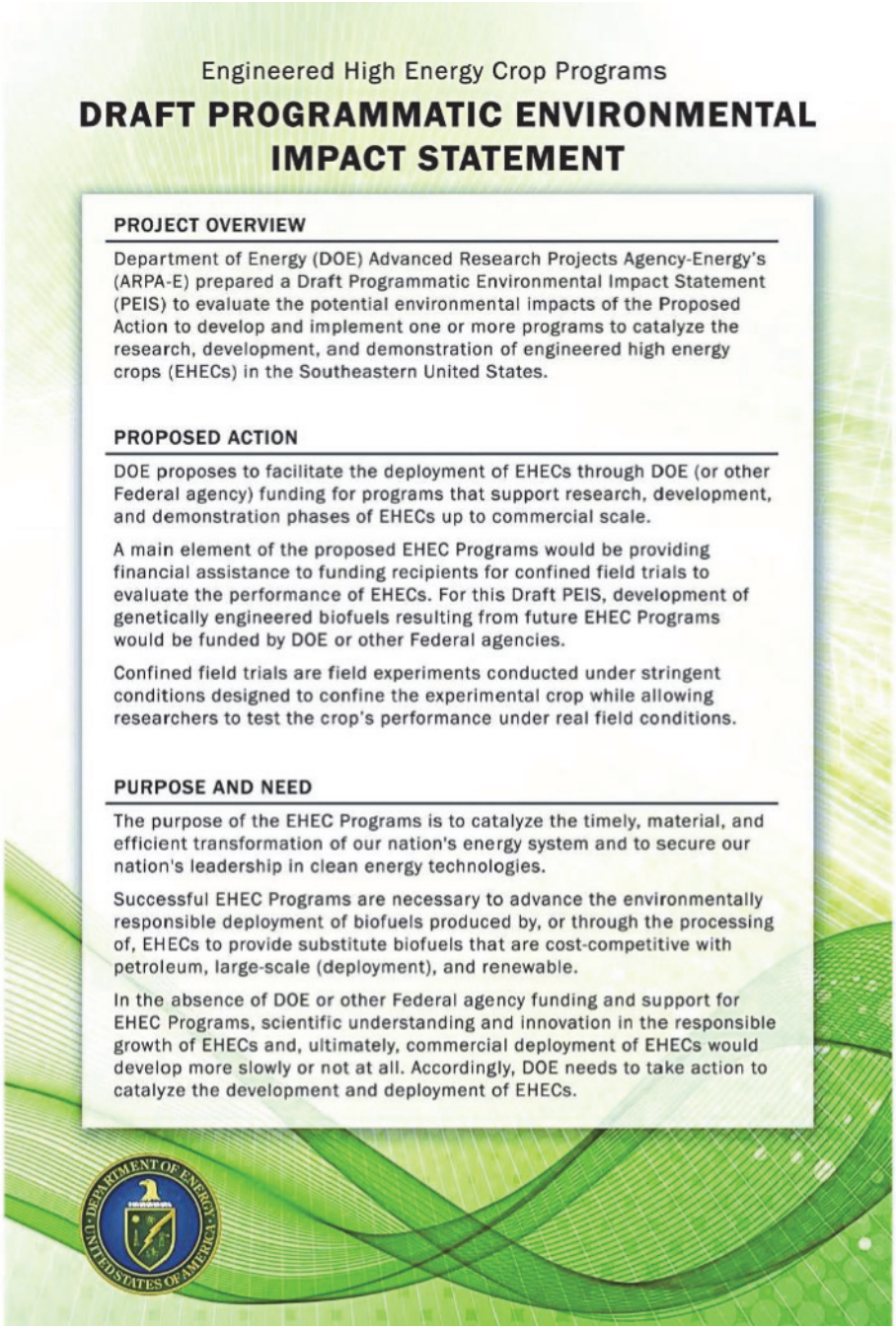
NEPA Process

The National Environmental Policy Act of 1969 (NEPA) requires that all Federal agencies consider the potential environmental impacts of their proposed actions. NEPA promotes better agency decision-making by ensuring that high quality environmental information is available to agency officials and the public before the agency decides whether and how to undertake a Proposed Action. To meet the NEPA requirements, a series of milestones must be met to develop and finalize a PEIS.

Currently, the EHEC Programs Draft PEIS is at the **Public Comment on Draft PEIS** phase. During this phase, the public, interest groups, and agencies at all levels of government are encouraged to provide feedback on the Draft PEIS. The Final PEIS will incorporate comments received on the Draft PEIS, as applicable. After publication of the Final PEIS, DOE will make the decision regarding the selection of an alternative within a Record of Decision.




Engineered High Energy Crop Programs
DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT
PROJECT OVERVIEW
Department of Energy (DOE) Advanced Research Projects Agency-Energy's (ARPA-E) prepared a Draft Programmatic Environmental Impact Statement (PEIS) to evaluate the potential environmental impacts of the Proposed Action to develop and implement one or more programs to catalyze the research, development, and demonstration of engineered high energy crops (EHECs) in the Southeastern United States.
PROPOSED ACTION
DOE proposes to facilitate the deployment of EHECs through DOE (or other Federal agency) funding for programs that support research, development, and demonstration phases of EHECs up to commercial scale.
A main element of the proposed EHEC Programs would be providing financial assistance to funding recipients for confined field trials to evaluate the performance of EHECs. For this Draft PEIS, development of genetically engineered biofuels resulting from future EHEC Programs would be funded by DOE or other Federal agencies.
Confined field trials are field experiments conducted under stringent conditions designed to confine the experimental crop while allowing researchers to test the crop's performance under real field conditions.
PURPOSE AND NEED
The purpose of the EHEC Programs is to catalyze the timely, material, and efficient transformation of our nation's energy system and to secure our nation's leadership in clean energy technologies.
Successful EHEC Programs are necessary to advance the environmentally responsible deployment of biofuels produced by, or through the processing of, EHECs to provide substitute biofuels that are cost-competitive with petroleum, large-scale (deployment), and renewable.
In the absence of DOE or other Federal agency funding and support for EHEC Programs, scientific understanding and innovation in the responsible growth of EHECs and, ultimately, commercial deployment of EHECs would develop more slowly or not at all. Accordingly, DOE needs to take action to catalyze the development and deployment of EHECs.
DEPARTMENT OF ENERGY
UNITED STATES OF AMERICA


Engineered High Energy Crop Programs
DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT
PROJECT OVERVIEW
Department of Energy (DOE) Advanced Research Projects Agency-Energy's (ARPA-E) prepared a Draft Programmatic Environmental Impact Statement (PEIS) to evaluate the potential environmental impacts of the Proposed Action to develop and implement one or more programs to catalyze the research, development, and demonstration of engineered high energy crops (EHECs) in the Southeastern United States.
PROPOSED ACTION
DOE proposes to facilitate the deployment of EHECs through DOE (or other Federal agency) funding for programs that support research, development, and demonstration phases of EHECs up to commercial scale.
A main element of the proposed EHEC Programs would be providing financial assistance to funding recipients for confined field trials to evaluate the performance of EHECs. For this Draft PEIS, development of genetically engineered biofuels resulting from future EHEC Programs would be funded by DOE or other Federal agencies.
Confined field trials are field experiments conducted under stringent conditions designed to confine the experimental crop while allowing researchers to test the crop's performance under real field conditions.
PURPOSE AND NEED
The purpose of the EHEC Programs is to catalyze the timely, material, and efficient transformation of our nation's energy system and to secure our nation's leadership in clean energy technologies.
Successful EHEC Programs are necessary to advance the environmentally responsible deployment of biofuels produced by, or through the processing of, EHECs to provide substitute biofuels that are cost-competitive with petroleum, large-scale (deployment), and renewable.
In the absence of DOE or other Federal agency funding and support for EHEC Programs, scientific understanding and innovation in the responsible growth of EHECs and, ultimately, commercial deployment of EHECs would develop more slowly or not at all. Accordingly, DOE needs to take action to catalyze the development and deployment of EHECs.
DEPARTMENT OF ENERGY
UNITED STATES OF AMERICA

Engineered High Energy Crop Programs

DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

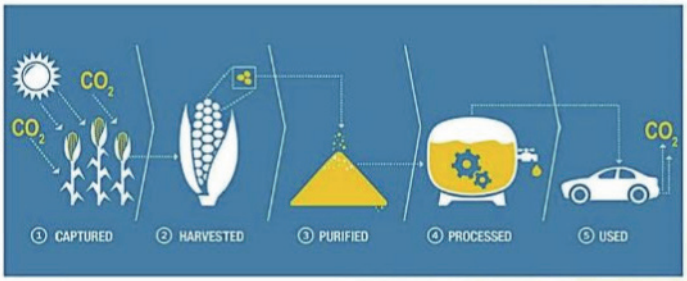
WHAT ARE ENGINEERED HIGH ENERGY CROPS?

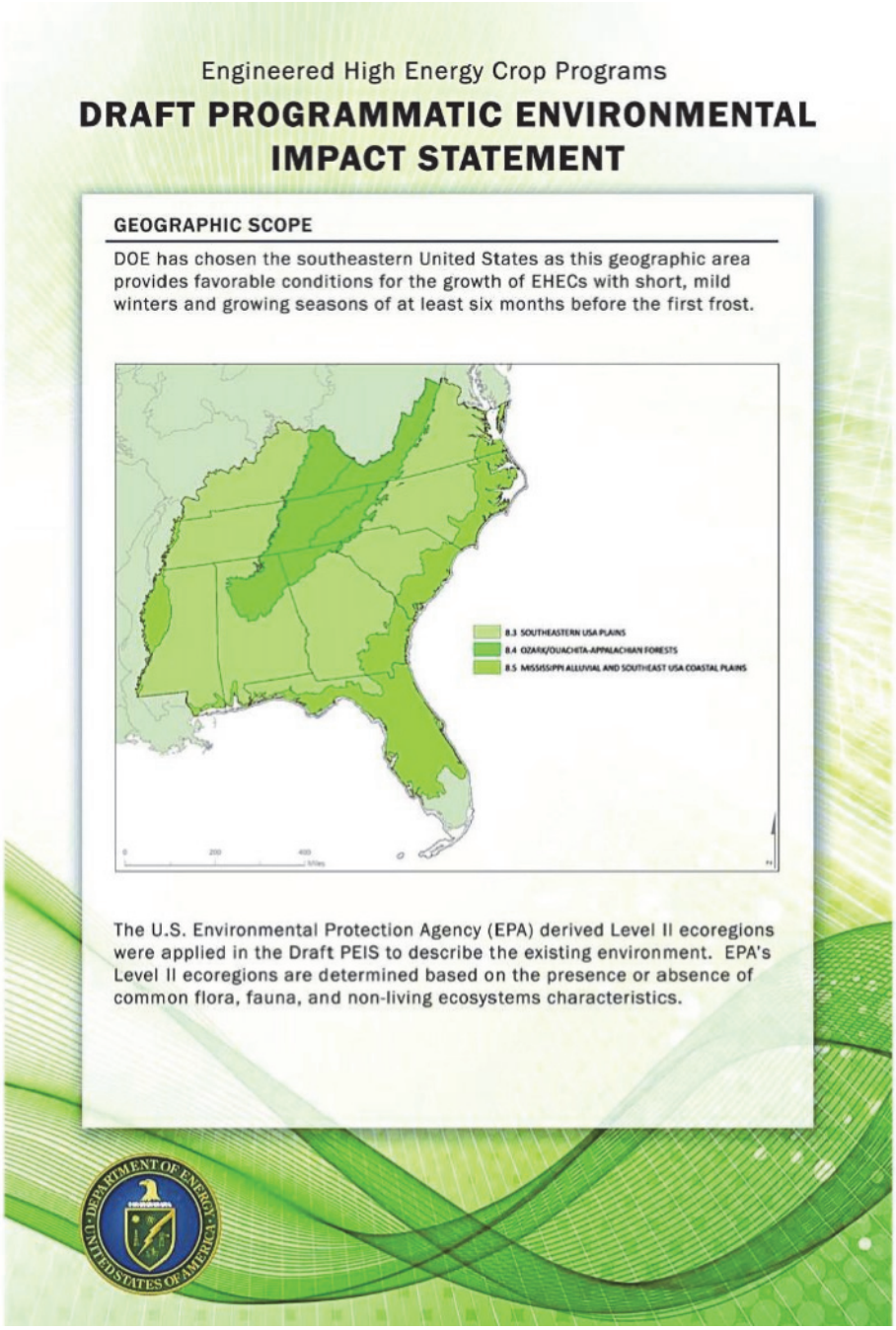
Engineered High Energy Crops (EHECs) are plants specifically engineered for increased energy production.

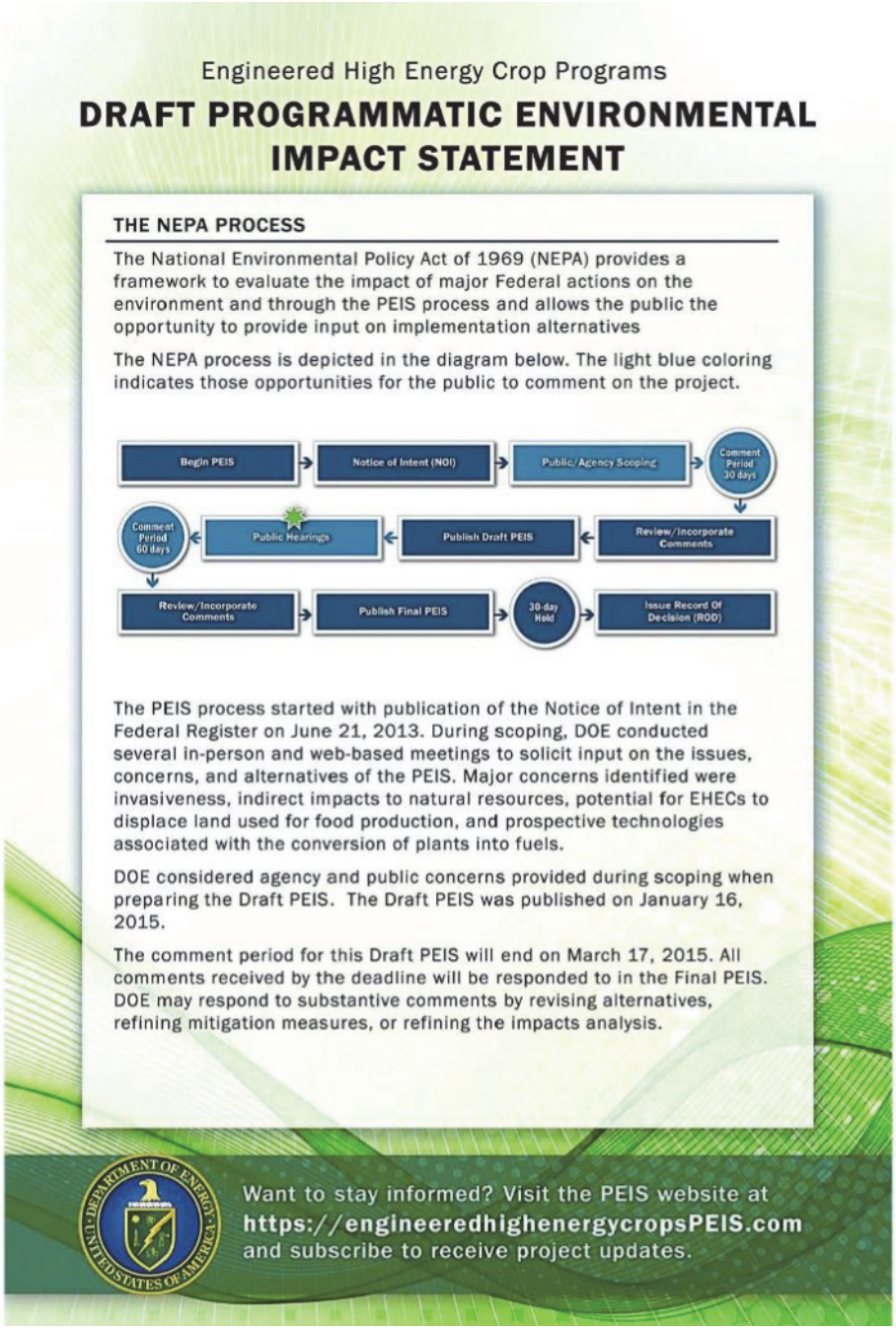
EHECs are:

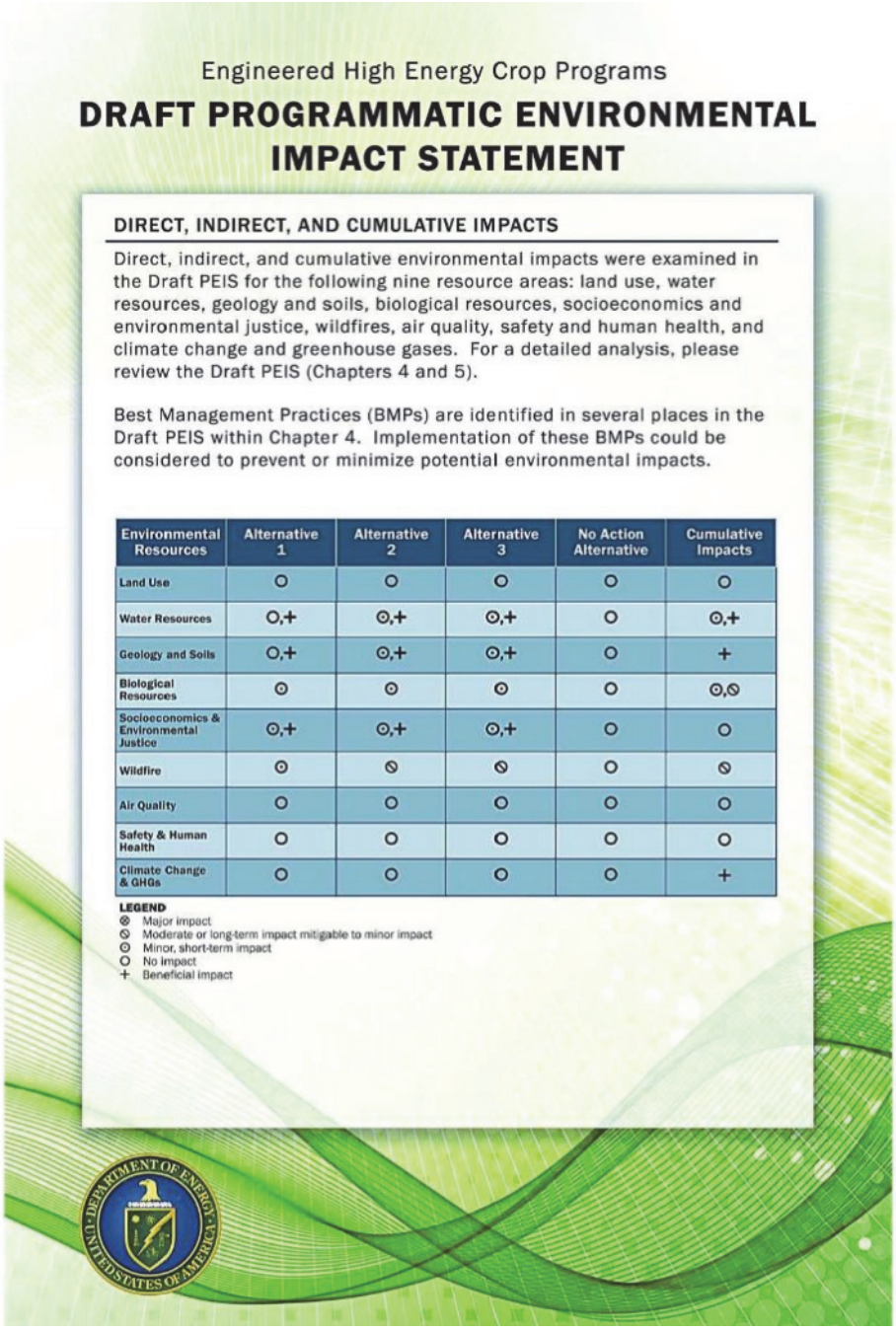
- Agriculturally-viable photosynthetic species that contain genetic material that has been intentionally introduced through biotechnology, interspecific hybridization or other engineering processes (excluding processes that occur in nature without human intervention); and
- Intended to produce more energy per acre by producing fuel molecules that can easily be introduced into existing energy infrastructure.

The representative graphic below shows how engineered biofuel crops are converted into usable biofuels for transportation (using corn as an example biofuel crop).

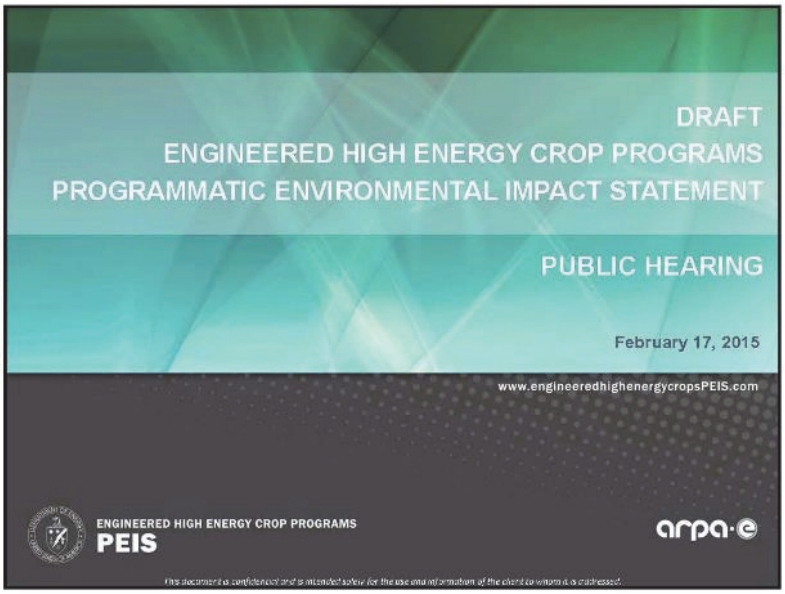


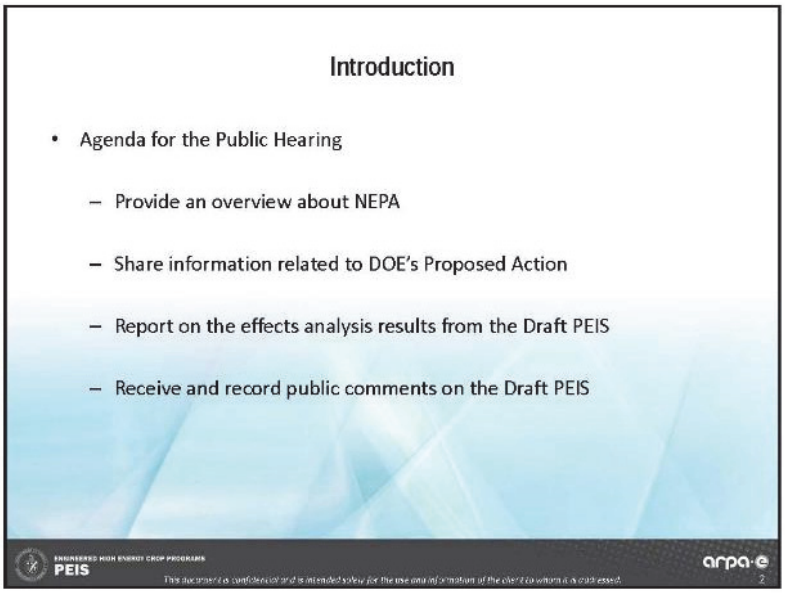

Engineered High Energy Crop Programs
DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT
GEOGRAPHIC SCOPE
DOE has chosen the southeastern United States as this geographic area provides favorable conditions for the growth of EHECs with short, mild winters and growing seasons of at least six months before the first frost.
8.3 SOUTHEASTERN USA PLAINS
8.4 OZARK/OUACHITA-APPALACHIAN FORESTS
8.5 MISSISSIPPI ALLUVIAL AND SOUTHEAST USA COASTAL PLAINS
The U.S. Environmental Protection Agency (EPA) derived Level II ecoregions were applied in the Draft PEIS to describe the existing environment. EPA's Level II ecoregions are determined based on the presence or absence of common flora, fauna, and non-living ecosystems characteristics.

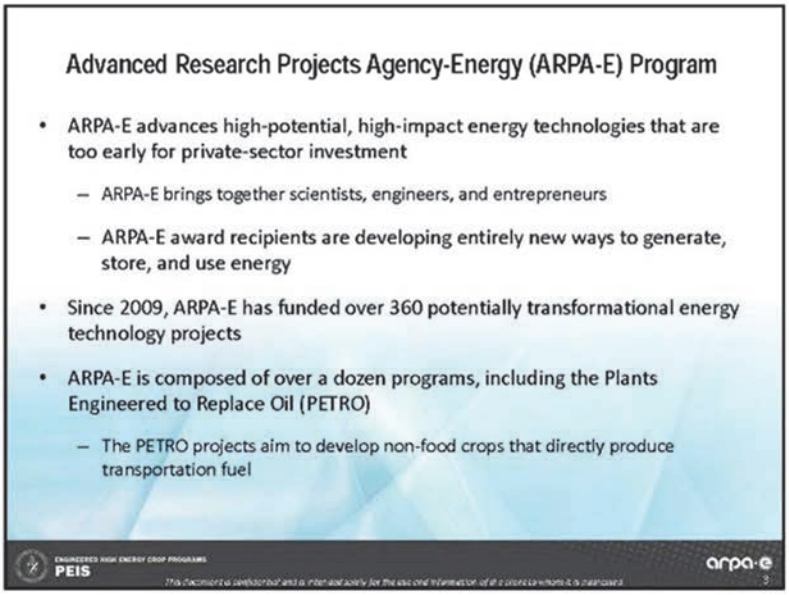

Engineered High Energy Crop Programs
DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT
THE NEPA PROCESS
The National Environmental Policy Act of 1969 (NEPA) provides a framework to evaluate the impact of major Federal actions on the environment and through the PEIS process and allows the public the opportunity to provide input on implementation alternatives
The NEPA process is depicted in the diagram below. The light blue coloring indicates those opportunities for the public to comment on the project.
Begin PEIS
Notice of Intent (NOI)
Public/Agency Scoping
Comment Period 30 days
Review/Incorporate Comments
Publish Draft PEIS
Public Hearings
Comment Period 60 days
Review/Incorporate Comments
Publish Final PEIS
30-day Hold
Issue Record Of Decision (ROD)
The PEIS process started with publication of the Notice of Intent in the Federal Register on June 21, 2013. During scoping, DOE conducted several in-person and web-based meetings to solicit input on the issues, concerns, and alternatives of the PEIS. Major concerns identified were invasiveness, indirect impacts to natural resources, potential for EHECs to displace land used for food production, and prospective technologies associated with the conversion of plants into fuels.
DOE considered agency and public concerns provided during scoping when preparing the Draft PEIS. The Draft PEIS was published on January 16, 2015.
The comment period for this Draft PEIS will end on March 17, 2015. All comments received by the deadline will be responded to in the Final PEIS. DOE may respond to substantive comments by revising alternatives, refining mitigation measures, or refining the impacts analysis.
Want to stay informed? Visit the PEIS website at
https://engineeredhighenergycropsPEIS.com
and subscribe to receive project updates.

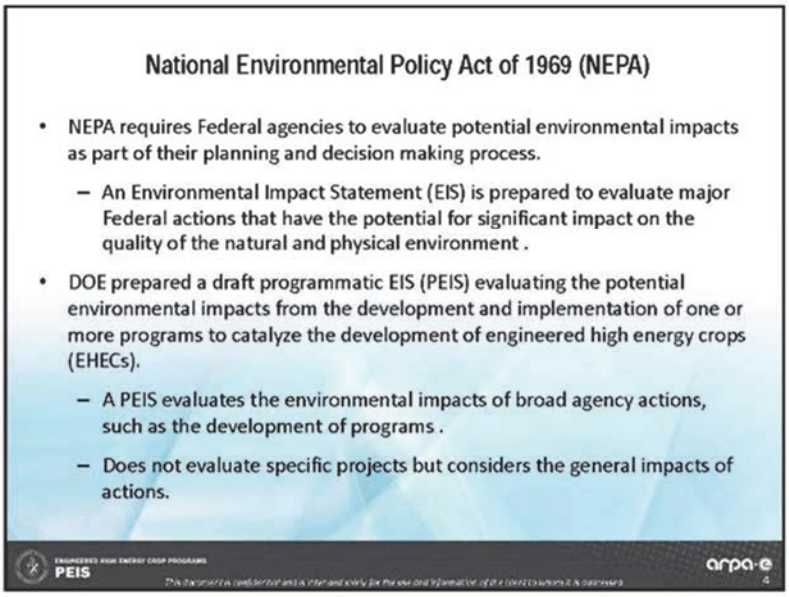


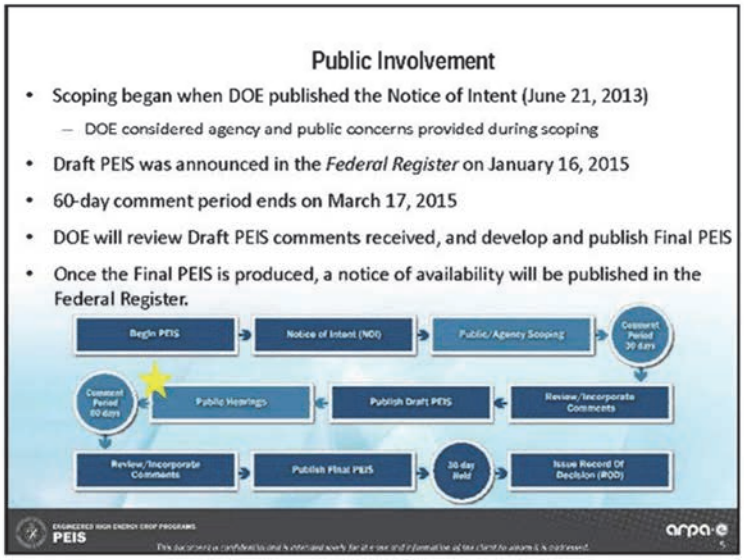
Environmental Resources	Alternative 1	Alternative 2	Alternative 3	No Action Alternative	Cumulative Impacts
Land Use	O	O	O	O	O
Water Resources	O,+	⊙,+	⊙,+	O	⊙,+
Geology and Soils	O,+	⊙,+	⊙,+	O	+
Biological Resources	⊙	⊙	⊙	O	⊙,⊘
Socioeconomics & Environmental Justice	⊙,+	⊙,+	⊙,+	O	O
Wildfire	⊙	⊘	⊘	O	⊘
Air Quality	O	O	O	O	O
Safety & Human Health	O	O	O	O	O
Climate Change & GHGs	O	O	O	O	+

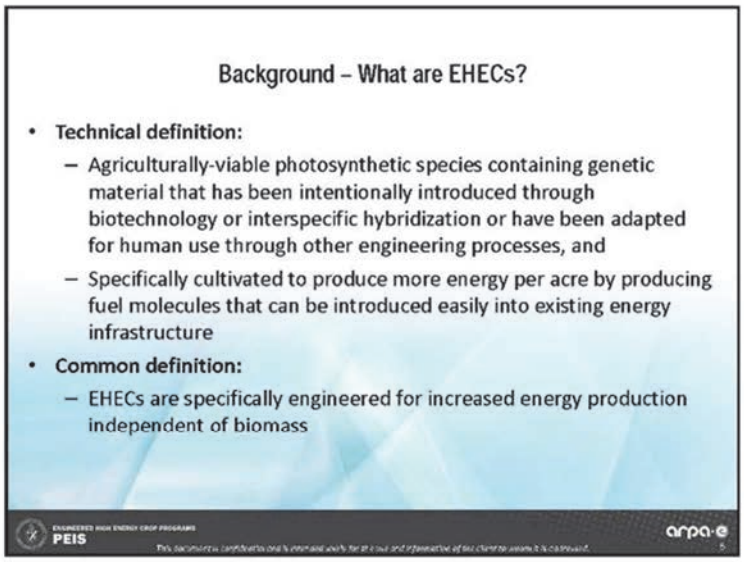

DRAFT
ENGINEERED HIGH ENERGY CROP PROGRAMS
PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT
PUBLIC HEARING
February 17, 2015
www.engineeredhighenergycropsPEIS.com
ENGINEERED HIGH ENERGY CROP PROGRAMS
PEIS
arpa·e

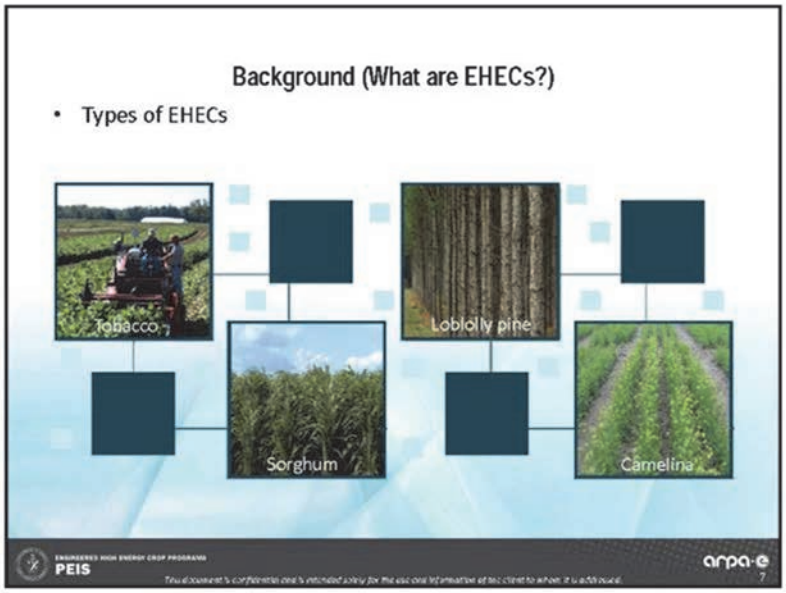

Introduction
• Agenda for the Public Hearing
– Provide an overview about NEPA
– Share information related to DOE's Proposed Action
– Report on the effects analysis results from the Draft PEIS
– Receive and record public comments on the Draft PEIS
PEIS
arpa·e

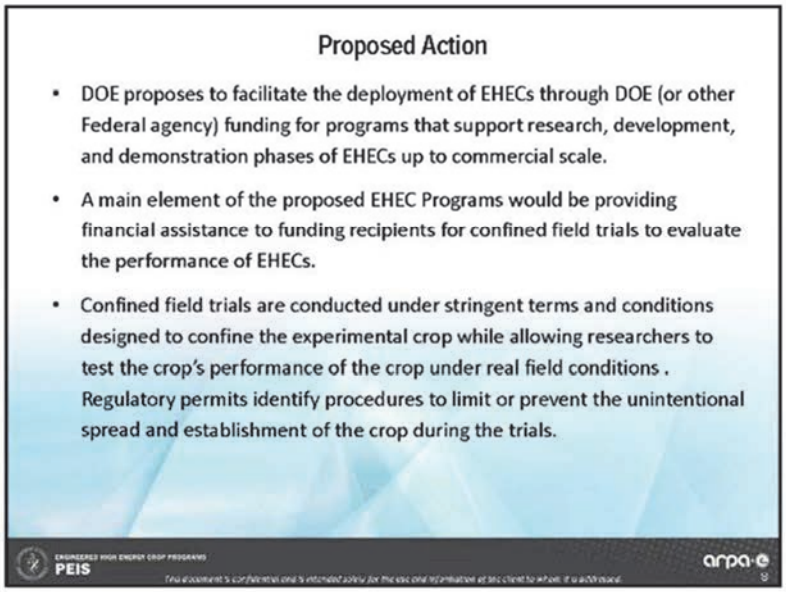

Advanced Research Projects Agency-Energy (ARPA-E) Program
• ARPA-E advances high-potential, high-impact energy technologies that are too early for private-sector investment
– ARPA-E brings together scientists, engineers, and entrepreneurs
– ARPA-E award recipients are developing entirely new ways to generate, store, and use energy
• Since 2009, ARPA-E has funded over 360 potentially transformational energy technology projects
• ARPA-E is composed of over a dozen programs, including the Plants Engineered to Replace Oil (PETRO)
– The PETRO projects aim to develop non-food crops that directly produce transportation fuel
PEIS
arpa·e


National Environmental Policy Act of 1969 (NEPA)
• NEPA requires Federal agencies to evaluate potential environmental impacts as part of their planning and decision making process.
– An Environmental Impact Statement (EIS) is prepared to evaluate major Federal actions that have the potential for significant impact on the quality of the natural and physical environment .
• DOE prepared a draft programmatic EIS (PEIS) evaluating the potential environmental impacts from the development and implementation of one or more programs to catalyze the development of engineered high energy crops (EHECs).
– A PEIS evaluates the environmental impacts of broad agency actions, such as the development of programs .
– Does not evaluate specific projects but considers the general impacts of actions.
PEIS
arpa·e


Public Involvement
• Scoping began when DOE published the Notice of Intent (June 21, 2013)
– DOE considered agency and public concerns provided during scoping
• Draft PEIS was announced in the Federal Register on January 16, 2015
• 60-day comment period ends on March 17, 2015
• DOE will review Draft PEIS comments received, and develop and publish Final PEIS
• Once the Final PEIS is produced, a notice of availability will be published in the Federal Register.
Begin PEIS
Notice of Intent (NOI)
Public/Agency Scoping
Comment Period 30 days
Review/Incorporate Comments
Publish Draft PEIS
Public Hearings
Comment Period 60 days
Review/Incorporate Comments
Publish Final PEIS
30 day Hold
Issue Record Of Decision (ROD)
PEIS
arpa·e


Background – What are EHECs?
• Technical definition:
– Agriculturally-viable photosynthetic species containing genetic material that has been intentionally introduced through biotechnology or interspecific hybridization or have been adapted for human use through other engineering processes, and
– Specifically cultivated to produce more energy per acre by producing fuel molecules that can be introduced easily into existing energy infrastructure
• Common definition:
– EHECs are specifically engineered for increased energy production independent of biomass
PEIS
arpa·e


Background (What are EHECs?)
• Types of EHECs
Tobacco
Loblolly pine
Sorghum
Camelina
PEIS
arpa·e

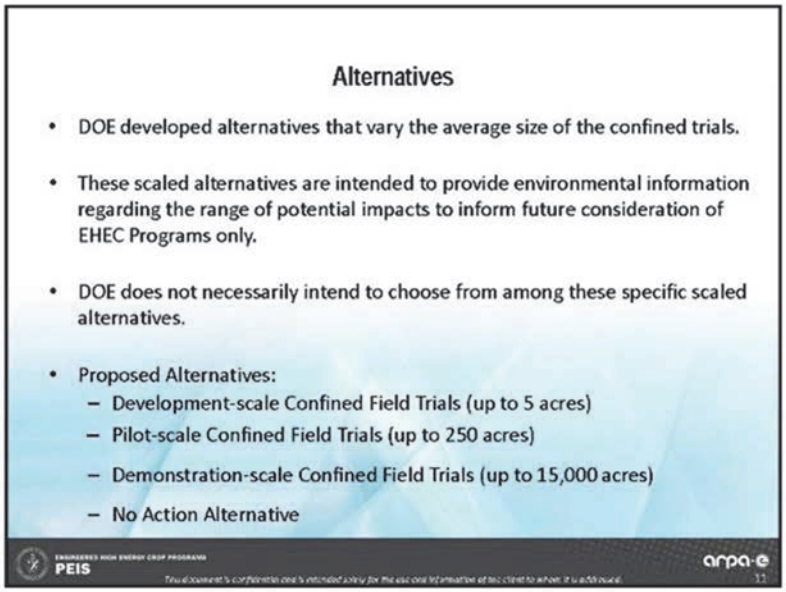

Proposed Action
• DOE proposes to facilitate the deployment of EHECs through DOE (or other Federal agency) funding for programs that support research, development, and demonstration phases of EHECs up to commercial scale.
• A main element of the proposed EHEC Programs would be providing financial assistance to funding recipients for confined field trials to evaluate the performance of EHECs.
• Confined field trials are conducted under stringent terms and conditions designed to confine the experimental crop while allowing researchers to test the crop's performance of the crop under real field conditions . Regulatory permits identify procedures to limit or prevent the unintentional spread and establishment of the crop during the trials.
PEIS
arpa·e

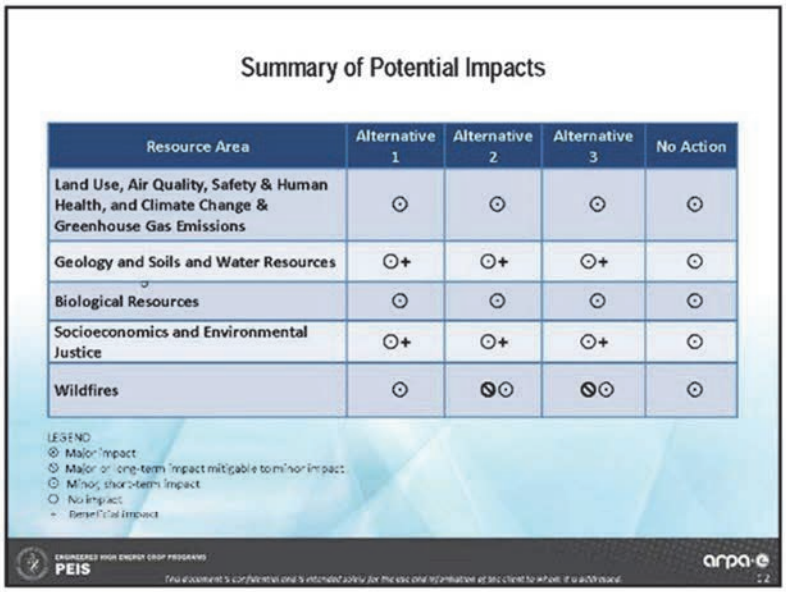
Purpose and Need

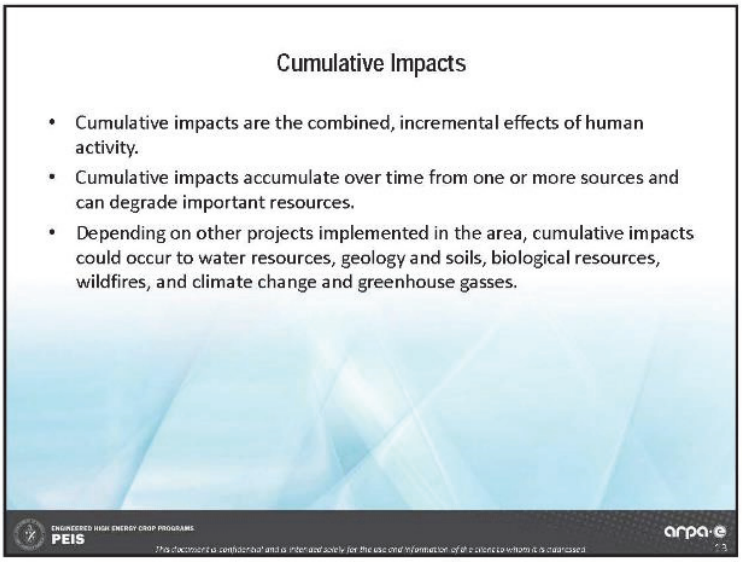
- The purpose and need for this Proposed Action is to facilitate the deployment of EHECs through funding programs that support research, development, and demonstration of EHECs up to commercial scale.
- In the absence of DOE funding and support for EHEC programs, scientific understanding and innovation in the responsible use of EHECs and, ultimately, commercial deployment of EHECs would develop more slowly or not at all.
- Accordingly, DOE needs to take action to catalyze programs for the development and deployment of EHECs.

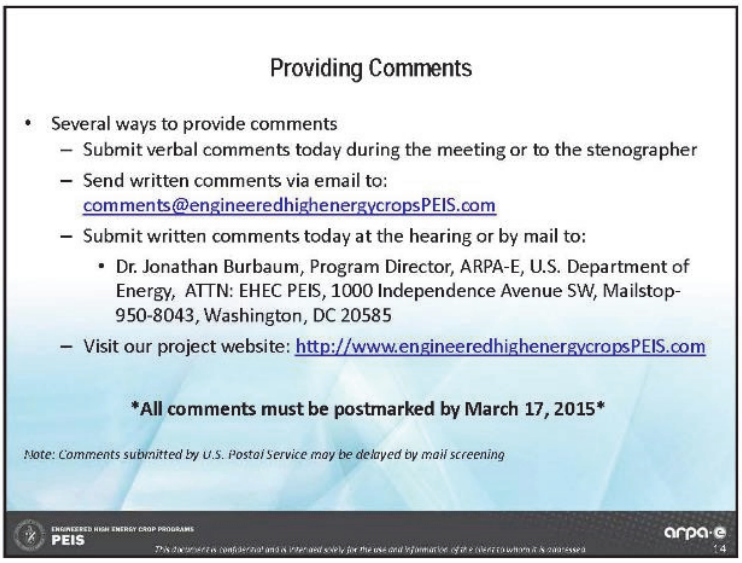
Geographic Scope

- Southeastern United States to include: Alabama, Florida (excluding the Everglades/Southern Florida coastal plain ecoregion), Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia
  - Ideal climate and agricultural conditions to cultivate EHECs
- DOE used the EPA's Level II ecoregions to assess common and different potential impacts of the Proposed Action.


Alternatives
• DOE developed alternatives that vary the average size of the confined trials.
• These scaled alternatives are intended to provide environmental information regarding the range of potential impacts to inform future consideration of EHEC Programs only.
• DOE does not necessarily intend to choose from among these specific scaled alternatives.
• Proposed Alternatives:
– Development-scale Confined Field Trials (up to 5 acres)
– Pilot-scale Confined Field Trials (up to 250 acres)
– Demonstration-scale Confined Field Trials (up to 15,000 acres)
– No Action Alternative
PEIS
arpa·e


Summary of Potential Impacts
Resource Area
Alternative 1
Alternative 2
Alternative 3
No Action
Land Use, Air Quality, Safety & Human Health, and Climate Change & Greenhouse Gas Emissions
Geology and Soils and Water Resources
Biological Resources
Socioeconomics and Environmental Justice
Wildfires
LEGEND
Major Impact
Major or long-term impact mitigable to minor impact
Minor, short-term impact
No Impact
Beneficial Impact
PEIS
arpa·e


Cumulative Impacts
• Cumulative impacts are the combined, incremental effects of human activity.
• Cumulative impacts accumulate over time from one or more sources and can degrade important resources.
• Depending on other projects implemented in the area, cumulative impacts could occur to water resources, geology and soils, biological resources, wildfires, and climate change and greenhouse gasses.
ENGINEERED HIGH ENERGY CROP PROGRAMS
PEIS
arpa·e
13


Providing Comments
• Several ways to provide comments
– Submit verbal comments today during the meeting or to the stenographer
– Send written comments via email to: comments@engineeredhighenergycropsPEIS.com
– Submit written comments today at the hearing or by mail to:
• Dr. Jonathan Burbaum, Program Director, ARPA-E, U.S. Department of Energy, ATTN: EHEC PEIS, 1000 Independence Avenue SW, Mailstop-950-8043, Washington, DC 20585
– Visit our project website: http://www.engineeredhighenergycropsPEIS.com
All comments must be postmarked by March 17, 2015
Note: Comments submitted by U.S. Postal Service may be delayed by mail screening
ENGINEERED HIGH ENERGY CROP PROGRAMS
PEIS
arpa·e
14

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix D: Federal Agencies Invited as Cooperating Agencies

- Bureau of Land Management
- Department of Health and Human Services
- Department of the Interior
- Department of Transportation
- Environmental Protection Agency
- Federal Energy Regulatory Commission
- Food and Drug Administration
- Forest Service (Informally Accepted)
- National Institutes of Health
- Pipeline and Hazardous Materials Safety Administration
- U.S. Air Force
- U.S. Army
- U.S. Department of Agriculture, Animal and Plant Health Inspection Service (Accepted)
- U.S. Navy

THIS PAGE INTENTIONALLY LEFT BLANK.

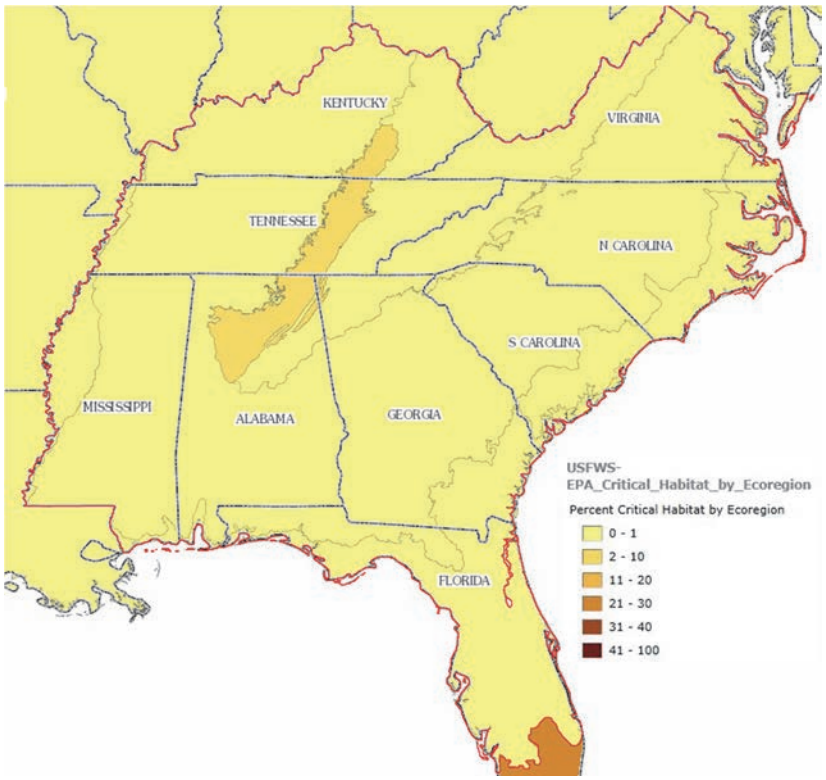
Appendix E: Federally-listed Threatened and Endangered Species and Critical Habitat

As described in Section 3.4, Biological Resources, under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range, whereas "threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except non-native pests, are eligible for listing as listed species. The ESA defines critical habitat as a habitat area essential to the conservation of a listed species, though the area need not actually be occupied by the species at the time it is designated.

The ESA also requires the designation of "critical habitat" for listed species and Federal agencies are required to avoid destruction or adverse modification of designated critical habitat. A critical habitat designation does not necessarily restrict further development but is a reminder to Federal agencies that they must make special efforts to protect the important characteristics of these areas. Only activities that involve a Federal permit, license, or funding, and are likely to destroy or adversely modify the area of critical habitat will be affected. If critical habitat might be affected, the USFWS and the Federal agency and, where appropriate, private or other landowners to work together to amend their Proposed Action so that it will not adversely affect the critical habitat. Figure E-1 provides a general illustration of the percentage[23] of designated critical habitat for each state by ecoregion.

[23] The USGS ScienceBase Catalog states that the "Critical Habitat by Ecoregion map was derived by calculating the percentage of each Ecoregion that is occupied by pixels representing Critical Habitat (of any species)."

Figure E-1: Percent of Designated Critical Habitat in the Project Area



Source: (U.S. Geological Survey, 2014b)

Table E-1 lists protected species identified for the states in the project area and attempts to identify possible species distribution based on the state and corresponding Level II ecoregions. Note that listed aquatic species, such as clams, corals, fishes, and sea turtles, are included but these species would not be found in-land at agricultural areas within the project area; however, runoff concerns into neighboring waterways would need to be considered.

Table E-1: Vertebrate and Invertebrate Species Listed under the ESA

Key: E = Endangered; T = Threatened

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Species Group: Amphibians						
Frog, dusky gopher	*Rana sevosa*	U.S.A. (AL, FL, MS)	Entire range	8.3, 8.5	E	Y
Salamander, frosted flatwoods	*Ambystoma cingulatum*	U.S.A. (AL, FL, GA, SC)	Entire range	8.3, 8.5	T	Y
Salamander, Red Hills	*Phaeognathus hubrichti*	U.S.A. (AL)	Entire range	8.3, 8.5	T	N
Salamander, Reticulated flatwoods	*Ambystoma bishopi*		Entire range	8.3, 8.5	E	Y
Salamander, Shenandoah	*Plethodon shenandoah*	U.S.A. (VA)	Entire range	8.4	E	N
Species Group: Arachnids						
Spider, spruce-fir moss	*Microhexura montivaga*	U.S.A. (NC, TN)	Entire range	8.4	E	Y
Species Group: Birds						
Caracara, Audubon's crested	*Polyborus plancus audubonii*	U.S.A. (FL)	U.S.A. (FL)	8.5	T	N
Plover, piping	*Charadrius melodus*	U.S.A. (Atlantic and Gulf coasts)	Entire range	8.5	T	Y
Scrub-jay, Florida	*Aphelocoma coerulescens*	U.S.A. (FL)	Entire range	8.3, 8.5	T	N
Sparrow, Florida grasshopper	*Ammodramus savannarum floridanus*	U.S.A. (FL)	Entire range	8.3, 8.5	E	N
Stork, wood	*Mycteria americana*	U.S.A. (TX to Carolinas)	U.S.A. (AL, FL, GA, SC)	8.3, 8.5	E	N
Tern, least	*Sterna antillarum*	U.S.A. (Atlantic and Gulf coasts, Mississippi River Basin)	U.S.A. (LA (Miss. River and tribs. N of Baton Rouge), MS (Mississippi River)	8.5	E	N
Tern, roseate	*Sterna dougallii dougallii*	Tropical and temperate coasts of Atlantic Basin	U.S.A. (Atlantic Coast south to NC)	8.5	E	N

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Tern, roseate	*Sterna dougallii dougallii*	Tropical and temperate coasts of Atlantic Basin	Western Hemisphere and adjacent oceans, incl. U.S.A. (FL), where not listed as endangered	8.5	T	N
Warbler (=wood), Bachman's	*Vermivora bachmanii*	U.S.A. (Southeastern)	Entire range	8.3, 8.5	E	N
Woodpecker, red-cockaded	*Picoides borealis*	U.S.A. (Southcentral, Southeastern)	Entire range	8.3, 8.5	E	N
Species Group: Fishes						
Sturgeon, shortnose	*Acipenser brevirostrum*	U.S.A. (FL, GA, NC, SC, VA)	Entire range		E	N
Sturgeon (Gulf subspecies), Atlantic	*Acipenser oxyrinchus (=oxyrhynchus) desotoi*	U.S.A. (AL, FL, GA)	Entire range		T	Y
Sturgeon, Atlantic	*Acipenser oxyrinchus oxyrinchus*	U.S.A. (NC)	Carolina DPS - See 50 CFR 224.101		E	N
Dace, Laurel	*Chrosomus saylori*	U.S.A. (TN)	Entire range		E	Y
Sculpin, pygmy	*Cottus paulus (=pygmaeus)*	U.S.A. (AL)	Entire range		T	N
Shiner, blue	*Cyprinella caerulea*	U.S.A. (TN, GA, AL)	Entire range		T	N
Sunfish, spring pygmy	*Elassoma alabamae*	U.S.A. (AL)	Entire range		T	N
Chub, spotfin	*Erimonax monachus*	U.S.A. (VA, TN, NC, GA, AL)	Entire range		T	Y
Chub, slender	*Erimystax cahni*	U.S.A. (VA, TN)	Entire range		T	Y
Darter, slackwater	*Etheostoma boschungi*	U.S.A. (TN, AL)	Entire range		T	Y
Darter, vermilion	*Etheostoma chermocki*	U.S.A. (AL)	Entire range		E	Y
Darter, relict	*Etheostoma chienense*	U.S.A. (KY)	Entire range		E	Y

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Darter, Etowah	*Etheostoma etowahae*	U.S.A. (GA)	Entire range		E	Y
Darter, watercress	*Etheostoma nuchale*	U.S.A. (AL)	Entire range		E	Y
Darter, Okaloosa	*Etheostoma okaloosae*	U.S.A. (FL)	Entire range		T	Y
Darter, duskytail	*Etheostoma percnurum*	U.S.A. (VA, TN, KY)	Entire range		E	Y
Darter, rush	*Etheostoma phytophilum*	U.S.A. (AL)	Entire range		E	Y
Darter, Cherokee	*Etheostoma scotti*	U.S.A. (GA)	Entire range		E	Y
Darker, bluemask (=jewel)	*Etheostoma sp.*	U.S.A. (TN)	Entire range		E	Y
Darter, Cumberland	*Etheostoma susanae*	U.S.A. (TN, KY)	Entire range		E	Y
Darter, boulder	*Etheostoma wapiti*	U.S.A. (TN, AL)	Entire range		E	Y
Silverside, Waccamaw	*Menidia extensa*	U.S.A. (NC)	Entire range		T	Y
Shiner, palezone	*Notropis albizonatus*	U.S.A. (TN, KY, AL)	Entire range		E	Y
Shiner, Cahaba	*Notropis cahabae*	U.S.A. (AL)	Entire range		E	Y
Shine, Cape Fear	*Notropis mekistocholas*	U.S.A. (NC)	Entire range		E	Y
Madtom, smoky	*Noturus baileyi*	U.S.A. (TN)	Entire range		E	Y
Madtom, chucky	*Noturus crypticus*	U.S.A. (TN)	Entire range		E	Y
Madtom, yellowfin	*Noturus flavipinnis*	U.S.A. (VA, TN)	Entire range, except where listed as an experimental population		T	Y
Madtom, pygmy	*Noturus stanauli*	U.S.A. (TN)	Entire range		E	Y
Darter, amber	*Percina antesella*	U.S.A. (TN, GA, AL)	Entire range		E	Y
Darter, goldline	*Percina aurolineata*	U.S.A. (TN, GA, AL)	Entire range		T	Y
Logperch, Conasauga	*Percina jenkinsi*	U.S.A. (TN, GA)	Entire range		E	Y

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Logperch, Roanoke	*Percina rex*	U.S.A. (VA, NC)	Entire range		E	Y
Dace, blackside	*Phoxinus cumberlandensis*	U.S.A. (TN, KY, VA)	Entire range		T	Y
Sawfish, smalltooth	*Pristis pectinata*	U.S.A. (AL, FL, GA, NC)	United States DPS - See 50 CFR224.101		E	Y
Cavefish, Alabama	*Speoplatyrhinus poulsoni*	U.S.A. (AL)	Entire range		E	Y
Species Group: Insects						
Beetle, American burying	*Nicrophorus americanus*	U.S.A. (Eastern states south to FL)	Entire range	8.3, 8.4, 8.5	E	N
Beetle, northeastern beach tiger	*Cicindela dorsalis dorsalis*	U.S.A. (VA)	Entire range	8.3, 8.4, 8.5	T	N
Butterfly, Bartram's hairstreak	*Strymon acis bartrami*	U.S.A. (FL)	Entire range	8.3, 8.5	E	Y
Butterfly, Florida leafwing	*Anaea troglodyte floridalis*	U.S.A. (FL)	Entire range	8.3, 8.5	E	Y
Butterfly, Miami Blue	*Cyclargus (=Hemiargus) thomasi bethunebakeri*	U.S.A. (FL)	Entire range	8.3, 8.5	E	N
Butterfly, Saint Francis' satyr	*Neonympha mitchellii francisci*	U.S.A. (NC)	Entire range	8.3, 8.4, 8.5	E	N
Species Group: Invertebrates						
Acornshell, southern	*Epioblasma othcaloogensis*	U.S.A. (TN, GA, AL)	Entire range	8.3, 8.4	E	Y
Bankclimber, purple (mussel)	*Elliptoideus sloatianus*	U.S.A. (GA, FL, AL)	Entire range	8.3, 8.4, 8.5	T	Y
Bean, Choctaw	*Villosa choctawensis*	U.S.A. (FL, AL)	Entire range	8.3, 8.4, 8.5	E	Y
Bean, Cumberland (pearlymussel)	*Villosa trabalis*	U.S.A. (VA, TN, KY, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4, 8.5	E	N
Bean, purple	*Villosa perpurpurea*	U.S.A. (VA, TN)	Entire range	8.3, 8.4, 8.5	E	Y

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Bean, rayed	*Villosa fabalis*	U.S.A. (VA, TN, KY)	Entire range	8.3, 8.4, 8.5	E	N
Blossom, green (pearlymussel)	*Epioblasma torulosa gubernaculum*	U.S.A. (VA, TN)	Entire range	8.3, 8.4, 8.5	E	N
Blossom, tubercled (pearlymussel)	*Epioblasma torulosa torulosa*	U.S.A. (TN, KY, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4	E	N
Blossom, turgid (pearlymussel)	*Epioblasma turgidula*	U.S.A. (AL, TN)	Entire range, except where listed as Experimental Populations	8.3, 8.4	E	N
Blossom, yellow (pearlymussel)	*Epioblasma florentina florentina*	U.S.A. (AL, TN)	Entire range, except where listed as Experimental Populations	8.3, 8.4	E	N
Campeloma, slender	*Campeloma decampi*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Clubshell	*Pleurobema clava*	U.S.A. (KY, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4	E	N
Clubshell, black	*Pleurobema curtum*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Clubshell, ovate	*Pleurobema perovatum*	U.S.A. (TN, MS, GA, AL)	Entire range	8.3, 8.4	E	Y
Clubshell, southern	*Pleurobema decisum*	U.S.A. (TN, MS, GA, AL)	Entire range	8.3, 8.4	E	Y
Combshell, Cumberlandian	*Epioblasma brevidens*	U.S.A. (VA, TN, MS, KY, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4, 8.5	E	Y
Combshell, southern	*Epioblasma penita*	U.S.A. (MS, AL)	Entire range	8.3, 8.4	E	N
Combshell, upland	*Epioblasma metastriata*	U.S.A. (TN, GA, AL)	Entire range	8.3, 8.4	E	Y
Coral, elkhorn	*Acropora palmata*	U.S.A. (FL)	Entire range	8.3, 8.5	T	Y
Crayfish, Nashville	*Orconectes shoupi*	U.S.A. (TN)	Entire range	8.3, 8.4	E	N

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Ebonyshell, round	*Fusconaia rotulata*	U.S.A. (FL, AL)	Entire range	8.3, 8.4, 8.5	E	Y
Elktoe, Appalachian	*Alasmidonta raveneliana*	U.S.A. (TN, NC)	Entire range	8.3, 8.4, 8.5	E	Y
Elktoe, Cumberland	*Alasmidonta atropurpurea*	U.S.A. (TN, KY)	Entire range	8.3, 8.4	E	Y
Fanshell	*Cyprogenia stegaria*	U.S.A. (VA, TN, KY, AL)	Entire range	8.3, 8.4, 8.5	E	N
Globe, noonday	*Patera clarki nantahala*	U.S.A. (NC)	Entire range	8.3, 8.4, 8.5	T	N
Heelsplitter, Alabama (=inflated)	*Potamilus inflatus*	U.S.A. (MS, AL)	Entire range	8.3, 8.4	T	N
Heelsplitter, Carolina	*Lasmigona decorata*	U.S.A. (SC, NC)	Entire range	8.3, 8.4, 8.5	E	Y
Isopod, Lee County cave	*Lirceus usdagalun*	U.S.A. (VA)	Entire range	8.3, 8.4, 8.5	E	N
Isopod, Madison Cave	*Antrolana lira*	U.S.A. (VA)	Entire range	8.3, 8.4, 8.5	T	N
Kidneyshell, fluted	*Ptychobranchus subtentum*	U.S.A. (VA, TN, KY)	Entire range	8.3, 8.4, 8.5	E	Y
Kidneyshell, southern	*Ptychobranchus jonesi*	U.S.A. (FL, AL)	Entire range	8.3, 8.4, 8.5	E	Y
Kidneyshell, triangular	*Ptychobranchus greenii*	U.S.A. (TN, GA, AL)	Entire range	8.3, 8.4	E	Y
Lampmussel, Alabama	*Lampsilis virescens*	U.S.A. (TN, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4	E	N
Lilliput, pale (pearlymussel)	*Toxolasma cylindrellus*	U.S.A. (TN, AL)	Entire range	8.3, 8.4	E	N
Moccasinshell, Alabama	*Medionidus acutissimus*	U.S.A. (MS, GA, AL)	Entire range	8.3, 8.4	T	Y
Moccasinshell, Coosa	*Medionidus parvulus*	U.S.A. (TN, GA, AL)	Entire range	8.3, 8.4	E	Y
Moccasinshell, Gulf	*Medionidus penicillatus*	U.S.A. (GA, FL, AL)	Entire range	8.3, 8.4, 8.5	E	Y
Moccasinshell, Ochlockonee	*Medionidus simpsonianus*	U.S.A. (GA, FL)	Entire range	8.3, 8.5	E	Y
Monkeyface, Appalachian (pearlymussel)	*Quadrula sparsa*	U.S.A. (VA, TN)	Entire range	8.3, 8.4, 8.5	E	N

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Monkeyface, Cumberland (pearlymussel)	*Quadrula intermedia*	U.S.A. (VA, TN, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4, 8.5	E	N
Mucket, orangenacre	*Lampsilis perovalis*	U.S.A. (MS, AL)	Entire range	8.3, 8.4	T	Y
Mucket, pink (pearlymussel)	*Lampsilis abrupta*	U.S.A. (VA, TN, KY, AL)	Entire range	8.3, 8.4, 8.5	E	N
Mussel, oyster	*Epioblasma capsaeformis*	U.S.A. (VA, TN, NC, KY, GA, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4, 8.5	E	Y
Mussel, sheepnose	*Plethobasus cyphyus*	U.S.A. (VA, TN, MS, KY,AL)	Entire range	8.3, 8.4, 8.5	E	N
Mussel, snuffbox	*Epioblasma triquetra*	U.S.A. (AL, KY, MS, VA)	Entire range	8.3, 8.4, 8.5	E	N
Pearlshell, Alabama	*Margaritifera marrianae*	U.S.A. (AL)	Entire range	8.3, 8.4	E	Y
Pearlymussel, birdwing	*Lemiox rimosus*	U.S.A. (VA, TN, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4, 8.5	E	N
Pearlymussel, cracking	*Hemistena lata*	U.S.A. (VA, TN, KY, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4, 8.5	E	N
Pearlymussel, dromedary	*Dromus dromas*	U.S.A. (VA, TN, KY, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4, 8.5	E	N
Pearlymussel, littlewing	*Pegias fabula*	U.S.A. (VA, TN, NC, KY, AL)	Entire range	8.3, 8.4, 8.5	E	N
Pearlymussel, slabside	*Pleuronaia dolabelloides*	U.S.A. (VA, TN, MS, KY, AL)	Entire range	8.3, 8.4, 8.5	E	Y
Pigtoe, Cumberland	*Pleurobema gibberum*	U.S.A. (TN)	Entire range	8.3, 8.4	E	N
Pigtoe, dark	*Pleurobema furvum*	U.S.A. (AL)	Entire range	8.3, 8.4	E	Y
Pigtoe, finerayed	*Fusconaia cuneolus*	U.S.A. (VA, TN, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4, 8.5	E	N

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Pigtoe, flat	*Pleurobema marshalli*	U.S.A. (MS, AL)	Entire range	8.3, 8.4	E	N
Pigtoe, fuzzy	*Pleurobema strodeanum*	U.S.A. (FL, AL)	Entire range	8.3, 8.5	T	Y
Pigtoe, Georgia	*Pleurobema hanleyianum*	U.S.A. (TN, GA, AL)	Entire range	8.3, 8.4	E	Y
Pigtoe, heavy	*Pleurobema taitianum*	U.S.A. (MS, AL)	Entire range	8.3, 8.4	E	N
Pigtoe, narrow	*Fusconaia escambia*	U.S.A. (FL, AL)	Entire range	8.3, 8.5	T	Y
Pigtoe, oval	*Pleurobema pyriforme*	U.S.A. (GA, FL, AL)	Entire range	8.3, 8.4	E	Y
Pigtoe, rough	*Pleurobema plenum*	U.S.A. (VA, TN, KY, AL)	Entire range	8.3, 8.4, 8.5	E	N
Pigtoe, shiny	*Fusconaia cor*	U.S.A. (VA, TN, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4, 8.5	E	N
Pigtoe, southern	*Pleurobema georgianum*	U.S.A. (TN, GA, AL)	Entire range	8.3, 8.4	E	Y
Pigtoe, tapered	*Fusconaia burkei*	U.S.A. (FL, AL)	Entire range	8.3, 8.5	T	Y
Pimpleback, orangefoot (pearlymussel)	*Plethobasus cooperianus*	U.S.A. (TN, KY, AL)	Entire range	8.3, 8.4, 8.5	E	N
Pocketbook, fat	*Potamilus capax*	U.S.A. (MS, KY, AR)	Entire range	8.3, 8.4	E	N
Pocketbook, finelined	*Lampsilis altilis*	U.S.A. (GA, AL)	Entire range	8.3, 8.4	T	Y
Pocketbook, shinyrayed	*Lampsilis subangulata*	U.S.A. (GA, FL, AL)	Entire range	8.3, 8.4, 8.5	E	Y
Purple Cat's paw (=Purple Cat's paw pearlymussel)	*Epioblasma obliquata obliquata*	U.S.A. (TN, KY, AL)	Entire range, except where listed as Experimental Populations	8.3, 8.4	E	N
Rabbitsfoot	*Quadrula cylindrica cylindrica*	U.S.A. (KY, MS, TN)	Entire range	8.3, 8.4	T	N
Rabbitsfoot, rough	*Quadrula cylindrica strigillata*	U.S.A. (VA, TN)	Entire range	8.3, 8.4, 8.5	E	Y

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Riffleshell, northern	*Epioblasma torulosa rangiana*	U.S.A. (KY)	Entire range	8.3, 8.4	E	N
Riffleshell, tan	*Epioblasma florentina walkeri (=E. walkeri)*	U.S.A. (VA, TN, NC, KY, AL)	Entire range	8.3, 8.4, 8.5	E	N
Ring pink (mussel)	*Obovaria retusa*	U.S.A. (TN, KY, AL)	Entire range	8.3, 8.4	E	N
sandshell, Southern	*Hamiota australis*	U.S.A. (FL, AL)	Entire range	8.3, 8.4, 8.5	T	Y
Shrimp, Alabama cave	*Palaemonias alabamae*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Shrimp, Kentucky cave	*Palaemonias ganteri*	U.S.A. (KY)	Entire range	8.3, 8.4	E	Y
Shrimp, Squirrel Chimney Cave	*Palaemonetes cummingi*	U.S.A. (FL)	Entire range	8.3, 8.5	T	N
Slabshell, Chipola	*Elliptio chipolaensis*	U.S.A. (FL, AL)	Entire range	8.3, 8.4, 8.5	T	Y
Spectaclecase (mussel)	*Cumberlandia monodonta*	U.S.A. (AL, KY, TN, VA)	Entire range	8.3, 8.4, 8.5	E	N
Spinymussel, Altamaha	*Elliptio spinosa*	U.S.A. (GA)	Entire range	8.3, 8.4, 8.5	E	Y
Spinymussel, James	*Pleurobema collina*	U.S.A. (VA)	Entire range	8.3, 8.4, 8.5	E	N
Spinymussel, Tar River	*Elliptio steinstansana*	U.S.A. (NC)	Entire range	8.3, 8.4, 8.5	E	N
Wartyback, white (pearlymussel)	*Plethobasus cicatricosus*	U.S.A. (TN, KY, AL)	Entire range	8.3, 8.4	E	N
Wedgemussel, dwarf	*Alasmidonta heterodon*	U.S.A. (VA, NC)	Entire range	8.3, 8.4, 8.5	E	N
Species Group: Mammals						
Bat, gray	*Myotis grisescens*	Central and Southeastern U.S.A.	Entire range	8.3, 8.4, 8.5	E	N
Bat, Indiana	*Myotis sodalis*		Entire range	8.3, 8.4, 8.5	E	Y
Bat, Virginia big-eared	*Corynorhinus (=Plecotus) townsendii virginianus*	U.S.A. (KY, NC, VA)	Entire range	8.3, 8.4, 8.5	E	Y

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Bear, Louisiana black	*Ursus americanus luteolus*	U.S.A. (MS - all counties south of or touching a line from Greenville, Washington County to Meridian, Lauderdale County)	Entire range	8.3, 8.5	T	Y
Mouse, Alabama beach	*Peromyscus polionotus ammobates*	U.S.A. (AL)	Entire range	8.3, 8.4	E	Y
Mouse, Anastasia Island beach	*Peromyscus polionotus phasma*	U.S.A. (FL)	Entire range	8.3, 8.5	E	N
Mouse, Choctawhatchee beach	*Peromyscus polionotus allophrys*	U.S.A. (FL)	Entire range	8.3, 8.5	E	Y
Mouse, Perdido Key beach	*Peromyscus polionotus trissyllepsis*	U.S.A. (AL, FL)	Entire range	8.3, 8.4, 8.5	E	Y
Mouse, southeastern beach	*Peromyscus polionotus niveiventris*	U.S.A. (FL)	U.S.A. (FL)	8.3, 8.5	T	N
Mouse, St. Andrew beach	*Peromyscus polionotus peninsularis*	U.S.A. (FL)	U.S.A. (FL)	8.3, 8.5	E	Y
Panther, Florida	*Puma (=Felis) concolor coryi*	U.S.A. (SC and FL)	U.S.A. (LA and AR east to SC and FL)	8.3, 8.4, 8.5	E	N
Puma (=cougar), eastern	*Puma (=Felis) concolor couguar*	Eastern North America	Eastern North America	8.3, 8.4, 8.5	E	N
Squirrel, Carolina northern flying	*Glaucomys sabrinus coloratus*	U.S.A. (NC, TN)	Entire range	8.3, 8.4, 8.5	E	N

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Vole, Florida salt marsh	*Microtus pennsylvanicus dukecampbelli*	U.S.A. (FL)	Entire range	8.3, 8.5	E	N
Wolf, red	*Canis rufus*	U.S.A. (Southeastern)	Entire range	8.3, 8.4, 8.5	E	N
Species Group: Reptiles						
Crocodile, American	*Crocodylus acutus*		Entire range, except FL	8.3, 8.5	E	N
Crocodile, American	*Crocodylus acutus*	U.S.A. (FL)	FL pop.	8.3, 8.5	T	N
Skink, bluetail mole	*Eumeces egregius lividus*	U.S.A. (FL)	Entire range	8.3, 8.5	T	N
Skink, sand	*Neoseps reynoldsi*	U.S.A. (FL)	Entire range	8.3, 8.5	T	N
Snake, Atlantic salt marsh	*Nerodia clarkii taeniata*	U.S.A. (FL)	Entire range	8.3, 8.5	T	N
Snake, eastern indigo	*Drymarchon corais couperi*	U.S.A. (AL, FL, GA, MS, SC)	Entire range	8.3, 8.4, 8.5	T	N
Tortoise, gopher	*Gopherus polyphemus*	U.S.A. (AL, FL, GA, MS, SC)	Wherever found west of Mobile & Tombigbee Rivers in AL and MS	8.3, 8.4, 8.5	T	N
Turtle, Alabama red-belly	*Pseudemys alabamensis*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Turtle, flattened musk	*Sternotherus depressus*	U.S.A. (AL)	Black Warrior River system upstream from Bankhead Dam	8.3, 8.4	T	N
Turtle, ringed map	*Graptemys oculifera*	U.S.A. (MS)	Entire range	8.3, 8.5	T	N
Species Group: Snails						
Campeloma, slender	*Campeloma decampi*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Elimia, lacy (snail)	*Elimia crenatella*	U.S.A. (AL)	Entire range	8.3, 8.4	T	N

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
globe, noonday	*Patera clarki nantahala*	U.S.A. (NC)	Entire range	8.3, 8.4, 8.5	T	N
Hornsnail, rough	*Pleurocera foremani*	U.S.A. (AL, GA)	Entire range	8.3, 8.4, 8.5	E	Y
Lioplax, cylindrical (snail)	*Lioplax cyclostomaformis*	U.S.A. (AL, GA)	Entire range	8.3, 8.4, 8.5	E	N
Marstonia, royal (snail)	*Pyrgulopsis ogmorhaphe*	U.S.A. (TN)	Entire range	8.3, 8.4	E	N
Pebblesnail, flat	*Lepyrium showalteri*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Riversnail, Anthony's	*Athearnia anthonyi*	U.S.A. (AL, GA, TN)	Entire range	8.3, 8.4, 8.5	E	N
Rocksnail, interrupted (=Georgia)	*Leptoxis foremani*	U.S.A. (GA, AL)	Entire range	8.3, 8.4, 8.5	E	Y
Rocksnail, painted	*Leptoxis taeniata*	U.S.A. (AL)	Entire range	8.3, 8.4	T	N
Rocksnail, plicate	*Leptoxis plicata*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Rocksnail, round	*Leptoxis ampla*	U.S.A. (AL)	Entire range	8.3, 8.4	T	N
Snail, armored	*Pyrgulopsis (=Marstonia) pachyta*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Snail, painted snake coiled forest	*Anguispira picta*	U.S.A. (TN)	Entire range	8.3, 8.4	T	N
Snail, tulotoma	*Tulotoma magnifica*	U.S.A. (AL)	Entire range	8.3, 8.4	T	N
Snail, Virginia fringed mountain	*Polygyriscus virginianus*	U.S.A. (VA)	Entire range	8.3, 8.4, 8.5	E	N
Snail, darter	*Percina tanasi*	U.S.A. (AL, GA, TN)	Entire range	8.3, 8.4, 8.5	T	
Elimia, lacy (snail)	*Elimia crenatella*	U.S.A. (AL)	Entire range	8.3, 8.4	T	N
Hornsnail, rough	*Pleurocera foremani*	U.S.A. (AL)	Entire range	8.3, 8.4	E	Y

Inverted Common Name	Scientific Name	Historic Range (Southeastern U.S. specific)	Where Listed (Southeastern U.S. specific)	Level II Ecoregion	Listing Status	Critical Habitat
Lioplax, cylindrical (snail)	*Lioplax cyclostomaformis*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Marstonia, royal (snail)	*Pyrgulopsis ogmorhaphe*	U.S.A. (TN)	Entire range	8.3, 8.4	E	N
Pebblesnail, flat	*Lepyrium showalteri*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Riversnail, Anthony's	*Athearnia anthonyi*	U.S.A. (TN, GA, AL)	Entire range	8.3, 8.4	E	N
Rocksnail, interrupted (=Georgia)	*Leptoxis foreman*	U.S.A. (GA, AL)	Entire Rang	8.3, 8.4	E	Y
Rocksnail, painted	*Leptoxis taeniata*	U.S.A. (AL)	Entire range	8.3, 8.4	T	N
Rocksnail, plicate	*Leptoxis plicata*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Rocksnail, round	*Leptoxis ampla*	U.S.A. (AL)	Entire range	8.3, 8.4	T	N
Snail, armored	*Pyrgulopsis (=Marstonia) pachyta*	U.S.A. (AL)	Entire range	8.3, 8.4	E	N
Snail, painted snake coiled forest	*Anguispira picta*	U.S.A. (TN)	Entire range	8.3, 8.4	T	N
Snail, Stock Island tree	*Orthalicus reses (not incl. nesodryas)*	U.S.A. (FL)	Entire range	8.3, 8.5	T	N
Snail, tulotoma	*Tulotoma magnifica*	U.S.A (AL)	Entire range	8.3, 8.4	T	N
Snail, Virginia fringed mountain	*Polygyriscus virginianus*	U.S.A. (VA)	Entire range	8.3, 8.4, 8.5	E	N

Source: (U.S. Fish & Wildlife Service, 2015)

THIS PAGE INTENTIONALLY LEFT BLANK

THIS PAGE INTENTIONALLY LEFT BLANK

THIS PAGE INTENTIONALLY LEFT BLANK

THIS PAGE INTENTIONALLY LEFT BLANK


DEPARTMENT OF ENERGY
UNITED STATES OF AMERICA