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Comments to USDA APHIS on Draft Environmental Assessment for “Controlled Release of a Genetically Engineered Eucalyptus Hybrid”

ArborGen LLC has filed two permit applications for the “controlled release” of genetically engineered (GE) eucalyptus at a total of twenty nine testing locations across seven southern U.S. states where it would be allowed to flower. USDA/APHIS has prepared a draft environmental assessment in response to permit applications (APHIS Number 08-011-106rm and 08-014-101rm) received from ArborGen to field test GE Eucalyptus trees, a clone coded EH1 derived from a hybrid of *Eucalyptus grandis* X *Eucalyptus urophylla*, genetically engineered with four different gene constructs, including cold tolerance. Pursuant to USDA’s June 3, 2009 Federal Register notice, the Center for Food Safety (CFS) and its sister non-profit the International Center for Technology Assessment (CTA) submit the following comments concerning the inadequacy of the agency’s National Environmental Policy Act (NEPA) draft Environmental Assessment (EA) associated with the planting of these transgenic trees.

CFS is a non-profit, membership organization that works to protect human health and the environment by curbing the proliferation of harmful food production technologies and by promoting organic and other forms of sustainable agriculture.¹ CFS seeks to prevent the approval, commercialization or release of any new genetically engineered crops until they have been thoroughly tested and found safe for human health and the environment. CFS maintains that any foods that already contain genetically engineered ingredients must be clearly labeled. CFS represents 76,000 members throughout the country.

¹ See generally <http://www.centerforfoodsafety.org>.

The International Center for Technology Assessment (CTA)² is committed to providing the public with full assessments and analyses of technological impacts on society and the environment. CTA is devoted to exploring the economic, ethical, social, environmental and political impacts that can result from the applications of technology or technological systems. Using this holistic form of analysis, CTA provides the public with independent, timely, and comprehensive information about the potential impacts of technology. Equally as important, CTA is the country's primary legal organization fighting megatechnologies and technocracies. Using legal petitions, comments, and litigation, CTA is at the forefront of the battles to limit genetic engineering, end the patenting of life, address greenhouse gas emissions, protect animals from abuse in research and agriculture, and halt deforestation.

SUMMARY

There are a number of serious inadequacies in APHIS's draft EA that necessitate the postponement of any decision on the future field testing of this GE Eucalyptus until and unless a comprehensive Environmental Impact Statement (EIS) has been prepared pursuant to the National Environmental Policy Act (NEPA) and until and unless APHIS has formally consulted sister wildlife agencies pursuant to the Endangered Species Act (ESA).

Based on the assessment of this draft EA, APHIS proposes to permit a total of 29 field tests spread across the southern United States. In a previous EA and FONSI APHIS permitted flowering on only 1.1 acres at one location, which was later expanded to 57 acres with 7.6 acres of flowering GE Eucalyptus. The permits are good for three years, but the plan is to renew the permits for the life of the trees, from seven to nine years. In total over 260,000 transgenic Eucalyptus trees will be planted and allowed to flower in seven different U.S. States, at locations classified as confidential but in an acknowledged wide variety of environments, locations that are near numerous federally protected lands. The trees are genetically engineered with four constructs, including constructs intended to confer cold tolerance and altered fertility. The experimental field tests are intended to tests these genes as well as utilize them, as altered fertility is relied on by APHIS as one of the means of attempting to confine the spread of the transgenic trees. The cold tolerant construct is intended to be controlled just enough to allow for growth in colder climates but not to increase invasiveness.

Although this is "only" a field test approval, at this scale the result can be fairly described as a *de facto* commercialization of mini-plantations, without bothering with deregulation and commercialization. Previously APHIS concluded that an EA was appropriate to assess the risks of 1.1 acres; instead of preparing a full EIS, now again APHIS concluded that an EA was appropriate, this time to assess the risks of -- 260,000 trees -- on 330 acres -- in seven different states -- at 29 different locations of up to 20 acres -- in a "wide variety of environments." (EA at 6). The sheer size and experimental nature of this proposal should require an EIS, yet APHIS has prepared only an EA.

² See generally <http://www.icta.org>

Faced with a myriad of reasonably foreseeable potential environmental impacts of the commercial plantation planting of these transgenic trees – biological contamination of natural ecosystems and protected places; establishment and invasiveness of a transgenic tree; public health and wildlife impacts; impacts on protected species; water and soil hydrology impacts; and fire impacts – APHIS divides and conquers them both spatially and temporally, claiming that each individual field test is too small to have risk or impacts on the surrounding environments. Yet NEPA requires a collective and cumulative assessment as well, an assessment that is not present in the draft EA. APHIS also relies heavily on the theoretically limited time and scope of these field trials: it is not a wholesale deregulation, yet, and any risks of further planting, no matter how foreseeable and interconnected, will be assessed separately. The defining thread of this draft EA is APHIS’ acknowledgment of numerous potential risks, but then unfortunate failure to adequately assess those risks, claiming they will be addressed at a later time, in a later document. Some risks are unfortunately and unlawfully shield from meaningful comment because APHIS has withheld crucial geographic and genetic data. Not only that, but the EA only looks at two alternatives – denying the permits or granting in full— even though there are an acknowledged wide variety of environments involved here which create different levels of risks. Finally, APHIS also relies on conclusory determinations of no risk in numerous contexts, without providing the data supporting the agency’s conclusion.

However these field trials are in every practical sense an extraordinarily dramatic, controversial, experimental and unprecedented increase in the amount, scope, and flowering of transgenic trees previously released into the environment. The risks are significant because, as the courts have ruled and we have seen in the GE crop context, biological contamination is irreparable and irreversible harm. This is a precedential trial, the first attempt to use engineered sterility as biocontainment at this scale. Here, at issue are risks of contamination to our forests and protected wild places. The introduced engineered trees, Eucalyptus, also bring with them a host of potential environmental impacts that have a history of causing severe fire, water, and biodiversity problems elsewhere, as well as being associated with a serious public health risk, a deadly fungal pathogen.

Moreover, ArborGen is quite clear that the purpose of this unprecedented field test release *is to then acquire deregulation* “for managed plantation forests in the southeastern U.S.” (EA at 6). ArborGen has had a deregulation petition pending for this same GE, cold tolerant Eucalyptus since December 2008.³ Yet despite this reasonably foreseeable outcome, APHIS declines to address these impacts. In light of this knowledge, APHIS’ procrastination in preparing a robust EIS is a dereliction of duty and a violation of NEPA’s command that agencies assess the reasonably foreseeable impacts of their actions at the earliest possible time. The EA is inadequate now, to say nothing of how inadequate it will be if and when the idea of deregulation is eventually broached. Instead of letting this massive experiment go forward based on very little data and without

³ 08-366-01p ArborGen, Reg Article: Eucalyptus, AP-Freeze tolerant, Received: 31-DEC-2008, Status: Pending, at http://www.aphis.usda.gov/brs/not_reg.html

adequately assessing the foreseeable risks involved, APHIS should at a minimum prepare an EIS.

COMMENTS

The following comments illustrate why the proposed flowering field trials should not be permitted until and unless APHIS prepares an environmental impacts statement (“EIS”) to fully review the significant environmental effects of this action.

The National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires a federal agency such as USDA APHIS to prepare a detailed EIS for all “major Federal actions significantly affecting the quality of the human environment.”⁴ NEPA “ensures that the agency ... will have available, and will carefully consider, detailed information concerning significant environmental impacts; it also guarantees that the relevant information will be made available to the larger [public] audience.”⁵

If the federal action may significantly affect the environment, APHIS must prepare an EIS.⁶ As a preliminary step, an agency may prepare an EA to decide whether the environmental impact of a proposed action is significant enough to warrant preparation of an EIS.⁷ If an agency decides not to prepare an EIS, it must supply a “convincing statement of reasons” to explain why a project’s impacts are insignificant.⁸ “The statement of reasons is crucial to determining whether the agency took a “hard look” at the potential environmental impact of a project.”⁹ An EA must “provide sufficient evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact.”¹⁰ NEPA regulations require the analysis of direct and indirect, as well as cumulative, effects in NEPA documents, including EAs.¹¹ The assessment must be a “hard look” at the potential environmental impacts of its action.¹² APHIS’ decisions in the EA must be “complete, reasoned, and adequately explained.”¹³

Whether there may be a significant effect on the environment requires consideration of two broad factors: context and intensity. A number of factors should be considered in evaluating intensity, including, “[t]he degree to which the proposed action affects public health or safety,” “[t]he degree to which the effects on the quality of the human

⁴ 42 U.S.C. § 4332(2)(C).

⁵ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349(1989).

⁶ *Steamboaters v. FERC*, 759 F.2d 1382, 1392 (9th Cir. 1985); *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146, 1150 (9th Cir. 1998) (citation omitted).

⁷ 40 C.F.R. § 1508.9.

⁸ *Save the Yaak v. Block*, 840 F.2d 714, 717 (9th Cir. 1988).

⁹ *Id.*

¹⁰ *Id.*

¹¹ See 40 C.F.R. §§ 1508.8, .9, .13, .18.

¹² *Blue Mountains Biodiversity v. Blackwood*, 161 F.3d 1208, 1211 (9th Cir. 1998). *Nat'l Parks & Conservation Ass'n*, 241 F.3d at 731 (quoting 40 C.F.R. § 1508.27).

¹³ *Northwest Coalition for Alternatives to Pesticides v. U.S. E.P.A.*, 544 F.3d 1043, 1052 n.7 (9th Cir. 2008).

environment are likely to be highly controversial,” “[t]he degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks,” “[t]he degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration,” “[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts,” and “[t]he degree to which the action may adversely affect an endangered or threatened species or its habitat.”¹⁴ An action may be “significant” if one of these factors is met.¹⁵

The Council on Environmental Quality (CEQ)

NEPA also established the Council on Environmental Quality and charged CEQ with the duty of overseeing the implementation of NEPA.¹⁶ The regulations subsequently promulgated by CEQ, 40 C.F.R. §§ 1500-08, implement the directives and purpose of NEPA, and “[t]he provisions of [NEPA] and [CEQ] regulations must be read together as a whole in order to comply with the spirit and letter of the law.”¹⁷ CEQ’s regulations are applicable to and binding on all federal agencies.¹⁸ Among other requirements, CEQ’s regulations mandate that federal agencies address all “reasonably foreseeable” environmental impacts of their proposed programs, projects, and regulations.¹⁹

The Administrative Procedure Act (APA)

Under the APA, an agency decision will be set aside if it is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.”²⁰ An agency decision would normally be arbitrary and capricious if “the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.”²¹ It is the agency’s burden to show that there is a “rational connection between the facts found and the choice made.”²² Where an agency decision is “irrational, unclear, or not supported by the data it purports to interpret,” it is arbitrary and capricious and contrary to law.²³

¹⁴ 40 C.F.R. § 1508.27(b)(2), (4), (5), (6), (7), (9).

¹⁵ *Ocean Advocates v. U.S. Army Corps of Eng'rs*, 361 F.3d 1108, 1125 (9th Cir.2004); *see also Nat'l Parks & Conservation Ass'n*, 241 F.3d at 731 (either degree of uncertainty or controversy “may be sufficient to require preparation of an EIS in appropriate circumstances.”).

¹⁶ *See* 42 U.S.C. §§ 4321, 4344.

¹⁷ 40 C.F.R. § 1500.3.

¹⁸ 40 C.F.R. §§ 1500.3, 1507.1; *see, e.g., Hodges v. Abraham*, 300 F.3d 432, 438 (4th Cir. 2002).

¹⁹ *See* 40 C.F.R. §§ 1502.4, 1508.8, 1508.18, & 1508.25.

²⁰ 5 U.S.C. § 706(2)(A).

²¹ *Mfrs' Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

²² *Id.*

²³ *See, e.g., Northwest Coalition for Alternatives to Pesticides (NCAP) v. U.S. E.P.A.*, 544 F.3d 1043, 1052 n.7 (9th Cir. 2008).

I. The Magnitude and Significance of the Precedent-Setting Proposed Field Trials Necessitates an EIS. APHIS Cannot Avoid An EIS by Attempting to Separate Each Trial and Analyze Only their Individual Parts.

APHIS should have completed an EIS because of the unprecedented size and scope of the proposed field trials. APHIS proposes to permit dozens of field tests on a total of 329.4 acres with up to 260,000 genetically engineered trees in seven states for up to 7-9 years or until the trees reach maturity. (EA at 28). APHIS acknowledges that the permits request release of flowering GE Eucalyptus on “many sites and in a number of new States and locations.” (EA at 5). APHIS prepared the EA because “there is a concern that the increased number of locations and size of the releases that would be allowed to flower could potentially result in the release of pollen and/or seed; which would lead to a lack of confinement of the field tests and impacts to the environment if trees could escape and establish in the environment.” (EA at 5).

That APHIS believes an EA is appropriate for an expansion of this magnitude (when an EA was also appropriate for a single field trial of 1.1 acres) is arbitrary and capricious. Past USDA actions of far narrower scope and magnitude have properly required an EIS.²⁴ APHIS’ view that this trial is small is contrary to the evidence: this field test is unprecedented in its size as for transgenic trees in the U.S. This is the first attempt to use engineered sterility as biocontainment at this scale. This test is on the same transgenic trees that are the first pending deregulation petition. In addition, APHIS has altogether neglected critical potential impact assessments involved in the scope here, such as the contamination risk involved in transporting huge quantities of the GE trees to the various test sites, the contamination risk and consequent seed dispersal caused by large storm events,²⁵ and known toxicity to animals.²⁶ Furthermore that sections of APHIS’s EA recommending the approval of field testing on over 300 acres are wholesale cut and paste from the agency’s previous 2007 EA recommending field testing on 1.1 acres illustrates that APHIS has not adequately assessed the massive scale of its current proposal.

Nor can APHIS evade the EIS requirement by attempting to break down the field trials into individual part in order to minimize their impacts. CEQ regulations establish that “[s]ignificance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.”²⁷ Yet breaking down the proposed field test into small component parts (twenty-nine sites across seven states) is precisely what has occurred in this instance to avoid a significance determination. (EA at 4-13). For

²⁴ See, e.g., *Native Ecosystems Council v. U.S. Forest Service*, 418 F.3d 953, 959 (9th Cir. 2005) (EIS for elimination of 620 of 14,112 available acres of elk hiding cover); *City of Carmel-By-The-Sea v. U.S. Dept. of Transp.*, 123 F.3d 1142 (9th Cir. 1997) (EIS for the removal of approximately 12 acres of wetlands); *Enos v. Marsh*, 769 F.2d 1363, 1366 (9th Cir. 1985) (EIS for the construction of a 92 acre harbor).

²⁵ National Oceanic and Atmospheric Administration, National Climate Data Center (accessed 7/2/2009). Storm Event [Online database]. Retrieved from <http://www4.ncdc.noaa.gov/cgi-win/wwwcgi.dll?wwevent~storms>.

²⁶ Medicinal Plants for Livestock, Eucalyptus spp., <http://www.ansci.cornell.edu/plants/medicinal/eucalyp.html>

²⁷ 40 C.F.R. § 1508.27(b).

example, in dismissing the potentially significant impact that the proposed field testing might have on soil hydrology, “APHIS concludes that while the effects on hydrology, including watershed and aquifers, are unknown and uncertain for very large plantings of *Eucalyptus*, these small-scale field test are unlikely to have any significant negative impact.” (EA at 30). However CEQ regulations make clear that actions need to be assessed cumulatively, not individually.²⁸ APHIS makes a similar error regarding the potential impacts of the field testing by fire, concluding that “[t]hese plantings are small (none greater than 20 acres).” (EA at 26). Yet the proposed action cumulatively would permit the field testing of Eucalyptus, which APHIS acknowledges to be “highly flammable,” on an area over sixteen times that, not including land adjacent to the field test sites from which or to which a fire could easily spread. (Id.) Similarly, APHIS rejects the possibility of a significant allelopathic impact on plants and animals near the Eucalyptus field test sites, in spite of “inconclusive data” about Eucalyptus’ allelopathic effects, using the same faulty logic that “[s]ince all the field tests are confined and limited in size, any allelopathic effects should be small.” (EA at 32). Contrary to APHIS’s analysis, the CEQ regulations instruct agencies to assess the both the action and its potential impacts cumulatively. APHIS’s EA is deficient because it entirely fails to address the potential cumulative impacts of the proposed action as required by NEPA. An EIS is required.

II. The Close Proximity of the Proposed Field Tests to Protected Areas and Potential Foreseeable Impacts to those Areas Requires an EIS.

APHIS failed to assess the close proximity of the proposed field test sites to protected, ecologically sensitive areas across the U.S. south and must complete an EIS assessing, *inter alia*, potential impacts to these specific protected areas. Whether there may be a significant effect on the environment that may require an EIS requires consideration of two broad factors: context and intensity. The CEQ regulations provide ten intensity factors that must be considered in assessing the severity of impact of an action,²⁹ including “[u]nique characteristics of the geographic area such as *proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.*”³⁰

Of the twenty-one different counties in which the proposed field tests will occur, eight different counties border or contain National Forest areas. Nine different counties border or contain parts of a National Wildlife Refuge area, four border or contain parts of a National Wilderness area, one contains parts of a National Preserve, and one contains parts of a National Seashore. All of the counties proposed for field testing have ecologically protected areas within a 50-mile radius of the county. Some areas of particular concerns are:

- The field test site in Baldwin County, Alabama. Baldwin County, Alabama is home to part of the Bon Secour National Wildlife Refuge. The Bon Secour National Wildlife

²⁸ 40 C.F.R. § 1508.27(b)

²⁹ 40 C.F.R. § 1508.27(b)

³⁰ *Id.*

Refuge comprises “one of the largest undeveloped parcels of land on the Alabama coast” and provides habitat for the endangered Alabama beach mouse and serves as a nesting site for loggerhead and Kemp’s Ridley sea turtles.³¹ The US FWS lists parts of Baldwin County as critical habitat for the Perdido Key beach mouse and the piping plover.³²

- The Saint Landry’s Parish site in Louisiana. Saint Landry’s Parish contains part of Atchafalaya National Wildlife Refuge. Atchafalaya National Wildlife Refuge comprises a significant portion of the largest bottomland hardwood swamp in the country and it provides habitat for a threatened subspecies of black bear called the Louisiana black bear along with the American alligator, which is also listed as threatened.
- The two field test sites in Berkeley County, South Carolina. Berkeley County, Georgia contains parts of the Francis Marion National Forest which features Revolutionary War battle sites, a Prehistoric Indian shell mound, and giant cypress and tupelo groves, some with trees over 1000 years old, containing black bear, alligator, and endangered red-cockaded woodpecker habitat.³³ Both the National Audubon Society and the American Bird Conservancy has designated The Francis Marion National Forest an Important Bird Area because it “provides essential stopover habitat for autumn and spring migrating birds, as well as critical breeding habitat.”³⁴ Hurricane Hugo razed more than a third of the forest in 1989 leading to dense understory re-growth and causing “a dangerous risk of catastrophic wildfire,” which the Forest Service has mitigated using controlled burn techniques.³⁵
- The field test site in Charleston County, South Carolina. Charleston County contains parts of ACE Basin National Wildlife Refuge upon which the Grove Plantation House sits. The house is currently listed on the National Register of Historic Places. The National Wildlife Refuge provides sanctuary for endangered wood storks and shortnose sturgeon as well as American alligators and bald eagles. The Fish and Wildlife Service notes that ACE Basin “is one of the largest undeveloped estuaries on the East Coast of the United States” and “is extremely important to...migrating birds...”³⁶
- The field test sites in Hardin County, Texas and the two sites in Jasper County, Texas. Hardin County, Texas contains part of Big Thicket National Preserve, the first

³¹ Fish and Wildlife Service, <http://www.fws.gov/bonsecour/>

³² U.S. FWS Critical Habitat Portal, <http://criticalhabitat.fws.gov/>

³³ Francis Marion National Forest - USDA Forest Service – Southern Region, <http://www.fs.fed.us/r8/fms/fmarion/index.php?p=1.1.0.1>

³⁴ Francis Marion National Forest - USDA Forest Service – Southern Region, <http://www.fs.fed.us/r8/fms/fmarion/recreation/birding.overview.php?p=1.1.2.1>

³⁵ Francis Marion National Forest - USDA Forest Service – Southern Region, <http://www.fs.fed.us/r8/fms/fmarion/fire/prescribedfire.php?p=1.1.12.2>

³⁶ Ernest F. Hollings ACE Basin National Wildlife Refuge, <http://www.fws.gov/southeast/pubs/facts/abscon.pdf>

National Preserve in the National Park System, while Jasper County borders the National Preserve.³⁷ Big Thicket National Preserve features “some of the richest [biological] diversity in North America.” The preserve has been added to the list of Globally Important Bird Areas by the American Bird Conservancy as well as the list of International Biosphere Reserves, one of only 47 such sites in the country. Big Thicket National Preserve provides habitat to “85 tree species, more than 60 shrubs, and nearly 1,000 other flowering plants, including 26 ferns and allies, 20 orchids, and four of North America's five types of insect-eating plants. Nearly 186 kinds of birds live here or migrate through. Fifty reptile species include a small, rarely seen population of alligators.”³⁸

- The field test site in Jefferson County, Texas. In addition to containing part of Big Thicket National Preserve (see above), Jefferson County, Texas also contains McFaddin National Wildlife Refuge and Texas Point National Wildlife Refuge. Both McFaddin and Texas Point “provide important feeding and resting habitat for migrating and wintering populations of waterfowl.”³⁹ McFaddin National Wildlife Refuge “consists of the largest remaining freshwater marsh on the Texas Coast.”⁴⁰ Among other techniques, refuge staff conduct prescribed burns and control exotic plant species to manage the marsh. Archeological remnants found within the McFaddin National Wildlife Refuge reveal that the area was inhabited by Atakapa and Karankawa Indians 10-12,000 years ago.
- The four field test sites in Newton County, Texas. Newton County, Texas as well as Jasper County, where two other field testing sites will be, border Sabine National Forest. The Sabine National Forest, an “ecologically diverse and rich forest environment inhabited for at least 10,000 years[,]” contains a National Historic Trail and provides habitat for numerous species of warm-water fish and neo-tropical migratory birds.⁴¹ The Sabine National Forest also provides habitat for the endangered red-cockaded woodpecker. The National Forest website notes that “[i]n a recent 10-year period, there was an average of 12 wildfires per year.”⁴²
- The field test site in Columbia County, Florida. Columbia County contains parts of Osceola National Forest and the Big Gum Swamp Wilderness and borders the Okefenokee National Wildlife Refuge. Osceola National Forest is an “extremely important water recharge area[s].”⁴³ The endangered red-cockaded woodpecker finds habitat in the Osceola’s stands of cypress, black gum, bay, and pine trees while the threatened American alligator dwells in the wetlands below.⁴⁴ The Osceola National

³⁷ Big Thicket National Preserve (U.S. National Park Service), <http://www.nps.gov/bith/index.htm>

³⁸ Big Thicket National Preserve – Big Thicket Biological Crossroads, <http://www.nps.gov/bith/bigthicketbiologicalcrossroads.htm>

³⁹ McFaddin National Wildlife Refuge, <http://www.fws.gov/refuges/profiles/index.cfm?id=21526>

⁴⁰ *Id.*

⁴¹ Sabine National Forest, http://www.fs.fed.us/r8/texas/recreation/sabine/sabine_gen_info.shtml

⁴² *Id.*

⁴³ Osceola National Forest – U.S. Forest Service – Southern Region, <http://www.fs.fed.us/r8/florida/osceola/resources/resources.php?p=1.1.7.3>

⁴⁴ *Id.*

Forest also contains part of a Florida National Scenic Trail which passes through OluStee Battlefield, a State Historic Site where a Civil War Battle took place.⁴⁵ Okefenokee National Wildlife Refuge Area is “one of the oldest and best preserved freshwater systems in America.”⁴⁶ The refuge is home to over 400 species of animals including the endangered red-cockaded woodpecker and the threatened American alligator. American Indians inhabited the area as early as 4,500 years ago.⁴⁷

- The two field test sites in Gadsden County, Florida. Gadsden County borders Apalachicola National Forest, the largest forest in Florida.⁴⁸ According to the National Forest website, the forest contains Leon Sinks, “an unusual geological area of caverns and sinkholes” as well as Fort Gadsden, a relic from the Civil War.
- The field test site in Highlands County, Florida. Highlands County contains Lake Wales Ridge National Wildlife Refuge, which is home to twenty-two different threatened or endangered species of plants, with an nine additional plant candidates pending.⁴⁹ Four listed vertebrate species and 40 rare invertebrate species live in Lake Wales Ridge National Wildlife Refuge.
- The field test site in Highlands County, Florida. Highlands County contains Lake Wales Ridge National Wildlife Refuge, which is home to twenty-two different threatened or endangered species of plants, with nine additional plant candidates pending protected status.⁵⁰ Four listed vertebrate species and 40 rare invertebrate species live in Lake Wales Ridge National Wildlife Refuge.
- The field test site Marion County, Florida. Marion County, Florida contains parts of the Ocala National Forest and Juniper Prairie Wilderness. Over 600 bodies of water lie within the Ocala National Forest including four “unique and distinctive” natural springs, the St. Johns River, the longest river in the Florida, and Lake George, the second largest lake in Florida.⁵¹ The “Ocala National Forest is one of the most heavily used in the United States.” The St. Johns River hosts endangered manatees as well as sharks and rays. The Ocala National Forest includes the Juniper Springs Recreational site, “[t]he crown jewel of National Forest in Florida CCC recreation construction,” which was built in 1935 and features a limestone and wood millhouse, and the Sweetwater Cabin, built in 1934 and used for the backdrop of the classic film

⁴⁵ Osceola National Forest – U.S. Forest Service – Southern Region,

<http://www.fs.fed.us/r8/florida/osceola/recreation/hiking.overview.php?p=1.1.3.6>

⁴⁶ Okefenokee National Wildlife Refuge, <http://www.fws.gov/okefenokee>

⁴⁷ Okefenokee National Wildlife Refuge, <http://www.fws.gov/okefenokee/History.html>

⁴⁸ Apalachicola National Forest – US Forest Service – Southern Region,

<http://www.fs.fed.us/r8/florida/apalachicola/index.php>

⁴⁹ Lake Wales Ridge National Wildlife Refuge, <http://www.fws.gov/refuges/profiles/index.cfm?id=41577>

⁵⁰ Lake Wales Ridge National Wildlife Refuge, <http://www.fws.gov/refuges/profiles/index.cfm?id=41577>

⁵¹ Ocala National Forest – US Forest Service – Southern Region, <http://www.fs.fed.us/r8/florida/ocala/>;

Ocala National Forest – US Forest Service – Southern Region,

<http://www.fs.fed.us/r8/florida/ocala/attractions/lakes.php?p=1.1.1.3>

The Yearling.⁵² Ocala National Forest also includes a road designated as an official state Scenic Byway traversing prime Florida black bear habitat and some of “Florida’s most pristine ecosystems.”⁵³ Inside Ocala National Forest and Marion County, Congress designated the Juniper Prairie Wilderness as a place “where the earth and its community of life are untrammelled by man, [and] protected and managed to preserve [its] natural beauty.”⁵⁴

- The three field test sites in Taylor County, Florida. Taylor County, Florida lies adjacent to St. Marks National Wildlife Refuge and St. Marks Wilderness. St. Marks National Wildlife Refuge’s website boasts that the protected area “currently provides habitat for seven federally-listed endangered species” including the red-cockaded woodpecker, wood stork, West Indian manatee, bald eagle, Atlantic green turtle, Atlantic loggerhead turtle, and the leatherback turtle, and formerly provided habitat for two additional endangered species, the Florida panther and the ivory-billed woodpecker.⁵⁵ St. Marks National Wildlife Refuge specifically recognizes exotic plants as a threat to management of the refuge noting that “[n]onnative species threaten approximately 66% of all threatened and endangered species” and that “[n]onnative species are considered the second most important threat to biodiversity, only surpassed by direct habitat destruction.” Parts of Taylor County are also listed a critical habitat for the piping plover.⁵⁶

APHIS entirely failed to consider a crucial factor for significance, close proximity of many of the proposed field test sites to areas with “[u]nique characteristics...such as proximity to historic and cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas” and must do so in an EIS. The close proximity of the proposed test sites to protected areas of vast ecological and cultural significance raises a substantial question whether there will be significant impacts, including risk of fire, harm to threatened or endangered species, and effects on the water table.

Our understanding of the contamination potential from future plantings of GE trees is largely based on known contamination incidents from GE food crops and experimental plantings of engineered grasses. While there has not yet been a fully comprehensive study of crop contamination from GE varieties, several well-documented incidents should alert APHIS to the reasonably foreseeable nature of the problem. The recent 2008 GAO

⁵² Ocala National Forest – US Forest Service – Southern Region, <http://www.fs.fed.us/r8/florida/ocala/attractions/historic.php?p=1.1.1.2>

⁵³ Ocala National Forest – US Forest Service – Southern Region, <http://www.fs.fed.us/r8/florida/ocala/attractions/scenicByway.php?p=1.1.1.5>

⁵⁴ Ocala National Forest – US Forest Service – Southern Region, <http://www.fs.fed.us/r8/florida/ocala/attractions/wilderness.php?p=1.1.1.7>

⁵⁵ St. Marks National Wildlife Refuge – Fish and Wildlife Service – Southeast Region, <http://www.fws.gov/saintmarks/endspecies.html>

⁵⁶ U.S. FWS Critical Habitat Portal, <http://critical.habitat.fws.gov/>

Report⁵⁷ documents six events of GE crops contaminating the food and feed supply, including the 2000 StarLink Corn incident, causing \$26 to \$288 million in economic damages; the 2002 Prodigene Corn contamination incident where a GE corn designed to create a pig vaccine protein contaminated non-GE corn; the 2004 Syngenta Bt Corn incident where a pesticidal Bt corn determined not to be suitable for commercialization was illegally released onto 37,000 acres; the 2006 Event 32 Corn incident where 72,000 acres were planted to 3 lines of corn contaminated with regulated GE pesticidal corn; and the 2006 Liberty Link Rice 601 and 604 incident where GE rice contaminated export rice stocks causing economic damages of over \$1 billion.⁵⁸ Such contamination events are not isolated incidents. Rather, as the GAO explained, “the ease with which genetic material from crops can be spread makes future releases likely.”⁵⁹

We know from past experience that USDA field trials of transgenic crops can contaminate wild places.⁶⁰ Two incidents of transgenic contamination of wild relatives have been studied in some detail – the transmission of an herbicide-tolerance gene from oilseed rape (canola) to weedy wild turnip hybrids in Canada; and the detection of herbicide-tolerant grasses up to 21 kilometers from a test site in the US state of Oregon.⁶¹ In the latter case, which may be the closest precedent and most instructive here, APHIS’ administrative conclusions and legal arguments on contamination from one field test site were fatally belied when transgenic bentgrass was confirmed to be contaminating the Crooked River National Grassland in Oregon, despite APHIS’s assurances that “containment” could be maintained.⁶² In 2004, researchers from the US Environmental Protection Agency found numerous grasses within 2 km of the experimental plot—as well as two samples 14 and 21 km away—that were tolerant to glyphosate. Upon genetic analysis, they were found to contain one of the major components of the inserted DNA that imparts this trait.⁶³ In a follow-up study two years later, researchers determined that the transgene had established itself in resident grass populations, as well as in a non-GE bentgrass that had been planted nearby to facilitate monitoring of potential gene flow.⁶⁴ With their investigation limited to publicly accessible areas within 310 m² of the test plot, the researchers found nine established transgenic plants downwind, “spread over an appreciable distance beyond the border of the control area.”⁶⁵ Through further DNA analysis, they determined that the contamination had been caused by a combination of

⁵⁷ GAO, GENETICALLY ENGINEERED CROPS: AGENCIES ARE PROPOSING CHANGES TO IMPROVE OVERSIGHT, BUT COULD TAKE ADDITIONAL STEPS TO ENHANCE COORDINATION AND MONITORING, Report to the Committee on Agriculture, Nutrition, and Forestry, U.S. Senate, November 2008.

⁵⁸ 2008 GAO Report at 3.

⁵⁹ *Id.*

⁶⁰ <http://www.usda.gov/wps/portal/usdahome?contentidonly=true&contentid=2007/11/0350.xml>

⁶¹ Jay R. Reichman, *Establishment of transgenic herbicide-resistant creeping bentgrass (Agrostis stolonifera L.) in nonagronomic habitats*, *Molecular Ecology* (2006).

⁶² *International Center for Technology Assessment v. Johanns*, 473 F. Supp. 2d 9 21-22 (D. D.C. 2007).

⁶³ Lidia S. Watrud, et al., “Evidence for landscape-level, pollen-mediated gene flow from genetically modified creeping bentgrass with CP4 EPSPS as a marker”, *Proceedings of the National Academy of Sciences, USA*, Vol. 101, No. 40, pp. 14533-14538, October 5, 2004.

⁶⁴ Jay R. Reichman, et al., “Establishment of transgenic herbicide-resistant creeping bentgrass (*Agrostis stolonifera L.*) in nonagronomic habitats”, *Molecular Ecology* Vol. 15, pp. 4243–4255, 2006.

⁶⁵ *Id.* at 4252.

pollen and GE seed dispersal. As tree pollen can potentially travel two orders of magnitude farther than grass pollen, these experiments suggest that effective containment of contamination from GE trees would be highly improbable.

One crucial impact to be assessed with regard to these protected areas is the potential for biological contamination, which in and of itself is an impact cognizable under NEPA.⁶⁶ The potential establishment of transgenic Eucalyptus trees in native forests of the southern United States would adversely impact the interests of the public, our members, and allied organizations who all have recreational and aesthetic interests in viewing and/or studying native plant species, especially trees, which species are themselves threatened by the possible invasion of the GE Eucalyptus.⁶⁷ The EIS must also look at all the associated potential risks to protected areas that are caused by and/or related to that contamination, such as the risk that the transgenic trees, once established, could harm biodiversity in the ecosystems, wildlife, or watersheds. For example, the proximity of natural areas that could increase the likelihood of particular animals entering the tests sites, or that could provide sites for escaped seedling to establish is not assessed.

III. The EA is Generally Deficient in its Analysis of Foreseeable Environmental Impacts. An EIS is Required.

Establishment and Invasiveness: A Genetically Engineered Kudzu

As an introduced species, this GE hybrid may become invasive, thereby seriously disrupting native ecosystems, as has been the case with several other Eucalyptus species in California. APHIS' claim that the GE Eucalyptus will not be invasive is belied by the fact that the Eucalyptus's susceptibility to cold is what limits its establishment in most of the southern United States. The whole point of the transgene is to overcome this barrier in order to have commercial plantations in these states. All that APHIS appears to know is that one barrier to possible invasiveness would potentially be removed by the addition of the cold tolerant genes, the trees' inability to survive in the cold. The very same vigor that the ArborGen touts as a point in favor of the hybrid, would lead to its becoming an invasive. Eucalyptus species are already highly invasive in California and in other countries. If sterility of the transgenic hybrid is not permanent and 100%, both current Eucalyptus in Florida and the hybrid itself may acquire the ability to become invasive across the southeastern U.S. Whereas the best predictor of whether a taxon might be invasive in a new range is whether it has become invasive elsewhere, we have no such information for novel taxa such as this one. APHIS must undertake further analysis and an EIS before allowing a flowering field trial of this size and duration.

⁶⁶ See, e.g., *Geertson Seed Farms, et al. v. Johanns*, 2007 WL 518624 (N.D. Cal. 2007) *aff'd*, 541 F.3d 938 (9th Cir. 2008) (NEPA violations for failure to assess, *inter alia*, risk of biological contamination from transgenic crop).

⁶⁷ See, e.g., *International Center for Technology Assessment v. Johanns*, 473 F. Supp. 2d 9, at 22 (threat of spread of transgenic bentgrass to, *inter alia*, protected grassland was injury to plaintiffs).

APHIS's argument is that the cold tolerance gene is "not expected to alter the characteristics of the engineered plants other than imparting tolerance to cold temperatures" (EA at 18) and that, while the gene "could make the engineered Eucalyptus more adapted to cold temperatures in the southern United States, [] this trait *in and of itself* would not impart invasive or weediness characteristics to the engineered plants." (EA at 20) (emphasis added). Instead of analysis and hard data explaining why the common sense conclusion should not be reached – that if you engineer a plant to be cold-tolerant, it is then more likely to survive and thrive in a colder climate – APHIS repeats the above sentence like a mantra: that the trait "*in and of itself* would not impart invasive or weediness characteristics to the engineered plant." (e.g., EA at 20, 25). This mantra is not analysis nor has hard data supporting it. It is unsupportable for APHIS to dismiss the possibility that this hybrid could become invasive if it could survive the cold without performing a thorough analysis of its competitiveness. All that is known is that one barrier to possible invasiveness or establishment would be removed by the addition of the cold-tolerance genes, i.e., the current inability to survive the cold. APHIS "cannot avoid preparing an EIS by making conclusory assertions that an activity will have only an insignificant impact on the environment."⁶⁸ "If an agency opts not to prepare an EIS, it must put forth a 'convincing statement of reasons' to explain why a project's impacts are insignificant."⁶⁹

Rather than dismissing the engineering of cold tolerance, APHIS should apply NEPA's "hard look" in an EIS to whether or not it could increase invasiveness. There is at least one precedent for cold tolerance as a contributor to invasiveness. In Britain, the introduced Rhododendron, *R. ponticum*, is a destructively invasive species whose range is believed to have been enhanced by acquiring cold tolerance from another introduced Rhododendron species.⁷⁰ *R. ponticum* comes from the Iberian Peninsula and is not well adapted to the colder climate of Britain, especially some of the colder regions of the British Isles. *R. ponticum* has been shown to have acquired genes from the cold-tolerant species, *R. catawbiense*. Hybrid *R. ponticum* now causes destruction of native heath ecosystems,⁷¹ with mitigation costing millions of dollars. Despite these data, there is no evaluation in the EA of cold tolerance contributing to invasiveness or harm.

Moreover the cold-tolerance genetic construct could have other unanalyzed effects on the environment besides invasiveness, as the genes conferring cold tolerance in this field trial are known to affect the expression of many other genes including genes for drought tolerance. APHIS failed to consider this important aspect of the problem and did not include any assessment of these potential impacts to the trees, pollinators, or the ecosystems.

⁶⁸ *Ocean Advocates v. U.S. Army Corps of Engineers*, 402 F.3d 846, 864 (9th Cir. 2005).

⁶⁹ *Blue Mountains*, 161 F.3d at 1212.

⁷⁰ Milne, RI, and Abbott, RJ. 2000. Origin and evolution of invasive naturalized material of *Rhododendron ponticum* L. in the British Isles, *Molecular Ecology* 9:541-556; Ellstrand, NC, "Dangerous Liaisons? When Cultivated Plants Mate with Their Wild Relatives," 2003, The Johns Hopkins University Press, Baltimore, MD.

⁷¹ Mitchell, RJ, et al. 2000. Estimates of nutrient removal during heathland restoration on successful sites in Dorset, southern England. *Biological Conservation* 95:233-246.

APHIS claims that the parent Eucalyptus is not invasive in the south (EA at 16) but it is mistaken: In Florida *E. grandis* is now established in the wild, in addition to *E. robusta* and *E. torelliana*. “To take the required ‘hard look’ at a proposed project’s effects, an agency may not rely on incorrect assumptions or data.”⁷² In fact, there is feral *E. grandis* in *the same county* where field trials are planned, Glades County, FL. This risk was not mentioned or assessed in the EA. Nowhere did APHIS assess the conditions in Florida that allowed these types of Eucalyptus to escape and establish in the wild and how that precedent applies to the transgenic Eucalyptus at issue here.

APHIS notes that no Eucalyptus species is classified as invasive in Florida, including one of the parents of the GE Eucalyptus, *E. grandis*, but the University of Florida’s IFAS Assessment of Non-native Plants in Florida’s Natural Areas updated conclusion for *E. grandis* is now: “Predicted to be invasive: recommend only under specific management practices that have been approved by the IFAS Invasive Plant Working Group.”⁷³ See Comments of the Florida Exotic Pest Plant Council (FL EPPC), APHIS-2008-0059-0164: “*Eucalyptus grandis* does produce flowers and seed in Florida and may cause pollen production in the transgenic taxon. Ironically, while one of the primary intents of the proposed cultivation is to allow flower production, the specific management practices under which the four cultivars of *E. grandis* are recommended by the University of Florida include harvest of all biomass before seeds are produced.”

Finally, contrary to APHIS’ apparent baseline injury for triggering the “may” significantly effect determination requiring an EIS, transgenic cold tolerant Eucalyptus need not become a technically invasive or weedy species to be potentially harmful to the environment or to warrant an EIS. (EA at 19). As discussed above in section II, *the very presence of permanent transgenic plants or trees in the natural environment is a cognizable potential impact* that must also be analyzed pursuant to NEPA.

Regarding establishment, APHIS claims that seeds will be limited by the fact that they need contact with “bare mineral soil and lack of competition” (EA at 20-21), but these sites are fairly common in the southeast, including in riparian zones, flood deposits, eroded areas, and fire sites.

Cross-pollination

Regarding ornamental plantings of Eucalyptus, it does not seem that APHIS examined that there are not plantings within the pollination distance. This possibility needs to be analyzed in the EIS.

APHIS claims that the barnase gene for altered fertility is “likely to reduce the ability of the trees to produce progeny” and will “further reduce the likelihood of release of the regulated article into the environment.” (EA at 18). APHIS bases its conclusion that the gene construct will succeed in stopping viable pollen on only the earlier, much smaller

⁷² *Native Ecosystems Council*, 418 F.3d at 964; 40 C.F.R. § 1500.1(b) (“Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA.”).

⁷³ http://plants.ifas.ufl.edu/assessment/predictive_response_forms.html

field tests. (See EA Appendix I, at 39). This is a slender reed to rest such an important conclusion. Exactly how many flowers were analyzed in this previous test and was the analysis a large enough sampling to predict the method will work for this expansive field test? Similarly with self-incompatibility of the transgenic trees, APHIS bases its conclusion on only the results of the one year, one location earlier field test. APHIS should complete a full EIS analyzing the efficacy of these measures before approving such a massive field test.

Contamination By Severe Weather Events

APHIS notes that the Eucalyptus seed is “very light and small” but claims it is not likely to susceptible to wind dispersal, limited to twice the radius of the tree. (EA at 20). However strong winds and severe storm and rain events are not accounted for, not even mentioned in the EA. The trees will stay in the ground for 9 years. According to the National Climate Data Center’s Storm Event database, there were a total of 4,645 hurricanes, tropical storms, and tornadoes to his AL, FL, GA, LA, MS, SC, and TX in the last nine years, between January 2000 and March 2009.⁷⁴ In other countries where Eucalyptus have been introduced, they are well known for escaping and colonizing native ecosystems. Almost every test site location in the proposal is vulnerable to the threat of a hurricane or other severe weather event. APHIS provided no analysis of the impacts of severe weather events to its ability to contain the GE Eucalyptus plantings, failing to consider an important issue. In an EIS APHIS should examine how far the seed from these trees could actually be dispersed by strong winds, and how often storms producing high winds may occur in the areas of the proposed field tests.

Nor did APHIS examine the impacts of global warming, which will increase extreme weather events conducive to the escape of these transgenic trees. Global warming also will foreseeably impact the areas in which the trees could grow. APHIS failed to consider any impacts from or to global warming in the EA.

Impacts of the Transgenes on Other Species

According to APHIS’ Environmental Assessment, the ArborGen Eucalyptus hybrid contains four inserted transgenic traits:

- C-Repeat Binding Factor (CBF protein) that induces cold tolerance, with an altered promoter aimed to reduce impairments in plant metabolism that are commonly associated with the action of the CBF protein alone;
- An unspecified gene construct for altered lignin;
- Barnase gene for reduced fertility, through partial digestion of RNA;
- Kanamycin resistance marker gene.

⁷⁴ National Oceanic and Atmospheric Administration, National Climate Data Center (accessed 7/2/2009). Storm Event [Online database]. Retrieved from <http://www4.ncdc.noaa.gov/cgi-win/wwwcgi.dll?wwevent~storms>.

APHIS concludes that the genes conferring cold tolerance are not expected to produce any toxic substances or “cause risk to the environment” (EA at 18), however no data are given to support this conclusion. APHIS’ decisions in the EA must be “complete, reasoned, and adequately explained.”⁷⁵ A purportedly beneficial trait under one set of conditions can become a deleterious trait under another set of conditions (e.g., gene by environment interactions). The trees are going to be available to pollinators, soil organisms, herbivores and other animals in the test sites, The recognition that genetically engineered organisms will interact with many other species to produce potentially unexpected outcomes is crucial to any meaningful analysis and must be included in an EIS.

Fire

APHIS also fails to adequately consider the many impacts of increased and prolonged Eucalyptus planting itself, independent of and in addition to transgenes, that could be harmful. In regions where droughts occur, Eucalyptus trees are known to be at high risk of catching fire. The southeast U.S. is currently in the midst of such a drought. APHIS states that, although invasive Eucalyptus were responsible for significant fires in California and are known to be highly flammable, in which build-up of fire fuel happens very rapidly, no EIS is required assessing the fire risk here because the probability that these field tests will increase the risk and severity of forest fires in their respective locations is very small. (EA at 26). Again, notably APHIS is relying on rationale that does not assess the reasonably foreseeable impacts of future commercial plantations. Nor does the analysis include the cumulative impact of all the field tests, or of the field tests with any ornamental Eucalyptus currently or planned to be grown in the states and counties where the tests are proposed. Nor does APHIS address the impacts of the plantings on current or foreseeable drought conditions. *See infra* cumulative impacts section.

Soil Hydrology

APHIS admits that Eucalyptus generally have impacts on hydrology and that “large widespread plantings” could have potential impacts on hydrology; and that the potential impacts of such plantings are “unknown.” (EA at 29). APHIS acknowledges that “due to a lack of available data” it is difficult to determine the significance of the effects of large scale planting. (EA at 30). APHIS notes that plantings could reduce stream flows and potentially eliminate low flows. APHIS notes further that elimination of low flows could have important ramifications for protected species. (EA at 29-30).

Further, USFS data indicated to APHIS that “small” plantings like those in this proposal “may” have localized and negligible impacts on the watershed. (EA at 30). USFS also noted that modeling would be useful to determine impacts. APHIS does not disclose the modeling data provided by Syngenta or USFS’s full comments, which is necessary for informed public review and comment. That plantings such as these “may” or may not

⁷⁵ *Northwest Coalition for Alternatives to Pesticides v. U.S. E.P.A.*, 544 F.3d 1043, 1052 n.7 (9th Cir. 2008).

have impacts is sufficient to trigger the requirement that APHIS complete an EIS on these impacts before approving these permits. APHIS describes the risk as very small, but NEPA requires that an EIS must be prepared if substantial questions are raised as to whether a project may cause significant environmental degradation.⁷⁶ “The plaintiff need not show that significant effects will in fact occur, but if the plaintiff raises substantial questions whether a project may have a significant effect, an EIS must be prepared.”⁷⁷ As the Ninth Circuit has recognized, “[t]his is a low standard.”⁷⁸

APHIS “cannot avoid preparing an EIS by making conclusory assertions that an activity will have only an insignificant impact on the environment.”⁷⁹ “If an agency opts not to prepare an EIS, it must put forth a ‘convincing statement of reasons’ to explain why a project’s impacts are insignificant.”⁸⁰ The Ninth Circuit has held that “[t]he statement of reasons is crucial to determining whether the agency took a ‘hard look’ at the potential environmental impact of a project.”⁸¹

APHIS also again declines to address the larger impacts of the reasonably foreseeable outcome of these permits and field trials, which will be large-scale plantations, while at the same time admitting that the impacts of such plantations on hydrology including watersheds and aquifers are “unknown and uncertain.” (EA at 30).

Altered Lignin

The ability to provide meaningful comments is significantly hampered by APHIS’ failure to disclose the details of the gene construct, a failing that in and of itself is violative of NEPA and the APA. *See infra* Section IV.

Lignin is an important structural polymer that is also significantly responsible for the high levels of insect and disease resistance in trees. The very fact that it is difficult to break down lignin has been shown to be essential to the resiliency of native tree species in the wild. Accordingly, the consequences of a reduced lignin trait spreading from transgenic trees to native forests could be severe and irreversible. The severity of the potential these types of irreversible impacts must be accounted for and assessed, which it was not here.

Fast growing, reduced lignin GE trees, growing undetected in a native forest setting as the result of gene escape, could die off at an early age due to their inability to cope with environmental stresses. Their reduced lignin would cause them to decompose rapidly, damaging soil structure and emitting carbon, contributing to global warming. Their faster growth at the seedling and sapling stage, however, could give them an evolutionary advantage over their non-modified cousins, resulting in a domination of GE low-lignin

⁷⁶ *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1216 (9th Cir. 1998).

⁷⁷ *Klamath Siskiyou Wildlands Center v. Boody*, 468 F.3d 549, 562 (9th Cir. 2006)

⁷⁸ *Id.*

⁷⁹ *Ocean Advocates v. U.S. Army Corps of Engineers*, 402 F.3d 846, 864 (9th Cir. 2005).

⁸⁰ *Blue Mountains*, 161 F.3d at 1212.

⁸¹ *Center for Biological Diversity v. National Highway Traffic Safety Administration*, 538 F.3d 1172, 1220 (9th Cir. 2008) (“CBD”) (citations omitted).

seedlings and saplings in the forest. How these impacts will affect the forest ecosystem has not been assessed.

Lower levels of lignin contribute to physically weaker trees. When exposed to storms with severe winds, the trees could create a greater amount of fodder which presents a fire risk. Furthermore, the weakened trees could travel further to adjacent forest systems where the reduced-lignin trait could spread to other trees, potentially increasing their susceptibility to predators and disease and weakening their structural rigidity.

APHIS notes that the gene was used in previous field trials, which were a tiny percentage in scale of what is currently proposed. APHIS acknowledges there “might” be a risk that altered lignin could lead to an increase in insect or disease, but that the results of the previous field tests showed no difference. (EA at 19). In short, APHIS is gambling the results will be the same here. If the federal action may significantly affect the environment, APHIS must prepare an EIS.⁸² APHIS fails to provide a “convincing statement of reasons” to explain why a project’s impacts are insignificant⁸³ and has not taken NEPA’s required “hard look” at these potential impacts.⁸⁴

The details of the past studies/field tests upon which APHIS bases its decision that there is no risk are not revealed in the EA. APHIS must “show its work” – completely, rationally, and adequately explained -- if it wishes to properly support its conclusion that is otherwise not discernible in the EA.⁸⁵

APHIS also notes that the earlier permits required monthly inspections and reporting (EA at 19); however the current proposal is only for annual reporting. It is arbitrary and capricious for APHIS to allow for a dramatically more expansive field tests, covering a wide array of environments instead of only one location, and apply less rather than more oversight and permit requirements. APHIS’s permit conditions must also comply with the 2008 Farm Bill’s mandates, which they fail to do. *See infra* Section VIII.

IV. APHIS Failed to Adequately Analyze Cumulative Impacts, Including Individually Minor But Collectively Significant Actions and Reasonably Foreseeable Future Actions. An EIS is Required.

⁸² *Steamboaters v. FERC*, 759 F.2d 1382, 1392 (9th Cir. 1985); *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146, 1150 (9th Cir. 1998) (citation omitted).

⁸³ *Save the Yaak v. Block*, 840 F.2d 714, 717 (9th Cir. 1988).

⁸⁴ *Id.*

⁸⁵ *See, e.g., Northwest Coalition*, 544 F.3d at 1052 & n.7 (“In sum, the Final Order does not provide enough information to demonstrate a rational connection between the factors that the EPA examined and the conclusions it reached... where the agency's reasoning is irrational, unclear, or not supported by the data it purports to interpret, we must disapprove the agency's action.”); *Native Ecosystems Council*, 418 F.3d at 964 (“Given the Forest Service's contradictory calculations and the otherwise opaque nature of the record on the factual basis for the Forest Service's analysis of its compliance with the hiding cover standard, we cannot reasonably determine that the Forest Service has complied with the HNF Plan.”).

The potential cumulative impacts associated with this GE Eucalyptus must be disclosed and analyzed in an EIS. “A cumulative impact is defined as ‘the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency ... or person undertakes such other actions. Individually minor, but collectively significant actions, taking place over time, can generate cumulative impacts.’⁸⁶

Cumulative impacts must be fully considered in an EA. “Given that so many more EAs are prepared than EISs, *adequate consideration of cumulative effects requires that EAs address them fully.*”⁸⁷ NEPA requires agencies to consider the cumulative impacts of their proposed actions.⁸⁸ Specifically, an EA must provide a quantified assessment of project’s environmental impacts when combined with other projects.⁸⁹ The EA cannot simply discuss the direct effect of the project and conclude that there are no cumulative impacts.⁹⁰ Instead, cumulative effects must be evaluated along with the direct and indirect effects of a project and its alternatives. A meaningful cumulative impact analysis, according to the D.C. Circuit, must identify:

(1) the area in which the effects of the proposed project will be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions—past, present, and proposed, and reasonably foreseeable—that have had or are expected to have impacts in the same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate.⁹¹

Because trees are dominant, keystone members of their ecosystems they may have far-ranging impacts. Thousands of species are dependent upon trees for survival. “In evaluating the potential release of genetically engineered organisms, it is crucial to evaluate their impacts on the community and ecosystem. The primary reason for this statement is the fact that genes in individuals and populations have “extended phenotypes”, which are defined as the effects of genes on the community and ecosystem.”⁹²

In the draft EA, APHIS devotes only one paragraph to an analysis of cumulative impacts. (EA at 28). In it, APHIS concludes that there are no cumulative impacts to analyze: APHIS “determined that there are no past, present, or reasonably foreseeable actions that

⁸⁶ *Id.*

⁸⁷ *Kern v. United States Bureau of Land Mgmt.*, 284 F.3d 1062, 1076 (9th Cir. 2002) (“We have held that an EA may be deficient if it fails to include a cumulative impact analysis or to tier to an EIS that has conducted such an analysis.”)

⁸⁸ 40 C.F.R. § 1508.27(b)(7); *Utahns for Better Transp. v. United States Dep’t of Transp.*, 305 F.3d 1152, 1172 (10th Cir. 2002); *Kern v. United States Bureau of Land Mgmt.*, 284 F.3d at 1076; *Vill. Of Grand View v. Skinner*, 947 F.2d 651, 659 (2nd Cir. 1991).

⁸⁹ *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 972 (9th Cir. 2006) (quoting *Klamath-Siskiyou Wildlands Center v. Bureau of Land Management*, 387 F.3d 989, 994 (9th Cir. 2004)).

⁹⁰ *Id.*

⁹¹ *Grand Canyon Trust v. F.A.A.*, 290 F.3d 399, 345 (D.C. Cir. 2002).

⁹² T. Whitham, Summary of the presentation by Thomas G. Whitham at the July, 2003 meetings on “Genetically Engineered Forest and Fruit Trees” sponsored by USDA/APHIS in Riverdale, MD.

would aggregate with the effects of the proposed action to create cumulative impacts....” (EA at 28). This is an exceptionally cursory and inadequate showing. APHIS’ analysis appears to do precisely what the NEPA jurisprudence forbids: fails to provide a quantified assessment of project’s environmental impacts when combined with other projects and instead merely looks at the direct effects of the project and concludes that there are no cumulative impacts.⁹³

The proposed field trials fit a cumulative impacts model well, as potentially individually minor, but collectively significant actions, taking place over time.⁹⁴ APHIS at various places in the EA concludes that the acreage of the field tests are individually small, not more than 20 acres.⁹⁵ But what of the cumulative impacts of all the field testing plantings together – 330 acres, 29 locations, 7 states, 260,000-plus trees? Where is this collective impact assessed? Further, APHIS acknowledges that that it is “reasonably foreseeable” that ArborGen will grow the GE Eucalyptus trees to maturity, past the three year period on these permits (EA at 28); and as a result they will persist in the environment for at least 7-9 years. Besides noting that the trees are supposed to then be removed and destroyed, there is no cumulative assessment of any potential impacts. Is the assessment for the 3 year permit only, or for the reasonably foreseeable 7-9 year permit renewals?

Finally, APHIS acknowledges that ArborGen has already submitted a petition for deregulation of the same GE Eucalyptus trees. Yet, regarding the impacts of future commercial plantations of GE Eucalyptus, APHIS notes that the “environmental effects of that [deregulation] petition will be analyzed in a separate document.” (EA at 28). The declining of assessment of the potential impacts of GE Eucalyptus is the major thread that runs through the EA, regarding many types of impacts: fire, soil hydrology, species impacts, and contamination, to name a few. This decision to post-pone any analysis of broader impacts is unwise, short-sighted, and a violation of NEPA. “NEPA is not designed to postpone analysis of an environmental consequence to the last possible moment. Rather, it is designed to require such analysis *as soon as it can reasonably be done.*”⁹⁶ APHIS is well aware of ArborGen’s pending deregulation petition; no doubt much of the information in that petition would be useful to commenting on these field trials. Is APHIS going to deregulate the GE Eucalyptus before the end of the trials or their renewals? How much of the data from these field trials are necessary to the deregulation determination? None of this is clear and APHIS should have integrated its NEPA process to ameliorate this at the earliest possible time. CEQ regulations require that

⁹³ *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 972 (9th Cir. 2006) (quoting *Klamath-Siskiyou Wildlands Center v. Bureau of Land Management*, 387 F.3d 989, 994 (9th Cir. 2004).

⁹⁴ *Id.*

⁹⁵ *See, e.g.*, EA at 6 n. 2 (noting that 20 acres as defined by forest plantation standards in the southeast is a small planting).

⁹⁶ *Kern v. U.S. Bureau of Land Management*, 284 F.3d 1062 (2002); *Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1246 n. 9 (9th Cir.1984) (‘Reasonable forecasting and speculation is ... implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as ‘crystal ball inquiry,’ ’ quoting *Scientists’ Inst. for Pub. Info., Inc. v. Atomic Energy Comm’n*, 481 F.2d 1079, 1092 (D.C.Cir.1973)).”

Agencies shall integrate the NEPA process with other planning at the earliest possible time to insure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts.⁹⁷

There are certainly going to be conflicts if in the deregulation process APHIS discovers impacts that are not addressed here; we will already have 260,000 trees flowering, potentially contaminating the wild irreversibly and harming ecosystems in a myriad of ways. By postponing any numerous analyses of the impacts of further future planting of these GE Eucalyptus trees on the environment APHIS has failed to comply with NEPA and should prepare an EIS analyzing these impacts.

V. The EA is Deficient and Violative of the APA Because APHIS only Considered Two Alternatives. An EIS is Required.

The EA's Alternatives Section is legally deficient and without further analysis, including more alternatives, will render APHIS's determination arbitrary and capricious. (EA at 14). "NEPA requires that alternatives ... be given full and meaningful consideration, whether the agency prepares an EA or an EIS, the agency must "provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact."⁹⁸ The consideration of alternatives requirement furthers NEPA's goal by guaranteeing that agency decisionmakers "[have] before [them] and take [] into proper account all possible approaches to a particular project (including total abandonment of the project) which would alter the environmental impact and the cost-benefit balance."⁹⁹ NEPA's requirement that alternatives be studied, developed, and described both guides the substance of environmental decisionmaking and provides evidence that the mandated decisionmaking process has actually taken place.¹⁰⁰ Informed and meaningful consideration of alternatives is thus an integral part of the statutory scheme.¹⁰¹

The draft EA only analyzes two alternatives: a no-action alternative and the wholesale issuance of the permits requested. (EA at 14). The permits are for three years, but can and will be renewed further, for the lifetime of the trees (7-9 years).

Agencies cannot define the project so narrowly that it foreclosed a reasonable consideration of alternatives;¹⁰² they "cannot define its purpose and need so as to winnow down the alternatives until only the desired one survives."¹⁰³ "NEPA's

⁹⁷ 40 C.F.R. §1501.2.

⁹⁸ 40 C.F.R. § 1508.9; *Center for Biological Diversity v. National Highway Traffic Safety Admin.* 538 F.3d 1172, 1217 -1218 (9th Cir. 2008).

⁹⁹ *Calvert Cliffs' Coordinating Committee, Inc. v. United States Atomic Energy Commission*, 449 F.2d 1109, 1114 (D.C. Cir. 1971).

¹⁰⁰ *Id.*

¹⁰¹ *See Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228 (9th Cir. 1988).

¹⁰² *Davis*, 302 F.3d at 1119; *Klamath-Siskiyou Wildlands Center v. U.S. Forest Service*, 373 F. Supp. 2d 1069 (E.D. Cal. 2004)

¹⁰³ *Klamath-Siskiyou Wildlands Center v. U.S. Forest Service*, 373 F. Supp. 2d 1069 (E.D. Cal. 2004).

legislative history reflects Congress's concern that agencies might *attempt to avoid any compliance with NEPA by narrowly construing other statutory directives* to create a conflict with NEPA. Section 102(2) of NEPA therefore requires government agencies to comply 'to the fullest extent possible.'¹⁰⁴ At least one alternative that would have examined permitting a more limited field tests -- rather than this unprecedented seven state, 29 location, 260,000 tree, 9 year experiment in nature -- should have been included.

The range of options for APHIS here is broad and the approval of these permits is not an all or nothing question. There is no rational basis (or explanation given) for APHIS conclusion in the EA that only two alternatives be assessed. APHIS acknowledges that the field tests requested would experiment in a "wide variety of environments." (EA at 6). It is reasonable that some of these varied environments would create more risk of harm than others, and/or different types of potential harm. It is difficult to tell which particular sites this might be since their exact locations are confidential business information (CBI) and APHIS does not analyze a middle alternative. However many of the counties of the proposed locations are very close to protected lands. *See supra*. Moreover, APHIS failed to examine an alternative that would allow for only some but not all of the locations to be planted, or allow flowering, for example. APHIS failed to examine an alternative that would allow for a more limited duration of growth, limited flowering, or another assessment and further notice and comment before any renewal of the permits was allowed. APHIS failed to examine an alternative that would exclude Florida, where we know there is already an invasive, escaped Eucalyptus which is a parent of the GE hybrid proposed here. *See supra*.

In order to comply with NEPA, APHIS must "[r]igorously explore and objectively evaluate all reasonable alternatives."¹⁰⁵ APHIS's determination it must only analyze two alternatives, no-action and complete deregulation, that there are no other "reasonable alternatives," is arbitrary and capricious.¹⁰⁶

VI. The EA is Deficient Because it Fails to Adequately Analyze Potential Significant Human Health Impacts. An EIS is required.

Public health issues may be significant environmental impacts requiring the preparation of an EIS. The CEQ regulations explain what factors may be significant effects on the human environment and one such factor is "[t]he degree to which the proposed action affects public health or safety."¹⁰⁷ The presence of one or more of the factors in 40 C.F.R. § 1508.27 may be sufficient to require the preparation of an EIS.¹⁰⁸ Accordingly, APHIS's EA must address any potential human health or safety risks and determine

¹⁰⁴ *Center for Biological Diversity v. National Highway Traffic Safety Admin*, 538 F.3d 1172, 1213 - 1214 (9th Cir. 2008).

¹⁰⁵ 40 C.F.R. § 1502.14(a).

¹⁰⁶ *See, e.g., Curry v. U.S. Forest Service*, 988 F. Supp. 541, 553-554 (W.D. Pa. 1997) (failure of the Forest Service to consider more than two alternatives in connection to forest project was arbitrary and capricious).

¹⁰⁷ 40 C.F.R. § 1508.27(b)(2).

¹⁰⁸ *National Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 731 (9th Cir. 2001); *Public Service Co. of Colorado v. Andrus*, 825 F.Supp. 1483, 1495 (D. Idaho 1993).

whether those human health and safety impacts may be significant. If those impacts are to be found not to be significant, there must be a convincing statement of reasons.¹⁰⁹

Unlike the earlier 2007 EA, APHIS notes the risk of the field tests being a source of *Cryptococcus neoformans gatti*, the fungal pathogen found on a number of Eucalyptus commercial plantations (EA at 27). APHIS concludes any risk of such harm from field testing the transgenic Eucalyptus would be “negligible” because in the main there was no association between its parents and the pathogen and APHIS had “no reason to believe that the genetic modification of the hybrids will alter the association” (Id.) This assumption from a lack of analysis and data does not comply with NEPA’s “hard look” requirement. APHIS must actually assess whether the novel genetic engineering of these trees may impact public health, not assume they will not based on having “no reason to believe” otherwise. APHIS must conduct a thorough investigation in view of the pathogenic characteristics of *Cryptococcus gattii* and observed abilities for spores to be transported through the environment via multiple pathways.

Finally, APHIS again relies on the size of the field trial, calling it “miniscule.” (EA at 27). 260,000 trees is not miniscule. Further, as noted in other contexts of APHIS’ analysis, to comply with NEPA APHIS must assess all reasonably foreseeable impacts, including cumulative impacts of present *and future* related actions at the earliest possible time. In the EIS, APHIS should look at the impacts of potential commercial plantations on the spread of the fungal pathogen and other public health risks, not just the field tests. Monocultures facilitate emergence of pathogens and that a pathogen that can affect other mammalian species as well as humans is of particular concern.

Here there is no meaningful analysis by the agency of potential human health impacts or a convincing statement of reasons” why such impacts may not be significant. APHIS has not complied with NEPA and an EIS is required.

VII. APHIS Failed to Adequately Assess Impacts on Wildlife, Including Impacts on Endangered and Threatened Species and Their Habitat. An EIS and Consultation under ESA §7 and a Biological Opinion is Required.

APHIS did not comply with the Endangered Species Act (ESA), failing to adequately consider effects on threatened or endangered species, or their forest or aquatic habitat. The ESA requires APHIS to consult with FWS and/or NMFS to determine “whether any species which is listed or proposed to be listed [as an endangered species or a threatened species] may be present in the area of such proposed action.”¹¹⁰ Then if APHIS learns from FWS and/or NMFS that threatened or endangered species may be present, a biological assessment must be prepared to identify any endangered species or threatened species which are likely to be affected by such action.¹¹¹ The initial request for

¹⁰⁹ *National Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 731 (9th Cir. 2001).

¹¹⁰ 16 U.S.C. § 1536(c)(1); 50 C.F.R. § 402.12(c) (requiring federal agencies to request information regarding listed species and critical habitat from the Department of the Interior).

¹¹¹ *Id.*

information from FWS and/or NMFS is a predicate to further agency action and cannot be ignored.¹¹²

Accordingly, APHIS must demonstrate that at the very least, it has consulted with the United States Fish and Wildlife Service (“FWS”) and/or the National Marine Fisheries Service (“NMFS”) and taken the first step in considering the impacts of an APHIS approval of the GE Eucalyptus field tests on threatened or endangered species. APHIS has already once been previously found to have violated the ESA when it skipped this initial, mandatory step of obtaining information about listed species and critical habitats from FWS and/or NMFS.¹¹³ The court emphasized that regardless of whether there is any evidence that species or habitat may be harmed in any way, “an agency violates the ESA when it fails to follow the procedures mandated by Congress, and an agency will not escape scrutiny based on the fortunate outcome that no listed plant, animal, or habitat was harmed.”¹¹⁴

Here APHIS applied an assessment of its own instead of consulting the expert agencies. There are a number of concerns, including harm from heavy Eucalyptus water use on water-dependent or aquatic systems; or harm to forest dwelling protected species from harm to their forest ecosystems from fire, water use, or transgenic tree establishment. Many of these impacts APHIS declined to address in the NEPA context even though this is a de facto deregulation and it is reasonably foreseeable that deregulation will lead to further plantings and commercial plantations. *See* cumulative impacts section *supra*.

The EA states “APHIS has reached a determination that the proposed environmental release will have *no effect* on federally listed threatened or endangered species or species proposed for listing, and no effect on designated critical habitat or habitat proposed for designation in the action area.” (EA at 32). APHIS bases its unilateral conclusion on Appendix II. However, the inadequacy of the EA in assessing potential contamination, invasiveness, watershed impacts and fire risks have also concomitantly resulted in a fully inadequate assessment of potential impacts on endangered or threatened species and protected habitat. It is also difficult for adequate review of potential impacts to protected species to occur given that the locations of the experimental plantings are withheld. *See* *infra* Section IV. Furthermore, the enormous number of potentially impacts protected species listed in Appendix II, in the affected counties, belies APHIS’ conclusion that consultation is not required. A Federal agency is required to consult with the expert agencies if an action “may affect” listed species or designated critical habitat. Because the proposed field tests at the very least “may effect” protected species, APHIS’ decision not to informally or formally consult FWS is arbitrary and capricious and contrary to law. APHIS should have requested a formal Biological Opinion from FWS on the proposed field tests.

While APHIS asserted that there would be no effect on endangered species such as the Red Cockaded Woodpecker and others because the birds were not expected to nest in the

¹¹² *Thomas v. Peterson*, 753 F.2d 754, 764 (9th Cir. 1985).

¹¹³ *Center for Food Safety v. Johanns*, 451 F.Supp.2d 1165, 1182 (D. Hawaii 2006).

¹¹⁴ *Id.*

test sites, APHIS admitted that the species could “visit the field test site” (EA at 42). This is enough to trigger the ESA standard. The EA concludes that there would be no impact on birds because they “would not be expected to inhabit these sorts of field tests”. (EA at 33). But birds don’t need to “inhabit” the test sites to be affected or harmed by the experimental plantings. Eucalyptus trees produce a “sticky gum” which can clog a bird’s faces, bills and snares, and eventually suffocate the bird or cause it to starve. Native birds in Australia have evolved to overcome this problem, while non-native species in the US have not.¹¹⁵ Consequently, if these birds visit the test sites, they could be exposed to the deadly sticky gum. The EA contained no analysis of the sticky gum’s impacts on species.

Some of the protected bird species in the states of the proposed experimental field trials include:

1. Caracara, Audubon's crested *Polyborus plancus audubonii* (T): Florida
2. Crane, Mississippi sandhill *Grus canadensis pulla* (E): Mississippi
3. Crane, whooping (*Grus americana*) (E): Texas
4. Curlew, Eskimo (*Numenius borealis*) (E): Texas
5. Falcon, northern aplomado (*Falco femoralis septentrionalis*) (E): Texas
6. Flycatcher, southwestern willow (*Empidonax traillii extimus*) (E): Texas
7. Kite, Everglade snail *Rostrhamus sociabilis plumbeus* (E): Florida
8. Owl, Mexican spotted (*Strix occidentalis lucida*) (T): Texas
9. Pelican, brown: listed as endangered except U.S. Atlantic coast, FL, AL (*Pelecanus occidentalis*) (E): Texas
10. Plover, piping: listed as threatened except Great Lakes watershed (*Charadrius melodus*) (T): Texas
11. Prairie-chicken, Attwater's greater (*Tympanuchus cupido attwateri*) (E): Texas
12. scrub-jay, Florida *Aphelocoma coerulescens* (T): Florida
13. Sparrow, Cape Sable seaside *Ammodramus maritimus mirabilis* (E): Florida
14. Sparrow, Florida grasshopper *Ammodramus savannarum floridanus* (E): Florida
15. Stork, wood *Mycteria americana* (E): Alabama, Florida, Georgia, South Carolina, Texas
16. Tern, least interior pop. (*Sterna antillarum*) (E): Texas
17. Vireo, black-capped (*Vireo atricapilla*) (E): Texas
18. Warbler (=wood), Bachman's *Vermivora bachmanii* (E): South Carolina
19. Warbler (=wood), golden-cheeked (*Dendroica chrysoparia*) (E): Texas
20. Woodpecker, ivory-billed *Campephilus principalis* (E): Arkansas
21. Woodpecker, red-cockaded *Picoides borealis* (E): Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, South Carolina, Texas¹¹⁶

¹¹⁵ Williams, Ted, “America’s Largest Weed,” *Audubon Magazine*, January 2002.

¹¹⁶ Species ad hoc search,
http://ecos.fws.gov/tess_public/SpeciesReport.do?groups=B&listingType=L&mapstatus=1 ;
 Listings and occurrences for Texas,
http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=TX

The barnase gene which has been engineered to alter the fertility of the trees has been labeled a “terminator gene” because it destroys plant cells and has been used in the instant application to ablate the fertility cells of the Eucalyptus hybrid. When used, the barnase gene remains present in the cells and tissues of the plant in which it was introduced. Barnase has been found through experiments, even in trace amounts, to be toxic to rat kidneys and human cell lines.¹¹⁷ Many insects including bees will eat the pollen and its impacts on wildlife were not assessed. Insects have extremely important roles in ecosystems.

APHIS instead relies wholly on previous studies by the FDA of the use of barnase in food crops to evaluate its safety. (EA at 18). FDA did not evaluate the use of barnase in the current host, GE Eucalyptus. Further and more critically, with regard to FDA’s “analysis” from its voluntary consultation process, APHIS cannot solely rely on another agency’s evaluation of environmental effects under a separate statute to adequately fulfill its own NEPA obligations.¹¹⁸ APHIS has its own duty to comply with NEPA, including assessment of potential significant impacts to health and wildlife from the barnase gene. There is a further reason APHIS must not merely defer in toto to FDA: FDA’s voluntary consultation process is extraordinarily weak. It is based on a statement of policy, not a binding regulation.¹¹⁹ GE crop developers may choose to consult with FDA, but this process is vitiated by its voluntary nature and a lack of any established testing standards; in particular, GE crop developers seldom if ever conduct animal feeding trials with GE crops for the purpose of detecting potential toxicity.

The EA’s section on Terrestrial animals is similarly inadequate and conclusory. (EA at 26). The EA concludes that the transgenes do not have any known toxins (which itself is a suspect conclusion, given the unknowns with the genes in this experimental planting), but does not address the fact that Eucalyptus produces natural toxins. Invasive Eucalyptus in California have been faulted for the decline of some insects and songbirds.

The EA’s section on Aquatic animals is similarly cursory and inadequate and does not analyze impacts from water quantity and quality impacts from the experimental plantings (EA at 26).

Finally, APHIS did not assess potential impacts to protected species critical habitat. Some of these protected areas near the proposed tests include

Baldwin, AL:

- Mouse, Perdido Key beach (*Peromyscus polionotus trissyllepsis*)
- Plover, piping (*charandrius melodus*)

¹¹⁷ See Ilinskaya O and Vamvakas S., “Nephrotic Effect of Bacterial Ribonucleases in the Isolated and Perfused Rat Kidney,” *Toxicology*, 120, 55-63 (1997); Prior T, Kunwar S and Pastan I., “Studies on the Activity of Barnase Toxins In Vitro and In Vivo,” *Biocong Chem* 1996, 7, 23-9.

¹¹⁸ *Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1248 (9th Cir. 1983); *Oregon Envtl. Council v. Kunzman*, 714 F.2d 901, 905 (9th Cir. 1983).

¹¹⁹ *Alliance for Bio-Integrity v. Shalala*, 116 F.Supp.2d 166 (D.D.C.2000).

Charleston, SC:

- Plover, piping (*charandrius melodus*)

Gadsden, FL:

- Sturgeon, gulf (*Acipenser oxyrinchus destoi*)

Marion, FL:

- Manatee, West Indian (*Trichechus manatus*)

Taylor, FL:

- Plover, piping (*charandrius melodus*)¹²⁰

VIII. APHIS Failed to Comply with the Mandates of the 2008 Farm Bill.

Additionally, review of APHIS's field trial permitting and oversight has been found to be deficient in a numbers of respects. In 2005, the USDA's Office of the Inspector General (OIG) conducted an audit covering GE crop field trials conducted in 2002 and 2003, finding numerous basic deficiencies in APHIS oversight.¹²¹ A few of the more flagrant deficiencies are noted below:

1. In most cases, APHIS does not know where or even if many field tests have been planted. In 85% of the permits and 100% of notification field trials that OIG reviewed, only the company's business address, or the state and county of the field trial, was listed as the planting location.
2. APHIS does not require submission of written protocols, and thus does not review them, prior to issuing a notification permit. OIG notes that an APHIS report completed in 2001 concluded that some notification protocols might not be adequate to meet its field test performance standards and identified several major areas in need of improvement.
3. "APHIS did not maintain a list of planted GE fields." This recalls a similar deficiency in tracking permit information noted by a previous OIG report in 1994, suggesting that APHIS has not corrected this fundamental defect since that time, nearly a decade ago.¹²²
4. APHIS failed to conduct scheduled inspections of numerous field trials of both pharmaceutical-producing crops and other experimental GE crops grown under notification. Only 1 of 12 sites inspected by OIG in 2003 had all 5 required

¹²⁰ U.S. FWS Critical Habitat Portal, <http://criticalhabitat.fws.gov/>

¹²¹ OIG (2005). "Audit report: Animal and Plant Health Inspection Service controls over issuance of genetically engineered organism release permits," Audit 50601-8-Te, USDA, Office of Inspector General, Southwest Region, December 2005.

¹²² Audit Report 33099-9-Hy, dated August 1994, USDA Inspector General.

inspections; only 18 of the 55 required inspections were performed for the other 11 sites.

5. In two cases, the OIG inspectors discovered that a total of 2 tons of harvested pharma crops had been stored onsite for over 1 year, without APHIS' knowledge, and thus without APHIS inspection of the storage facility, one of many "requirements" of pharmaceutical crop field trial permits.

Furthermore, most of the 16 contamination episodes of which we have knowledge have occurred in the U.S. and involved GE crops grown under notification field trials.¹²³ Several of these have involved considerable economic damage to U.S. farmers, food companies, as well as the crop developers themselves. Many more contamination episodes have likely occurred, but have either gone undetected or unreported.

In the draft EA, APHIS proposes to permit the field trials with only three minimal conditions: the testing sites will be monitored for flowering and data will be provided annually to APHIS; the sites will be monitored for volunteers with information again provided annually to APHIS; and that all plant material from the field site will be treated as regulated articles. (EA at 15).

With the adoption of the 2008 Farm Bill, Congress mandated that APHIS "improve the management and oversight" of GE field trials (§ 10204), implement measures outlined in the agency's "Lessons Learned" document prepared in the wake of the 2006 'Liberty Link' rice contamination debacle, and adopt a series of other new measures to mitigate transgenic contamination.¹²⁴ The proposed permit and draft EA fail to comply with many of the Farm Bill mandates. Failing to comply with Farm Bill Section 10204 in this field test approval would be arbitrary, capricious, an abuse of discretion, and not in accordance with the law.¹²⁵

a. Availability of Representative Samples

In the rice investigation, the effort to test for biological contamination was hampered by the unavailability of representative seed samples. Thus, USDA suggested "Revising 7 CFR 340 to require that representative samples of events introduced must be retained by

¹²³ Contamination Episodes with Genetically Engineered Crops," Center for Food Safety, August 2006, available at <http://www.centerforfoodsafety.org/pubs/Contamination%20episodes%20fact%20sheet.pdf>.

¹²⁴ Farm Bill Section 10204(a)(1) requires APHIS "to take action on each issue identified in the document entitled 'Lessons Learned and Revisions under Consideration for APHIS' Biotechnology Framework,' dated October 4, 2007. "Lessons Learned" was prepared in the wake of the 2006 'Liberty Link' rice contamination incident, and suggests new measures that APHIS should include in its regulations to avoid the pitfalls it discovered during the rice investigation. USDA, "Lessons Learned and Revisions under Consideration for APHIS' Biotechnology Framework," (Hereinafter "Lessons Learned") available at <http://www.aphis.usda.gov/newsroom/content/2007/10/content/printable/LessonsLearned10-2007.pdf>. Farm Bill Section 10204(b) requires the Secretary to take nine actions to make the improvements suggested in 'Lessons Learned.' Farm Bill Section 10204(c) requires the Secretary to consider ten additional improvements.

¹²⁵ 5 U.S.C. § 706.

permit and notification holders for a designated period of time.”¹²⁶ Farm Bill Section 10204(b)(2) requires inclusion of “representative samples.” Farm Bill Section 10204(c)(1)(B) requires the Secretary to consider establishing a means to identify regulated articles (including retention of seed samples). The permit requirements here do not contain such an improvement and therefore violate the plain meaning of Farm Bill Section 10204. APHIS must revise the proposed permit requirements to include retention representative samples of all field tested GE crops.

b. Contingency Plan

In its rice investigation, APHIS found that researchers and developers were unclear about their responsibilities in the event of unauthorized releases. Thus, USDA suggested, “requiring that the applicant submit a contingency plan with their permit application that addresses the unauthorized release of regulated articles to include dispersal, commingling, and persistence due to climate, animal incursion, or human error.”¹²⁷ APHIS must amend the proposed permit conditions to include the specifics outlined in “Lessons Learned,” namely that such a plan address dispersal, commingling, and persistence due to climate, animal incursion, or human error.

c. Gene-Specific Testing Procedures; Molecular Forensics

Due to difficulties in determining proper testing procedures during the rice investigation, USDA stated that APHIS should consider “whether permit holders . . . have gene-specific testing procedures needed to identify regulated articles in the event of an unauthorized release.”¹²⁸ USDA also stated that it must “assure that the sampling and testing of all physical seed samples meet scientifically sound sampling and testing protocols.”¹²⁹ Furthermore, Farm Bill Section 10204(b)(5) requires inclusion of “protocols for conducting molecular forensics.” The permit conditions do not contain any gene-specific testing protocols for any requirements whatsoever concerning molecular forensics. Thus, APHIS must revise the proposed permit to include the legal mandate for gene-specific testing.

d. Corrective Action Plan

In past unauthorized release events, APHIS claims it was delayed in responding because it did not have the technical expertise that researchers and developers possess. Thus, USDA explored revising 7 CFR 340, “requiring applicants to submit a comprehensive action plan for any incident in which viable regulated articles could persist in the environment or in the seed, food, or feed supply following an incident.”¹³⁰ Farm Bill Section 10204(b)(4) requires the Secretary to take actions to enhance “corrective actions in the event of an unauthorized release.” APHIS must revise the proposed permits to

¹²⁶ Lessons Learned at 2.

¹²⁷ *Id.*

¹²⁸ Lessons Learned at 2.

¹²⁹ *Id.* at 3.

¹³⁰ Lessons Learned at 2.

include this mandate.

e. Contractual Relationships

USDA acknowledged that APHIS investigations have been hindered by incomplete access to agreements made between researchers/developers and other parties. Thus, APHIS has explored “revisions to 7 CFR 340 to require certain business agreements made among GE technology researchers or developers and other parties regarding regulated articles to be in writing,” with provisions including “duration of the agreement, ownership of regulated materials, genetic events involved, and other items that may be deemed critical as BRS revises this regulation.”¹³¹ Additionally, Farm Bill Section 10204(b)(6) requires the Secretary to take actions that enhance “clarity in contractual agreements.” The proposed permit fails to include these requirements, thus APHIS must remedy this deficiency.

f. Isolation Distances

During recent investigations, APHIS continues to confront the critical issue of isolation distances between experimental crops and nearby field crops to prevent biological contamination. USDA stated that it is “essential to incorporate the latest scientific information into APHIS’ regulatory requirements to maximize confinement of regulated articles.”¹³² Farm Bill Section 10204(b)(7) requires the Secretary to take actions that enhance “the use of the latest scientific techniques for isolation and confinement distances.” Farm Bill Section 10204(c)(1)(C) requires the Secretary to consider establishing “standards for isolation and containment distances.” The proposed permit fails to include any such requirements. Isolations distances that incorporate the latest available science are critical to the process of protecting from contamination. Requiring such measures based on available science will also be one step further toward a regulatory structure based on “sound science,” as required by the PPA.¹³³

IX. APHIS Approval of the Field Trials is Arbitrary and Capricious Because APHIS Violated the APA By Failing to Disclose the Location of the Field Test Sites and One of the Transgenes, Vitiating the Public’s Ability to Meaningfully Comment. APHIS Also Violated the APA’s Notice and Comment Procedures.

Failure to Disclose Test Site Locations and Classify Altered Lignin Gene Construct

By classifying the altered lignin biosynthesis gene and the location of the field test sites “confidential business information” and failing to disclose the information in a draft EA, APHIS has violated public notice and comments requirements of the APA and NEPA. The APA requires public notice of an agency’s proposed rule including “the terms or substance of the proposed rule or a description of the subjects and issues involved” to be

¹³¹ Lessons Learned at 3.

¹³² *Id.*

¹³³ 7 U.S.C. 7701(4).

published in the Federal Register at least thirty days before its effective date.¹³⁴ The purpose behind NEPA is to “insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken.”¹³⁵ NEPA requires meaningful public participation as a check on proposed agency actions.¹³⁶

Nondisclosure of key information in an agency’s notice of proposed rulemaking violates the APA and NEPA notice and comment requirements when it critically impairs public comment on the essential substance of a proposal. The undisclosed location of the test sites and knowledge of the gene being manipulated to alter the lignin content are not only relevant, but essential to the substance of the agency’s proposal itself. Shielding of the altered lignin biosynthesis gene means a fundamental element of the agency’s regulatory responsibility remains shrouded in secrecy. “Accurate scientific analysis, expert agency comments, and *public scrutiny* are essential to implementing NEPA.”¹³⁷ Lignin has many functions in plants, so knowing the gene product is important for predicting other effects. It also appears that two different genes will be used to confer cold tolerance (EA at 6, 17), but the EA fails to disclose if the genes will be present together or separately in the field tests. The types of genes involved could facilitate biological contamination through gene flow and the spread of these transgenic trees into the environment. Likewise, the precise location of the field trials could increase the risk of spread to protected lands. The public and scientific community cannot make fully informed comments about a proposal to test the GE Eucalyptus when critical information such as gene names is withheld.

The EA notes that “the exact locations [of the field tests] are claimed as CBI.” (EA at 6). Similarly, nondisclosure of the locations of the field trials renders informed comment about the potential effects of the field testing—including *inter alia* crucial site-specific effects analyzes on fire danger, water table reduction, endangered species impact, contamination risk, potential harm to protected areas nearby and human health concern—impossible.

As discussed above, to determine whether the significance of a proposed action necessitates the preparation of an EIS, the Council on Environmental Quality (CEQ) through NEPA promulgated regulations requiring agencies to consider both the context and intensity of an action.¹³⁸ Assessing the context of a proposed action

¹³⁴ 5 U.S.C.A. § 552(c) (2009).

¹³⁵ 40 C.F.R. § 1500.1(b),(c).

¹³⁶ See 42 U.S.C. §4321 (2009); 40 C.F.R §1500.2 (2009) (“Federal agencies shall to the fullest extent possible... encourage and facilitate public involvement in decisions which affect the quality of the human environment.”); 40 C.F.R. §1501.4(b) (2009) (“The agency shall involve...the public, to the extent practicable, in preparing [EAs]”); 40 C.F.R. §1506.6 (2009) (“Agencies shall ... [m]ake diligent efforts to involve the public in preparing and implementing their NEPA procedures[,] ... [p]rovide public notice of ... the availability of environmental documents so as to inform those persons ... who may be interested or affected[,] [and] ... [s]olicit appropriate information from the public.”); *Citizens for Better Forestry v. U.S. Dep’t of Agriculture*, 341 F.3d 961, 970 (9th Cir. 2003).

¹³⁷ 40 C.F.R. § 1500.1(b).

¹³⁸ 40 C.F.R. §1508.27 (2009).

means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole.¹³⁹

Furthermore, to assess the intensity of action agency officials must consider, among other things, the “[u]nique characteristics of the geographic land area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas” as well as “the degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources.”¹⁴⁰ In this case, APHIS has failed to allow for meaningful public comment on the significance of the action in terms of both context and intensity because it has failed to disclose the locations of the proposed test sites necessary for make site-specific determinations.

As one of his first presidential acts President Obama issued a *Memorandum for the Heads of Executive Departments and Agencies* emphasizing agency disclosure as a precept of transparent, democratic government. The Executive memorandum dated January 21, 2009 states:

All agencies should adopt a presumption in favor of disclosure, in order to renew their commitment to the principles embodied in FOIA, and to usher in a new era of open Government...The presumption of disclosure also means that agencies should take affirmative steps to make information public. They should not wait for specific requests from the public.¹⁴¹

Given the new presumption in favor of disclosure, APHIS should complete an EIS that publicly discloses and analyzes the precise locations of the field test sites and the nature of the altered lignin biosynthesis gene in order to satisfy the public notice and comment requirements and policy objectives of the APA and NEPA.

Failure to Abide By APA’s Notice and Comment Procedures

APHIS has violated the APA by failing to comply with the notice and comment requirements of the Administrative Procedure Act (APA). The APA generally requires an agency to publish “notice of proposed rulemaking...in the Federal Register...not less than 30 days before its effective date.”¹⁴² The statute also requires that an agency to “give interested persons an opportunity to participate in the rulemaking through the submission

¹³⁹ 40 C.F.R. §1508.27(a) (2009).

¹⁴⁰ 40 C.F.R. §1508.27(b) (2009).

¹⁴¹ Exec. Memorandum for the Heads of Executive Departments and Agencies, 74 Fed. Reg. 4,683 (Jan. 21, 2009).

¹⁴² 5 U.S.C.A. § 552(b)-(d)

of written data, views, or arguments.”¹⁴³ Courts have interpreted the APA’s public participation provision as a requirement for an agency to hold a 30-day public comment period upon notice of a proposed rulemaking decision.¹⁴⁴ Integral to the notice-and-comment requirement of the APA “is the agency’s duty ‘to identify and make available technical studies and data that it has employed in reaching the decisions to propose particular rules.... An agency commits serious procedural error when it fails to reveal portions of the technical basis for a proposed rule in time to allow for meaningful commentary.’”¹⁴⁵

APHIS has violated the APA by failing to provide “technical studies and data” or “sufficient factual detail and rationale” underlying its proposed rulemaking. Specifically, APHIS has failed to make any of ArborGen’s permit applications for the field testing of genetically engineered eucalyptus open to the public. In its draft EA, APHIS recommends issuing permits “to allow the research to proceed at the field test sites...with supplemental permit conditions based on APHIS scientific analysis of the permit application...”¹⁴⁶ APHIS, however, has not made public ArborGen’s permit application, which the agency admitted relied on for scientific analysis in formulating supplemental conditions for its preferred alternative. Nor has APHIS disclosed any of the permits previously issued to ArborGen or any of ArborGen’s previous applications for the field testing of genetically engineered eucalyptus. This information is essential to APHIS’ proposed rulemaking regarding the permitting of GE eucalyptus for extensive field testing. Moreover, because APHIS established July 6, 2009 as the end of the comment period but the agency’s link to submit comments to the docket was unavailable until June 10, 2009, the agency has provided an insufficient opportunity to comment.

Furthermore, beyond providing an insufficient comment period and failing to make public critical information upon which the agency relied in issuing its notice of proposed rulemaking, APHIS has repeatedly violated the APA by failing to provide notice and comment opportunity for vast field test expansions. The APA requires notice and opportunity to comment before promulgating a new rule, adopting a new position inconsistent with an existing regulation, or effecting a substantive change in an existing regulation.¹⁴⁷ After initially permitting the field testing of GE eucalyptus on a 1.1-acre site following the completion of an EA and fulfillment of notice and comment requirements, APHIS “subsequently amended” its permits to allow field testing of an area

¹⁴³ 5 U.S.C.A. § 552(c).

¹⁴⁴ See *Kelly v. U.S. Dept. of Interior*, 339 F.Supp.1095, 1102 (D.C. Cal. 1972) (“the 30-day comment period should be closely guarded”); *U.S. v. Torres*, 573 F.Supp. 2d 925 (W.D. Tex. 2008) (“The Administrative Procedure Act requires that ‘[g]eneral notice of proposed rulemaking shall be published in the Federal Register’ ‘not less than 30 days before [the] effective date [of a substantive rule]’ that allows ‘interested persons an opportunity to participate in the rule making[.]’ [5 U.S.C. § 553\(b\)-\(d\)](#).”).

¹⁴⁵ *Solite Corp. v. EPA*, 952 F.2d 473, 484 (D.C.Cir.1991) (quoting *Connecticut Light & Power Co. v. NRC*, 673 F.2d 525, 530-31 (D.C.Cir.1982)); See also *Honeywell Int’l, Inc. v. EPA*, 372 F.3d 441, 445 (D.C.Cir. 2004) (quoting *Fla. Power & Light Co. v. United States*, 846 F.2d 765, 771 (D.C.Cir. 1988) (“Under the Administrative Procedure Act, a notice of proposed rulemaking must ‘provide sufficient factual detail and rationale for the rule to permit interested parties to comment meaningfully.’”).

¹⁴⁶ Field Testing of Genetically Engineered *Eucalyptus Grandis* X *Eucalyptus Urophylla*: Draft Environmental Assessment 34 (May 8, 2009); 74 Fed. Reg. 26,648 (June 3, 2009).

¹⁴⁷ See *Parkdale Int’l, Ltd. v. United States*, 508 F.Supp.2d 1338 (C.I.T. 2007).

more than quadruple the size of the original 1.1-acre site without notice or comment period.¹⁴⁸ Following that, again without adherence to APA notice and comment requirements, APHIS granted ArborGen an additional permit, #08-151-101r, to allow the flowering of GE eucalyptus at different site in another state. Yet AHPIS's latest EA states that 57 acres have been planted with GE eucalyptus upon which 7.6 acres are permitted to flower.¹⁴⁹ Neither APHIS's EA nor any other public documents provide an explanation for why 57 acres of GE eucalyptus are currently planted when the public has only had an opportunity to comment on 1.1-acre permitting proposal. This permitting and expansion occurred in spite of an acknowledged history of ArborGen noncompliance, in which the company failed "to maintain the identity of trees of a genetic construct introduced in field trials" and failed "to follow procedural requirements for notifying APHIS of identification of a regulated article in the notification" in violation of 7 CFR 340.3(c)(3) and 340.3(d)(2)(ii)(b).¹⁵⁰ The exponential growth of the permitted field test from 1.1 to 57 acres in spite of a history of company noncompliance constitutes a clear violation of the APA.

Not only did APHIS vastly expand the field trials without notice or opportunity for public comment, but APHIS also permitted an entirely novel GE gene construct without notice or comment. According to the APHIS's website, the agency issued a permit for testing of a lignin biosynthesis gene in eucalyptus in 2007.¹⁵¹ However, APHIS's previous EA and FONSI for the field release of GE eucalyptus proposed testing four novel GE gene constructs—one gene used as a selectable marker gene, one gene intended to reduce flower development, and two genes intended to confer cold tolerance—none of which included a gene altered to inhibit lignin biosynthesis.¹⁵² The current draft EA for the field testing of GE eucalyptus, the only other EA for the release of GE eucalyptus that has been made public, states that the lignin biosynthesis gene "has been previously tested in ArborGen field trials for more than two years."¹⁵³ Without more information, the only rationale explanation for how the altered lignin biosynthesis gene could have been tested "for more than two years" is that APHIS here again failed to adhere to APA requirements by permitting the release of a novel GE gene construct without public notice or comment.

Submitted on July 6, 2009

Submitted by,

¹⁴⁸ Field Testing of Genetically Engineered Eucalyptus Grandis X Eucalyptus Urophylla: Draft Environmental Assessment 4 (May 8, 2009); 74 Fed. Reg. 26,648 (June 3, 2009).

¹⁴⁹ *Id.*

¹⁵⁰ USDA-APHIS-Biotechnology, http://www.aphis.usda.gov/biotechnology/compliance_history.shtml

¹⁵¹ Application Recently Submitted for ArborGen: Release Permits,

http://www.aphis.usda.gov/brs/status/cata_ins_arborgen_0051.html

¹⁵² USDA/APHIS Environmental Assessment in Response to Permit Application (06-325-111r) Received from ArborGen LLC for a Field-Test of Genetically Engineered *Eucalyptus Grandis X Eucalyptus Urophylla*, 7 (June 27, 2007); 72 Fed. Reg. 35,215 (June 27, 2007).

¹⁵³ Field Testing of Genetically Engineered *Eucalyptus Grandis X Eucalyptus Urophylla*: Draft Environmental Assessment, *supra* at 19.

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