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BORDEN, J., concurring and dissenting. I agree with part I of the majority opinion to the extent that it concludes that ''an inland wetlands agency may regulate activities outside of wetlands, watercourses and upland review areas only if those activities are likely to affect adversely the physical characteristics of those wetlands or watercourses and not just the wildlife that uses the wetlands.'' I disagree, however, with part II of the majority opinion, which concludes that the trial court improperly applied the substantial evidence test. I conclude, to the contrary, that the denial of the permit sought by the plaintiffs, River Bend Associates, Inc., and Griffin Land and Nurseries, Inc., was supported by substantial evidence in the record. I therefore dissent, and would affirm the trial court's judgment dismissing the plaintiffs' appeal.[1]

Because I agree with the analysis in part I of the majority opinion, I confine my remarks to part II, namely, the application of the substantial evidence test. It is axiomatic that, if any one reason given by the defendant conservation and inland wetlands commission of the town of Simsbury (commission) is supported by substantial evidence, the commission's denial of the plaintiffs' application must stand. *Tarullo* v. *Inland Wetlands & Watercourses*, 263 Conn. 572, 584, 821 A.2d 734 (2003). It is also axiomatic that ''an applicant for an inland wetlands permit has the burden of proving that it has met the statutory prerequisites for a permit.'' *Samperi* v. *Inland Wetlands Agency*, 226 Conn. 579, 593, 628 A.2d 1286 (1993). Furthermore, we have stated that, in reviewing the decisions of local inland wetlands agencies, courts ''must be scrupulous not to hamper the legitimate activities of [such agencies] by indulging in a microscopic search for technical infirmities in their actions. . . . This cautionary advice is especially apt whenever the court is reviewing a decision of a local commission composed of laypersons.''[2] (Citation omitted; internal quotation marks omitted.) Id., 596. Gauged by these standards, I would conclude that the commission's denial of the permit was supported by substantial evidence in at least one respect, namely, that the plaintiffs did not sustain their burden of proof with regard to their proposed soil mixing plan.[3]

The commission made the following voluminous factual findings that related to the plaintiffs' soil mixing plan, all of which my review of the record indicates were supported by substantial evidence. These findings and their accompanying analyses by the commission take up approximately six single-spaced pages of the commission's decision. In addition, as I read the record, all of these findings are either *not* contested by the

plaintiffs on appeal or are based on evidence in the record that the commission was entitled to credit. Furthermore, all of these findings are unconnected to wildlife habitat.

The commission found that the ecology of the wetlands and watercourses has been depressed by the physical and chemical impacts of farming practices that the plaintiffs and property owners have allowed on the property. This includes the fact that tobacco farming on the property continues to impact wetlands 2 and 5, and the property's irrigation ponds, namely, wetlands 3 and 9, by exporting silt and sediment. Soil at the site is contaminated extensively with as many as forty-four different organochlorine pesticides in addition to an unknown number of fungicides. The six pesticides that reach levels determined by the department of environmental protection to present a hazard to human health and the proper functioning of the environment include chlordane, dieldrin and heptachlor epoxide.[4] Sediments in wetlands and watercourses throughout the site are contaminated with pesticides. The plaintiffs' prior application contains evidence of groundwater contamination by the pesticides, ethylene dibromide and dichlorodiphenyl-trichloroethane (DDT).

Put very simply, there is substantial evidence in the record to establish that a significant part of the property at issue here is laden with pesticides, as a result of the property's past use for tobacco farming, and those pesticides present the risk of an adverse impact or, at the very least, an impact of some kind, on the wetlands involved. It is undisputed that, because of this impact or the risk thereof, the plaintiffs recognized that a remediation plan was desirable in order to prevent that risk from becoming a reality in such a way that the wetlands would be adversely impacted. Finally, it is undisputed that the plaintiffs proposed a soil mixing plan as their solution to the question of remediation.[5]

With specific reference to the plaintiffs' soil mixing plan, the commission found that the plaintiffs' soil remediation proposal included mixing most of the site's contaminated soil, selective removal of severely contaminated soils in lieu of or following mixing, and replenishment of topsoils. The plaintiffs listed these regulated activities as identified and specifically numbered activities within the seventy-five foot upland review area under the commission's jurisdiction.[6]

The commission denied a permit for the plaintiffs' proposed soil mixing, seeding, removal and replenishment regulated activities within the seventy-five foot upland review area for the following specific reasons. First, the plaintiffs' data and the report and subsequent testimony of Emmanouil N. Anagnostou of the University of Connecticut, department of civil and environmental engineering, confirmed that levels of pesticide contamination vary significantly among soil samplings

at the site. The plaintiffs had not identified all portions of the property containing pesticide levels that are much higher than the levels present in surrounding soils and sediment; these areas are known as "hot spots." The plaintiffs and their consultant, however, assumed a uniform pesticide application level model without conducting "step sampling" and other tests. The commission specifically stated that it "*can not authorize the [plaintiffs] to perform the proposed soil mixing, seeding, removal and replenishment regulated activities without the benefit of data that reliably describes the pesticide levels present in all relevant portions of the site. To condition a permit on the [plaintiffs'] promise to secure better data unduly risks exposure to, and does not ensure safe, effective and permanent remediation of, such hot spots.*" (Emphasis added.)

The commission also specifically found that "*soil mixing is a relatively unproven, untested and unregulated remedial method that would likely result in immediate reductions in pesticide concentrations, but would spread the contamination to greater depths and possibly into wetlands, watercourses, perched and shallow groundwater, and other environmental media through increased leaching, erosion, sedimentation, volatilization and airborne deposition.*" (Emphasis added.) In this regard, the commission also specifically found that the plaintiffs' soil mixing data and information were limited to sites and studies where little or no postremediation sampling and regulatory review took place. In other words, there is little or no data available as to the actual effectiveness of soil mixing or the impact that it may have on the environment, in general, and wetlands, in particular. Case studies from New Jersey, supplied to the commission, indicated that New Jersey's efforts to assess remedial options for contaminated agricultural lands focused on sites where soils were contaminated with arsenic or dieldrin, not chlordane, and were blended with imported topsoils or selectively removed prior to mixing. New Jersey, however, has not reviewed or approved remedial methods similar to the plaintiffs' proposed plan. Unlike the sites in New Jersey, the plaintiffs' plan called for mixing of soils contaminated with chlordane at five to ten times the state cleanup criteria; postmixing of certain remaining hot spots; and the use of the average of postremediation concentrations measured across the site. The plaintiffs were not willing, however, to modify their soil remediation proposal to call for site-wide achievement of the cleanup criteria as New Jersey had required. The plaintiffs also rejected the procedure for excavating soil hot spots recommended by the town's remedial expert, which called for premixing removal for all soils where pesticides were estimated to exceed two times the state's residential direct exposure criteria.

Furthermore, the commission found that the plaintiffs provided no evidence that government agencies in

other states have approved the use of soil mixing over sensitive resources like the aquifers underlying the Meadowood planned residential development site and the site's system of highly functioning wetlands and watercourses. The plaintiffs' samplings of soil and groundwater suggested rapid depletion of measurable pesticides from the superficial soils, which increased the commission's concern that soil mixing could mobilize pesticides currently bound within those soils. This concern took on greater importance in light of the fact that the plaintiffs' pilot test area was not located in the most contaminated portion of the site. The plaintiffs' expert theorized that, in the period following the soil mixing pilot test, pesticides may have volatized or remained in chemical forms that his analytical methods had failed to detect. Thus, the commission stated: "*Remedial decisions for the site can not be made safely without better documentation of the fate and transport of pesticides following the proposed soil mixing remediation method.*" (Emphasis added.)

The commission found further that soil mixing to the depths proposed by the plaintiffs would reduce the organic content of existing topsoils and sediments that retain a large portion of the pesticide residues remaining at the site. This disturbance may increase pesticide mobility and result in greater transport of pesticides into perched and shallow groundwater that drains into wetlands and watercourses, and cause greater pesticide transport directly into wetlands and watercourses from mixed soils and sediments that erode or disperse into these areas. The commission was specifically concerned that this increased pesticide mobility may also result in contaminant migration into deeper groundwaters and aquifers underlying the site.

In addition, the proposed soil mixing regulated activities would disturb the soils up to four feet below the surface, a much greater disturbance than the tilling of fields involved in tobacco farming. The commission found that these disturbed topsoils were unlikely to support the lawns proposed by the plaintiffs for much of the site, and that the plaintiffs' proposal to import topsoil to the site as needed to replenish any damaged topsoil lacked specificity and assurance that the organic-rich topsoils that would be disturbed would not retain and concentrate pesticides that would be volatized after the mixing of underlying soils. Further, the commission found that "[t]he use of imported topsoil in regulated areas . . . [was] likely to affect, alter or pollute a wetland or watercourse through erosion, sedimentation or direct filling and is prohibited without a specific permit from [the] [c]ommission." In addition, the commission found that "[t]he inevitable use of fertilizers and other chemicals to maintain lawns . . . proposed in regulated areas, is also likely to affect, alter and pollute wetlands and watercourses . . . [and the plaintiffs'] proposed lawn maintenance plans [would]

be very difficult to enforce and . . . monitor.''[7]

The commission further addressed certain of the conclusions of the plaintiffs' consultant regarding the ecological risk assessment for the site's watercourses and wetlands, namely, that the consultant's sampling results indicated that they exceeded both the ''No Effect Levels'' and the ''Lowest Effect Levels,'' but did not exceed the ''Severe Effect Levels,'' thus leading to the consultant's conclusion that ''the ecological risk presented by the detected pesticides does not warrant a full ecological risk assessment.'' The commission stated, however, that ''the screening level memorandum is insufficient to support the [plaintiffs'] contention that soil mixing will not increase the bioavailability of contaminants in the wetlands.'' In this connection, the commission stated that organochloride pesticides absorb tightly to organic materials in the wetlands and watercourses, and accumulate in their soils and sediment. In particular, the commission stated that the plaintiffs ''*[need] to more fully assess the present condition of soils, sediment and water in . . . all wetlands and watercourses affected by regulated activities to determine whether they are in need of remediation, whether their flora . . . are particularly vulnerable to further pesticide contamination, and how to select and perform the regulated activities that will best maintain and enhance the long-term productivity of such wetlands and watercourses . . . . The [c]ommission also wishes to avoid unnecessary sedimentation and the risk of spreading contamination until the extent of sediment and other contamination in wetlands and watercourses has been determined and appropriate remedial action can be taken*.'' (Emphasis added.)

The commission also addressed the plaintiffs' proposal ''to achieve site-wide consistency with alternative pollutant mobility soil criteria set forth in the Remediation Standard Regulations,'' which are ten times the ''default criteria normally applied to a site like Meadowood . . . .'' The plaintiffs proposed to meet these alternative criteria by relocating soils from a certain strip of land ''and then mixing the relocated soils with soils at the new locations,'' and by ensuring that a ''site-wide property association indemnify all unit owners from any claims that may arise based on the off-site migration of pesticides through groundwater.'' In response, the commission noted that, because the site will be composed of many parcels, rather than one parcel, the plaintiffs' ''plan to address potential pollutant mobility is . . . inconsistent with the relevant pollutant mobility criteria provisions . . . [which] do not provide for grouping of lots into one large parcel, relocating soils to the interior of the group of parcels, and ignoring the potential for pollutants to mobilize into groundwater under individual lots within the group.'' Further, the commission found, the indemnification plan would not protect ''the quality of groundwater

under the site, nor the health of people exposed to pollutants migrating with groundwater that flows into wetlands and watercourses or wells used for irrigation, drinking or other purposes.''

Finally, the commission found that the ''standard erosion and sediment controls, as described by the [plaintiffs], are inadequate to control potential erosion and sedimentation that could occur during soil mixing.'' The commission also found that the plaintiffs' ''*soil remediation plan fails to address the risk that construction of roads, utilities, foundations and other subsurface features might interfere with the ongoing and future soil remediation efforts and disturb contaminated soils that have already been remediated. To ensure complete remediation prior to the completion of development features and to minimize soil disturbances, the remediation plan should carefully coordinate both remediation and construction activities.*'' (Emphasis added.)

To sum up these findings and analyses, without going into so much detail that the summary will be as intricate as the findings and analyses themselves, I read them to say, in effect: this is a site, containing wetlands and watercourses, that is already highly contaminated with pesticides and other contaminants because of its prior and current uses, and those pollutants exist throughout the site, particularly in places where they are highly concentrated in what are known as ''hot spots.'' Further, the plaintiffs' soil mixing plan, which is itself a regulated activity, is an untested and unproven method of remediation that carries with it significant risks of spreading those pollutants into wetlands and watercourses. The plaintiffs have not satisfied the commission that this untested and unproven activity will avoid or minimize those significant risks to the wetlands and watercourses and, therefore, the commission has determined to deny the plaintiffs' application.

In my view, the commission was well within its discretion in reaching that determination because of the fundamental premise that the applicant has the burden to establish that it is entitled to the permit its seeks. *Samperi* v. *Inland Wetlands Agency*, supra, 226 Conn. 593. Where, as is made clear by the foregoing lengthy set of findings and analyses, the plaintiffs seeking a wetlands and watercourses permit for a development present a new and unproven method of performing the regulated activity of soil mixing, the commission finds on the basis of the evidence before it that the method will pose specifically identified, significant risks of adverse impacts on the wetlands and watercourses within its jurisdiction, and the commission finds that the plaintiffs have not persuaded it that those significant risks posed to those wetlands and watercourses will not materialize, the commission is within its jurisdiction to deny the application. A contrary conclusion would,

in my view, shift the burden from the applicant, namely, to establish that it is entitled to the permit, to the commission, namely, to establish that the applicant is *not* entitled to the permit.

Put another way, it was an appropriate application of the substantial evidence test for the commission to determine that—given the undisputed nature and extent of the contamination of the site and its location with respect to the wetlands; given the undisputed need for some method of remediation regarding that contamination; given the fact that the plaintiffs' proposed method of remediation carried a risk of spreading the contamination into the wetlands and, thereby, adversely impacting them; and given the fact that the plaintiffs' proposed method of remediation was new and unproven—the plaintiffs simply had not carried their burden of establishing that they were entitled to the permit they sought. Under these circumstances, the commission did *not* have to find, or have evidence to find, that the regulated activity of soil mixing *would* adversely impact the wetlands; it was sufficient for the commission to find, based on all the previously mentioned ''givens,'' that the plaintiffs had not persuaded the commission that their new and unproven method of remediation would keep the wetlands safe from an adverse impact by the pesticides. To hold to the contrary, as the majority suggests, places the burden on the commission to establish adverse impact. That simply is contrary to our established law.

I therefore dissent, and would affirm the judgment of the trial court.

[1] As to part III of the majority opinion, I agree that we need not address on appeal claims that were not raised in the trial court. With respect to part IV of the majority opinion, because I believe that the trial court's judgment should be affirmed on the ground that there is sufficient evidence in the record to support the decision of the defendant conservation and inland wetlands commission of the town of Simsbury, I need not address the alternate ground presented by the commission for affirming the court's judgment.

[2] I note that during colloquies with the plaintiffs at the public hearings, one commission member disclosed that he or she has a PhD in organic chemistry and a membership in the American Chemical Society, and was a professor of organic and environmental chemistry at the University of Hartford from 1968 to 1997. The member is currently professor emeritus. Similarly, a second member disclosed that he or she is a chemical engineer and has worked as an environmental consultant for fifty years. These facts lend additional weight to the commission's findings, as disclosed herein.

[3] This conclusion renders it unnecessary for me to consider whether there were other reasons given by the commission that were supported by substantial evidence.

[4] Commercial use of chlordane, the most prevalent of the pesticides found to exceed safe levels on the property, has been illegal since 1988. Because chlordane does not chemically degrade or biodegrade in soils, it is capable of persisting in the environment for long periods of time. Chlordane binds closely with soil and sediment particles and, therefore, is relatively insoluble. It has been detected, however, in the wetlands of several states, including Connecticut, in groundwater, surface water, suspended solids, sediments and bottom detritus. Chlordane is moderately to highly toxic to humans and animals through all routes of exposure.

[5] I do not read the majority opinion to dispute any of these contentions.

[6] The plaintiffs do not dispute that their soil mixing plan reasonably may be regarded by the commission as a regulated activity.

[7] The commission heard testimony from several environmental experts, including David H. Lord, a soil scientist and environmental consultant with Soil Resource Consultants. Lord testified before the commission on July 6, 2000, that the plaintiffs' plans for controlling erosion, arising not only from the soil mixing, but also from future regular lawn and garden maintenance, would, at best, prevent 75 percent of potentially contaminated sediment from leaching directly into wetlands and watercourses. The commission further stated in its findings, generated to assist it in the decision-making process, that "[o]verland runoff and discharge of lawn fertilizers and pesticides from yard[s]" had the potential to impact two of the wetlands at issue, and that the settling of "fugitive dust particles" from the soil mixing may impact all of the site's wetlands and watercourses. Moreover, Joseph Pignatello, from the department of soil and water with the Connecticut Agricultural Experiment Station, presented the commission with a letter regarding the plaintiffs' soil mixing plan in which he called into question the plaintiffs' assurance to the commission that soil mixing would not impact groundwater on the site. Specifically, Pignatello stated that "[w]ith current knowledge, it is not possible to predict a priori the mobility of aged [pesticide] residues, nor the threat to groundwater from plowing the soils under. Nevertheless, plausible hypotheses about the effect of plowing-under on net releases of residues can be made. One is that plowing would physically disturb the soil structure leading to mobilization of colloidal particles (i.e., particles less than about one micrometer in size). These colloids could, in principle, carry pesticides 'piggyback' down to the groundwater where they would subsequently become dissolved in the water. This possibility is subject to experimentation. Another hypothesis is the following: Natural organic matter levels are usually much higher in the topsoil than in the subsurface, even though the rate of decay is greater in the topsoil. This is because the topsoil is continually replenished with fresh organic matter in the form of plant litter. Natural organic matter in the subsoil decays at a slower rate, but it is not replenished with much plant litter. Thus, burying topsoil particles will likely result in decline of their initially relatively high natural organic matter levels, down to the relatively low levels characteristic of subsurface particles. If the natural organic matter concentration is decreased, the particles may have less of a 'hold' on pesticide residues bound to them. Thus, according to this scenario, burial could possibly result in release of pesticide residues. In practice, such release might be so slow as to have no net impact on water quality. On the other hand, there is the possibility that the quality of the natural organic matter in the subsoil is different than that in the topsoil, such that the natural organic matter in the subsoil has a higher affinity for the pesticide. This would counteract the trend toward release that decay of the quantity of natural organic matter, as just mentioned, would accomplish. The slow rate of natural organic matter decay would make it difficult to validate or invalidate this hypothesis. In principle, such hypotheses are subject to experimental verification. . . . In the absence of tests my hypotheses or anyone else's is just that—a hypothesis."