

**STATE OF VERMONT
PUBLIC SERVICE BOARD**

Docket No. 7156

Petition of UPC Vermont Wind, LLC for a Certificate of)
Public Good pursuant to 30 V.S.A. section 248,)
authorizing it to construct up to a 52 MW wind electric)
generation facility, and associated transmission and)
interconnection facilities, in Sheffield and Sutton, Vermont,)
and operate the same.)

**PREFILED REBUTTAL TESTIMONY OF
ARTHUR V. GILMAN**

ON BEHALF OF UPC VERMONT WIND, LLC

September 25, 2006

Summary:

Mr. Gilman responds to the issues raised by UHS/RPI witness Marc Lapin regarding wetlands, rare plants, and natural communities. In addition, he presents the results of additional field work related to those issues and to the revised project layout.

1 **Q. Please state your name and occupation.**

2 Response. Arthur V. Gilman, Principal, Gilman & Briggs Environmental.

3

4 **Q. Have you previously testified in this proceeding?**

5 Response. Yes I have.

6

7 **Q. What is the purpose of your testimony?**

8 Response. To respond to the issues raised by UHS/RPI witness Marc Lapin regarding
9 wetlands, rare plants, and natural communities. In addition, I present the results of
10 additional field work related to those issues and to the revised project layout.

11

12 **Q. What materials have you reviewed and other activities have you undertaken in**
13 **preparing this testimony?**

14 Response. I have reviewed the prefiled testimony of UHS and RPI witness Dr. Marc Lapin,
15 and his responses to UPC Vermont Wind discovery questions asked of him, and other
16 materials provided in response to discovery. In particular, I have reviewed the resource
17 map prepared by Dr. Lapin, in relation to the revised project layout ***Exhibit UPC-AG-***
18 ***Reb1***, and I have conducted additional field investigations, especially in regard to the revised
19 project layout. This additional field work included additional wetlands delineations and rare
20 plant searches.

21

1 **Q. Please further describe the additional field work you undertook, and explain the**
2 **results of this work.**

3 Response.

4 Turbines Sites: The project now consists of only 16 turbine sites, and these are,
5 except for one instance, not located specifically where the original turbine sites were
6 proposed. Therefore, I visited each new turbine site individually (except Site C14, which is
7 near the original turbine site) to investigate conditions on the ground. Additional wetlands
8 were delineated in the areas of revised turbine sites C2, C8, and C1.

9 Access Roads: The proposed access roads have also changed, with the primary
10 access now planned from the west off of Duck Pond Road and “internal” accesses changed
11 more or less throughout the site. I delineated wetlands along the proposed access road as it
12 is now proposed. I also inspected the proposed ‘internal’ access roads, specifically, all of the
13 proposed access roads between the turbine sites, except to revised turbine C14, which is in
14 the general location of the previously proposed road, and delineated wetlands along them.
15 There are some areas of wetlands along these roads.

16 Electrical Lines: The project also now includes a proposed location for the overhead
17 powerline that will transmit electricity from the turbines to the substation. I have not
18 inspected the entirety of the corridor of this line, which has not yet been finally designed, but
19 anticipate doing so prior to final design. I anticipate only minor wetland issues, involving
20 access to poles, and clearing in forested wetlands for the corridor.

1 Substation: I have also delineated additional wetlands in the area of the proposed
2 substation, and have advised UPC Vermont Wind that it is necessary to avoid wetlands to
3 the maximum possible extent there.

4 Stormwater basins: I have not yet reviewed the sites of the proposed stormwater
5 treatment basins.

6 New meteorological tower: I have not yet reviewed this site; however, it is on a knoll
7 and I anticipate that there are no wetlands there.

8 Maintenance Building: I have not inspected the location of the proposed
9 maintenance building but anticipate doing this prior to final design. I anticipate only minor
10 wetland issues. I have advised UPC Vermont Wind that avoidance of wetland areas will be
11 important in this facet of the project, and I believe that there is sufficient upland on the
12 overall project site to find a suitable location for a maintenance building. UPC has advised
13 me that it has sufficient flexibility in the siting of this building, and will be able to select a site
14 that avoids wetlands.

15 RTE Species: While performing the wetlands delineations and reviewing these sites,
16 I also searched them for rare, threatened, or endangered species or rare natural communities.
17 I did not find any such species or communities. Dr. Lapin has identified one species which
18 he considers significant, Goldie's fern, but which is not a rare, threatened, or endangered
19 species. I have mapped one population of this fern in and around the C4 turbine site. *See*
20 ***Exhibit UPC-AG-Reb2***. I also noted one plant of another "S3" species (uncommon, with
21 20-100 locations known statewide), slender wheatgrass (*Agropyron trachycaulon* [*Elymus*

1 *trachycaulus*]), near but not within the footprint of the proposed access road from New Duck
2 Pond Road.

3 The wetlands within the footprint or in close proximity to the project components
4 are depicted on the detailed project maps, *Exhibit UPC-CRV-Reb4*. In addition, the
5 wetlands are listed and described in a table, *Exhibit UPC-AG-Reb3*.

6
7 **Q. Do you agree with Dr. Lapin that the project area contains the following resources,**
8 **as summarized in his testimony on page 6, lines 11 to 29:**

9 1) **An unusually large concentration of seepage wetlands?**

10 2) **An exceptional example of a rich fen?**

11 3) **Large blocks of rich northern hardwood forest?**

12 4) **A very mature northern hardwood forest that exhibits old-growth forest dynamics,**
13 **and is potentially “old-growth”?**

14 5) **Three A-ranked plant species populations?**

15 Response. Let me respond to these questions individually. In these maps, I will refer to
16 *Exhibit UPC-AG-Reb1*, which is a copy of Dr. Lapin’s resource map with the turbine sites
17 overlaid.

18 1) Seep wetlands: I have observed similar seeps in similar numbers elsewhere in
19 Vermont, and I do not believe that this site has a particularly large concentration. As noted
20 in my previous testimony, many of the wetlands on the overall site are characterized by
21 groundwater discharge, i.e., they are seeps.

1 I will note that I have only observed one of the seeps marked on Dr. Lapin's map,
2 which is near revised turbine site C-1. This is my Wetland 28. I presume that the other
3 seeps Dr. Lapin identified exist, but they are not within or in proximity to the project
4 footprint. In regard to the revised layout, my Wetland G6-110, which is a continuation of
5 my earlier delineations of Wetlands 32 and 34, is of similar character. This seep lies along
6 the proposed access road between revised turbine sites C-3 and C-6, and I have advised UPC
7 Vermont Wind to cross this wetland/seep at a narrow spot. Another wetland of similar
8 character is along the proposed access road, Wetland G6-207. Again, this will be crossed at
9 a narrow location. These numbered wetlands are identified on *Exhibit UPC-CRV-Reb4b*,
10 as are the specific wetlands impacts.¹

11 2) Rich fen: In comparison with other fens, of which Caledonia County has a
12 number that I have personally observed, I do not believe this fen is an exceptional example.
13 I concur that the species occurring in this fen are those listed in literature (specifically
14 Thompson and Sorenson, 2000) under 'rich fen.'" However, because a number of species
15 that I would associate with 'rich' fens on a local level are lacking, such as showy lady's-
16 slipper, small yellow lady's-slipper, northern white cedar, and diandrous sedge, I would
17 classify it as an "intermediate" fen. Dr. Lapin also indicates that this fen is unusual because
18 it occurs at an elevation over 2000 feet. There does not seem to me to be any evidence that
19 elevation has affected the fen's floristic composition or ecology, and I believe that this aspect

¹ *Exhibit UPC-CRV-Reb4b* displays both individually numbered wetlands, as well as separately numbered "wetlands impacts" where project infrastructure will result in direct impacts to wetlands. Wetland numbers are indicated in blue; wetland impact numbers are indicated red.

1 of the fen is irrelevant. That said, I have advised UPC Vermont Wind to avoid impacts to
2 this wetland, and the project design appears to do so.

3 3) Rich northern hardwood forest: I concur that the area contains large blocks of
4 ‘rich northern hardwood forest.’ As stated in my original testimony, this is not a rare
5 community in Vermont. Given the underlying nature of the region as to bedrock
6 (predominantly the calcium-rich Gile Mountain and Waits River formation),² nutritive soils,
7 and climate, this is probably the so-called ‘climax forest’ community for much of the region.
8 For this reason, as explained in my earlier testimony, I extracted from this community the
9 areas of “very rich northern hardwood forest” (i.e., Wetlands 18 and 38), for special
10 consideration in project planning, based on recent research that shows that such areas are
11 usually small, discrete, and persistent, and are rare across the region.

12 Dr. Lapin’s map appears to be approximately correct as to the locations of the ‘rich
13 northern hardwoods’ community; I have not inspected all of these areas because some are
14 outside of the project footprint (previous and current). I would like to point to a few minor
15 issues. First, the patch of this forest type on the summit of Granby Mountain, generally west
16 of revised turbine C13, has been partially clear-cut, as can be seen by inspection of the aerial
17 photograph/map *Exhibit UPC-AG-Reb1*. The strips of cleared land, now reverting to
18 sapling growth, are apparent. Second, the site of revised turbine C14, inspected on
19 September 7, 2006, does not have such a community, although it may occur on the western
20 slope of the unnamed prominence near C14. Third, the site of revised turbine C6, as also
21 inspected on September 7, 2006, does not have a good example of this community. My field

² Doll. C. G., ed. 1961. Centennial Geologic Map of Vermont. Vermont Geological Survey. Montpelier.

1 notes indicate “open canopy of sugar maple over dense understory of heavily browsed 4’-5’
2 maple saplings; trees average 10” diameter (at breast height); little fern or herb diversity, lots
3 of *Caulophyllum* [blue cohosh].”

4 4) “Old Growth”: I have inspected the forest in the vicinity of revised turbine site
5 C13, and the proposed roadway to it, as well as other portions of this forest block. My field
6 notes for August 31, 2006 at the turbine site indicate “low dome crest, dry open woods,
7 dominated by beech with some yellow birch and some sugar maple.... sparse ground flora.”
8 In comparison with other ‘old growth’ forests that I have seen, specifically one in the town
9 of Marshfield where I reside, this forest block does not appear to me to be old-growth, as it
10 appears to lack large-diameter trees and a full range of size classes of trees. The Marshfield
11 site, however, is differently situated as to topography, being in a protected valley. Perhaps
12 on this +/- level plateau, large diameter, super-canopy trees would not have survived. I am
13 also aware that not all so-called ‘old growth’ forest features such trees. However, given the
14 ease of access to the site, the +/- level terrain, and the nearby farmstead, it does not seem
15 likely to me that it would have escaped clearing or forestry operations at some point. I
16 personally would need stronger evidence than what has been presented, i.e., Dr. Lapin’s field
17 note (point 200 for old “turbine site 12” and “route from [old turbine sites] 12 to 16), of
18 “intact forest”, and Mr. Engstrom’s field note (15) for the area, “uneven-aged forest . . . and
19 lots of logs in various stages of decay” to accept a determination that this is old-growth
20 forest.

21 5) A-ranked Plant Species: In regard to the three plant species populations, i.e.,
22 Braun’s holly fern, Goldie’s fern, and wood millet, I disagree that these are perhaps the

1 largest populations known in Vermont (Lapin PFT page 17, lines 21-24), although I would
2 concur that they are probably, albeit not rare as species, A-ranked or perhaps B-ranked
3 populations.

4 In regard to Braun's holly fern, it is known from at least 62 towns in Vermont,
5 including Sheffield and Sutton, ***Exhibit UPC-AG-Reb4***, and from 6 towns in Caledonia
6 County. I have personally seen larger populations in several locations, such as Northfield
7 Gulf, Paine Mountain in Northfield, and others. In any case, this species, while scattered
8 elsewhere, occurs most prominently in the project area in the zone that I had previously
9 pointed out as "very rich northern hardwoods," Wetlands 18 and 38, which are avoided by
10 the project layout.

11 In regard to Goldie's fern, a similar situation occurs. This species is known from
12 some 46 towns in Vermont, including 9 in Caledonia County, and I have elsewhere seen
13 equally large or larger populations, for example in Hardwick, Calais, Groton, Northfield, and
14 Brookfield. Again, it occurs here in greatest concentration in Wetland 18, which is avoided
15 by the project layout, although there are approximately 60 plants in revised turbine site C4,
16 and another 40 plants nearby but not within the proposed area of disturbance. ***Exhibit***
17 ***UPC-AG-Reb2***. There are also a couple of plants in revised turbine site C2.

18 In regard to wood millet, I admit that this species is little known to me, although I
19 have encountered it at a number of sites throughout Vermont, including both montane and
20 lowland areas. Its populations usually seem to be scattered and small; this overall population
21 on the Granby-Norris massif may be a relatively large one. It is known from 7 towns in
22 Caledonia County, including Sheffield and Sutton. Without mapping individuals of this

1 species across the mountain, I do not know the extent of the population, but the project
2 footprint is small in relation to the entire area, and I believe that most of the population
3 would fall outside of the proposed footprint.
4

5 **Q. Do you agree with Dr. Lapin's description of the quality and value of these natural**
6 **communities and habitat types?**

7 Response. In general, I think that the quality and value are somewhat overstated by Dr.
8 Lapin. They are certainly representative of their kinds, and there are, for sure, some small
9 areas within the greater project area that I concur with Dr. Lapin about: that is, some of the
10 seeps are high quality and extensive examples, as are the areas that I have pointed out as
11 "very rich northern hardwood forest." However, I do not concur that the 'fen' or the "rich
12 northern hardwoods" are exceptional.
13

14 **Q. Do you agree with Dr. Lapin that the project area includes a "rare and irreplaceable**
15 **natural area" due to the presence of these natural communities and habitat types?**

16 Response. I do not believe that the concept "rare and irreplaceable natural area" applies to
17 "landscape level" features and ecosystems except in very rare and nearly pristine instances,
18 of which this is not one. In Vermont, I might cite only such landscape level features as the
19 marshes at Sandbar, the delta of the Missisquoi River, or Camel's Hump.
20

21 **Q. Do you agree with Dr. Lapin that the roads would separate many of the seeps from**
22 **the surrounding forests and this would have a detrimental impact to those seeps and could**

1 **potentially lead to the disruption of the area's natural hydrology (Lapin PFT page 14, lines**
2 **12-18)?**

3 Response. I will speak primarily to the biology of the wetlands, as I am not a hydrologist.
4 Of the large seeps that have been identified in the project area -- Wetlands 28, 18, 19,
5 32/34/G6-110 (all parts of the same large wetland), 39, 40A, and G6-207 -- only two,
6 Wetland 32 and G6-207, will be directly impacted. The other large seeps will not be directly
7 impacted, nor do I believe that any potential indirect impacts will be significant.

8 The biology of the seeps is driven by hydrology, which modifies wetness (free water),
9 temperature, pH, and mineral nutrition. Potential impacts accruing to the hydrology and
10 therefore to the seeps, are addressed by UPC witness Jeff Nelson.

11 A certain suite of plant species typically grows in seeps, although only a few of these
12 species are actually restricted to the seep habitat, among which perhaps the most faithful and
13 apparent is scabrate sedge (*Carex scabrata*). The plant communities should, however, be
14 generally unaffected by the road, although an increase in light levels due to the forest gap
15 created by an adjacent road opening may favor some species that already occur in the seeps
16 over others (i.e., primarily in Wetland G6-110). Short of wholesale 'flooding out' or 'drying
17 out' of these habitats, I feel it is doubtful that there would be any invasion by plants not
18 already occurring.

19 I mentioned in my previous testimony the presence of salamanders in seeps, and this
20 will likely continue. These seeps are not 'vernal pools' that will normally provide breeding
21 habitat for many species. Those amphibian species that are present are generally resident
22 within the wetland and are not dependent on unbroken adjacent forest, as are those species

1 that are pool-breeders. In any case, I would note that roads do not necessarily present
2 barriers to amphibians, including salamanders. Elsewhere in Vermont, amphibian species
3 such as wood frogs, newts, and salamanders, are often noted crossing well-traveled paved
4 and non-paved roads, often in large numbers, to reach breeding habitat. The proposed
5 unpaved road in the project area, without traffic on warm spring nights when many
6 salamanders breed, would not be an obstacle to them. Ongoing traffic related to project
7 operations is anticipated to be relatively light, particularly at night when the predominant
8 amphibian migration activities occur. Considering too the often low levels of outbreeding
9 (i.e. moving from one local breeding population to another) required to sustain genetic
10 diversity,³ it would seem to me that the level of impact presented by this project would not
11 be unduly adverse to amphibian populations going into the future.

12
13 **Q. Do you agree with Dr. Lapin that the project will cause fragmentation that will have**
14 **adverse impacts to the hardwood forests, wetlands, and A-ranked plant populations?**

15 Response. No. Most effects of ‘habitat fragmentation’, although noticeable at low levels of
16 forest clearing,⁴ are not severe until the habitat is severely broken up into small, discrete and

³ (Hanski, I. 1999. Metapopulation Ecology. Oxford University Press. New York. At p. 108: “The level of gene flow that is sufficient to prevent substantial population differentiation [i.e., to maintain population integration] is surprisingly low. . . [In one major model], noticeable local differentiation is possible only if . . . the populations exchange less than one individual per generation on average.”). *See also*, Gillespie, J.H. 1998. Population Genetics: a concise guide. Johns Hopkins University Press. In a discussion of subdivided populations using an ‘island’ model, at p. 100: “If more than one individual migrates every other generation, then the effects of isolation become unimportant. . . . The message is clear: very little migration can make a subdivided species appear like one large randomly mating species when neutral alleles are involved.”

⁴ For example, Buford and Capen (Journal of Wildlife Management 63: 180-188, 1999), in a study in the Green Mountain National Forest, found that nesting and nest-success of some forest interior songbirds can be affected at a level of 10% clearing over a large landscape.

1 isolated patches. In regard to the forest (i.e., tree) community, I think that it will continue,
2 essentially unaltered, up to the edges of the project clearings. The species of trees present
3 are all capable of dispersal far more than the widths of the roads (16' for access roads, 36'
4 for turbine roads during construction, with revegetation back to 16'), and far more than the
5 1 acre +/- clearings for turbine sites (all of which will revegetate except an approximately 50'
6 diameter area).

7 My thoughts in regard to the wetlands, many of which are seepage wetlands,
8 especially on the upper areas of the project, are described above. In addition, my comments
9 below address this issue with regard to the revisions to the project layout. In the lowlands,
10 there will be some forest clearings, e.g., along the powerline transmission corridor, that will
11 convert forested wetlands to scrub/shrub wetlands. As commonly occurs, noticeable
12 changes will likely occur to these wetlands adjacent to the project, with increased light levels,
13 etc. However, these are direct and nearby secondary impacts, and do not derive from
14 'fragmentation.'

15 In regard to the A-ranked plant species populations, I would note that ferns (Braun's
16 holly fern and Goldie's fern) are spore-dispersed and although the dispersal is normally
17 heavily weighted to near areas, their potential for long-range dispersal across many possible
18 barriers is often remarked.⁵ I anticipate that there would be no detectable change in the fern
19 populations due to 'fragmentation.' In regard to wood millet, I am unable to comment
20 because I do not know the species sufficiently; however, it must have some significant

⁵ E.g., Barrington, D.S. 1993. Ecological and historical factors in fern biogeography. *Journal of Biogeography* 20: 275-279).

1 dispersal ability to have colonized most of Vermont (it is known to be in 11 counties of the
2 state) and much of the entire forested Northeast as a species that is not overly rare.

3
4 **Q. Do you agree that seeding and mulching will introduce non-native species that will
5 degrade the existing natural communities (Lapin PFT page 26, lines 1-4).**

6 Response. That potential is always present; however, for this project the use of normal
7 conservation-oriented seed mixes for erosion control would not be anticipated to introduce
8 problematic, invasive species, as the composition of such mixes is well-controlled and does
9 not contain any species considered invasive in Vermont. The communities in the project
10 area are not among those that would be considered particularly vulnerable to invasion,
11 although any community can probably be invaded – i.e., the are open ‘habitat niches’
12 available in almost any community. Based on my personal observations, the ‘rich northern
13 hardwoods’ community seems to be relatively resistant to invasion. I would note also that
14 there are numerous non-native species within the project area at present, along logging
15 roads, along streambanks, and in the VELCO powerline corridor. There are, in fact, such
16 species even within the northern hardwoods; for example, false helleborine (*Epipactis*
17 *belleborine*), a European orchid, is found more or less throughout the project area. However,
18 from what I have observed on the site, the species present are not among those considered
19 problematic.

20

1 **Q. You have already responded that the fen at this site is not an exceptional example of**
2 **this type of wetland even though it occurs at an elevation higher than usual for the region.**

3 **Do you believe the project will adversely impact this fen?**

4 Response. No, I do not. I have advised UPC Vermont Wind to avoid impacts, and believe
5 that none will accrue because the road is well away from the fen edge and the culvert for the
6 seasonal stream will be properly-sized.

7
8 **Q. Please describe the effects of UPC Vermont Wind's revised layout in terms of**
9 **mitigating potential impacts to wetlands, rare species, and natural communities.**

10 Response. I am pleased with the changes that UPC has made in revising the project layout.
11 These changes have been made at least partly in response to my advice to them.

12 First, by eliminating the Hardscrabble Mountain portion of the project, any potential
13 impact to the listed endangered species, woodland cudweed, is avoided. Also avoided are
14 direct and secondary impacts to some wetlands.

15 Second, by eliminating the proposed road crossing in the area of the beaver dam
16 (Wetland 22), the issue of a potential barrier to upstream/downstream movement of small
17 wildlife and amphibians is avoided, and the potential for water quality diminution in the
18 stream due to any 'washouts' is also avoided.

19 Third, the access to revised turbine sites C13, C12, C15, and C2 is moved away from
20 the 'beaver pond' wetland (Wetland 22), leaving this wetland with a much larger 'buffer
21 zone' on its south side.

1 Fourth, much of the ridge of Norris Mountain is avoided, with tower sites reduced
2 from 6 to 2. This effectively avoids much of the “rich northern hardwood forest” at issue in
3 Dr. Lapin’s and my testimony, and moves the project further away from one area (Wetland
4 38) of “very rich northern hardwood forest.” This revision also removes the project from
5 the vicinity of two wetlands believed to be functional vernal pools (Wetlands 46 and 47), and
6 leaves those pools with 100% of their current surrounding natural forest habitat for species
7 that may use them.

8 Finally, the steep roadway between the original Turbine Sites 7 and 14 on the east
9 slope of “Barrett Mountain” is no longer contemplated. This road would have necessitated
10 extensive ‘cuts and fills’ and although not involving large wetland areas, would have been
11 difficult to maintain, and would, perhaps, have “fragmented” the forest more than any other
12 feature of the original proposal.

13 Overall, I think the project revisions have helped to make the project better from an
14 environmental standpoint.

15
16 **Q. Do you have any other comments on the plan revision?**

17 Response. Yes. The proposed access road and new turbine sites involve a number of
18 wetlands that were not on the original proposal; these are shown in the revised site plans
19 ***Exhibit UPC-CRV-Reb4b***. I have summarized their status and potential impacts on the
20 revised wetland tables, ***Exhibit UPC-AG-Reb3***. I would like to make a few comments
21 here. First, these wetlands are all Class Three wetlands under the Vermont Wetlands Rules.
22 A wetland at New Duck Pond Road may drain to a Class Two wetland, although it is not

1 mapped on the project site. While I did not have access to intervening private lands to
2 determine whether a positive connection (“contiguity”) exists, it appears that it does not
3 connect, and if so, would not be a Class Three wetland. If it does connect, then the Project
4 will need a Conditional Use Determination from the Agency of Natural Resources for the
5 upgrade of the existing access in that localized area. On the other hand, the revised layout
6 eliminates the use of an access road near a Class Two wetland (pond) off of Dareios Road.

7 Second, none of the wetlands has exceptional functional significance. They are
8 generally significant for water quality maintenance, as is the case for many wetlands in the
9 overall project area. The most significant would be Wetland G6-207, which as noted above
10 is a large forested seep, and others along seasonal and permanent streams are valuable for
11 erosion control. None are of the character of the beaver dam wetland, which would have
12 been impacted by the original proposal, and was demonstrated to have a high number of
13 functions and values. The wetlands functions and values for each wetland are noted in the
14 attached table, *Exhibit UPC-AG-Reb3*.

15 Third, as noted above, I observed no rare, threatened or endangered species in the
16 revised project footprint, including access roads, nor any rare and irreplaceable natural
17 communities. I did note a couple of Goldie’s fern at Turbine Site C2, and about 60 at
18 Turbine Site C4. I noted a Braun’s holly fern at one site along the road, and one small patch
19 of wood millet along the road also. I also noted one plant of slender wheatgrass (S3) near
20 but not within the road footprint.

21 The revised project layout will result in a greater area of impacts to Class Three
22 wetlands. I understand that UPC has opted for the New Duck Pond access point, even with

1 the additional wetland impacts that occur along the route into the site, in order to avoid
2 using Dareios Road near the King George School. The impacts to the wetlands will be of
3 similar character as the original proposal, and although greater in total area (1.16 acres vs.
4 0.46 acres), should still be manageable with proper design of the roads and culverts, and
5 should not result in undue adverse impacts. The area of the impacted wetlands at the
6 turbine sites and upper access roads went has been slightly reduced, and in particular the
7 revision avoids impacts to the area of the beaver dam. Most of the new wetlands impacts
8 (0.74 acres) are associated with the new access road from New Duck Pond Road.

9
10 **Q. Does this conclude your testimony at this time?**

11 Response. Yes it does.