

**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
DAVID RAPHAEL**

ON BEHALF OF UPC VERMONT WIND, LLC

September 25, 2006

Summary:

Mr. Raphael responds to issues raised by other parties regarding visual aesthetics, and compliance with section 248(b)(1). He also discusses the affect of the revised project layout on visual aesthetics.

1

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

2 Response. My name is David Raphael, and I am a landscape architect, planner and
3 educator.

4
5 **Q. Have you previously filed testimony in this matter?**

6 Response. Yes, I have.

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

9 Response. The purpose of my testimony is to respond to issues or concerns raised
10 with regard to my original testimony and exhibits, and to present a visual analysis of
11 modifications UPC is now proposing to make to the Project.

12

13 **Photo Simulations**

14 **Q. The simulations of the Project included with your direct testimony and**
15 **exhibits have been criticized by Messrs. Dodson, Jewell and Brown, among others,**
16 **as inaccurate. Please explain the method that you use in creating photo simulations**
17 **and why that method guarantees that the results are as accurate as possible?**

18 Response. I have to begin by re-stating several general points about simulations.
19 First, simulations are just that – simulations. By their very nature, simulations
20 represent what one might see once the project is constructed. Mr. Dodson’s claim to
21 present “actual” representations of the proposed project in the simulations attached
22 to his testimony is inaccurate: there can be no “actual” representation of this
23 project, as it has yet to be constructed. Second, simulations are only as accurate as

1 the data available to construct them with. There is a certain “plus or minus” range,
2 for example, when working with GIS data and digital elevation models and contours.
3 Third, there is inevitably some degree of subjectivity involved both with rendering
4 the elements, as well as selection of the day or conditions for the photograph which
5 will be the basis for the simulation.

6 Simulations provide us a general sense of what things will look like, and must
7 be viewed with that and the foregoing qualifications in mind. Most of the
8 simulations filed in this case by us and other parties provide similar views and
9 representations. We can argue ad infinitum about elements such as relative shadows,
10 lighting and contrast, but each of these will be different on different days, in
11 different light, with different sun angles. A simulation presents a theoretical
12 snapshot of a project pre-construction, which may actually occur post-construction
13 frequently, rarely or never.

14 Given all of the above considerations, LandWorks has endeavored to
15 provide the most accurate simulations possible given accepted techniques and
16 available data.

17 Our simulation technique and methodology, software and hardware, and data
18 sources were extensively outlined in Attachment 22 of Exhibit UPC-DR-2. Visual
19 simulations have been cross-referenced with line of sight sections. The effect of
20 light and the resulting shading on the simulated turbines have also been cross-
21 referenced by inputting approximate latitude/longitude, approximate turbine
22 elevation and specific view photograph time and date into 3D modeling software.

1 All final photographic rendering of turbines is created at 600dpi to ensure that fine
2 detail is maintained.

3

4 **Q. Mr. Dodson, Mr. Brown and Mr. Jewell variously characterize your visual**
5 **simulations as accurate only under “best case scenario” lighting and weather**
6 **conditions, or claim that they understate the visibility of the turbines through**
7 **misleading shading, highlights, and tones. Do you have a response?**

8 Response. Please see the answer to the previous question. Further, “best case
9 scenario” would be a heavy snowstorm, dense fog or heavy rain, obscuring the
10 project area from sight altogether. Such climatic conditions undoubtedly will occur
11 on a regular basis. No effort was made to record specific conditions in order to limit
12 the impact of simulated turbines. Conditions recorded vary from crystal clear winter,
13 to fair weather summer clouds and sun, to varying degrees of fall and summer
14 overcast, to summer haze and humidity, all common weather conditions in the
15 Northeast Kingdom. Photos used in the simulations were taken at various times of
16 day, ranging from late morning to early evening, and on dates ranging from early
17 September to mid-December. They capture a wide range of atmospheric and
18 lighting conditions. Most important to note, Landworks simply took the
19 photographs on the days it could schedule site visits; there was no effort to choose
20 conditions that would somehow dictate an outcome.

21

1 **Q. Mr. Dodson specifically claims that your photo simulation of the view of the**
2 **turbines from Crystal Lake State Park reduces turbine visibility by improperly**
3 **rendering highlights and shadows on the towers. Do you have a response?**

4 Response. Please see the answer to the previous two questions. In addition, the
5 rendering differences between LandWorks' Crystal Lake simulation and Mr.
6 Dodson's simulation using the same photograph are very subtle. This subtle
7 difference can be attributed to Mr. Dodson's assumptions about light quality and
8 intensity, as he interpreted them from the photo, and the consequent choices he
9 made in rendering the simulations based on those assumptions. Exhibit DPS-MK-1
10 Figure 5A presents yet another subjective rendering of turbines as they might be seen
11 from Crystal Lake, showing bright white turbines with little shading, under high
12 cloud/partly overcast conditions. Any or all of these conditions could occur;
13 LandWorks chose conditions based on fair weather and suitable days for
14 photography. No effort was made by LandWorks to limit simulated visibility.

15

16 **Q. Mr. Dodson has submitted altered versions of your visual simulations, which**
17 **he claims more accurately represent the true appearance of the turbines, HD-1. Do**
18 **you agree that Mr. Dodson's alteration of your simulations improves their accuracy?**

19 Response. No. In these altered versions of our simulations, many of the turbines
20 are rendered too dark, even as far as to be completely silhouetted against the sky,
21 sometimes darker than the ridge on which they stand. The set of conditions present
22 on the day and at the time we took these photographs would not result in such a
23 dark silhouette - and because Mr. Dodson was not present when these photographs

1 were taken, he did not experience the conditions and therefore cannot portray them
2 accurately. The dark, often blurred shapes presented in HD-1 overstate the turbines'
3 potential visual impact. Also, it is apparent that Mr. Dodson's simulations do not
4 match the computer modeling that served as the basis for turbine position and
5 elevation. As a result, the potential visibility of some turbines is overstated. See
6 ***Exhibit UPC-DR-Reb1***, Evaluation of Dodson Computer Model and Simulation,
7 for a brief outline of some inaccuracies.

8

9 **Q. Mr. Dodson has submitted photo simulations of nighttime views of the**
10 **turbines, HD-11. Would you please describe the method, as you understand it, that**
11 **Mr. Dodson has used to create these exhibits and explain why you believe these**
12 **methods have resulted in error?**

13 Response. Mr. Dodson employed computer modeling and 55mm nighttime
14 photography of one particular beacon. Elevations of the beacon, distances and
15 elevations of photographs taken, and specific beacon location and specifications
16 were not provided. It is clear that distance has not been accounted for when
17 rendering the simulated lights. For example, View #2 presents a simulation closer to
18 the project area than View # 3, yet the lights are considerably larger in View #3 than
19 in #2. The same is true for Views #4 and #5 – #5 is more distant, yet shows
20 brighter, larger lights. Views #8, #9 and #10 show lights of the same size and
21 brightness, yet the distance of the view is increasing, respectively.

22

1 **Q. Do the inaccuracies you note in Mr. Dodson's nighttime simulations distort**
2 **the likely visibility of the proposed project?**

3 Response. Yes. I do not believe these simulations are useful, and, in fact, I believe
4 they are misleading. It is extraordinarily difficult to render a nighttime simulation,
5 and as with all simulations, nighttime simulations vary greatly with atmospheric
6 conditions as well as viewing location. Mr. Dodson's simulation does not accurately
7 portray the intensity of the light when viewed from the purported distance, nor does
8 it necessarily account for the severe angle of cut-off for the light spread, which is 3
9 degrees below a level line from the center of the light, as the light is not intended for
10 ground visibility, but rather for visibility from airplanes. Mr. Dodson does not know
11 what the final light configuration will be, and as stated, cannot accurately compute
12 the brightness of the light when seen from specific distances.

13 Finally, it is important to note that the impact of these red lights on
14 nighttime sky viewing is not substantial, nor are there likely to be large numbers of
15 individuals viewing the lights at night, because people do not tend to recreate at night
16 or spend long hours outdoors after dark, unless in areas already well lit, such as
17 lighted ballfields, backyards, etc. People do not typically drive at night for the views,
18 either.

19

20 **Q. Mr. Kane has submitted photo simulations of the view of the turbines from**
21 **Crystal Lake, King George School, King George School Pond, and Interstate 91.**
22 **Please comment on Mr. Kane's method and results.**

1 Response. In general, we agree with Mr. Kane's method and resulting simulations,
2 although we have a few minor points of disagreement.

3

4 **Q. Are Mr. Kane's photo simulations substantially similar to yours in their**
5 **representation of the level of visibility of the proposed project?**

6 Response. Substantially, yes. The turbines are rendered to appear bright white
7 against the sky, which is essentially accurate under the blue sky conditions of the
8 King George views, but the I-91 and Crystal Lake views could be rendered
9 differently in regard to sky and lighting conditions. Throughout the figures, the
10 appearance of the turbines is relatively consistent, while sky conditions vary
11 somewhat from clear to high clouds. In general, Mr. Kane's simulations more
12 closely resemble LandWorks' simulations than Mr. Dodson's Exhibit HD-1.

13

14 **Viewshed Issues**

15 **Q. Mr. Dodson, Mr. Brown, and Mr. Jewell claim that your View from the Road**
16 **Map (UPC-DR-2, Attachment 10) fails to identify or understates many views of the**
17 **turbines from I-91 and VT Rt. 5, and neglects to consider potential views from**
18 **secondary local roads, or from private driveways. How do you respond?**

19 Response. In producing the LandWorks View from the Road Map (UPC-DR-2,
20 Attachment 10), we employed the following methodology to determine visibility: 1)
21 First, we used viewshed maps to identify areas of potential visibility; and, 2) Second,
22 we drove roads in both directions with a passenger to determine where and for what
23 duration the turbine locations might be visible. We determined duration by tracking

1 the mileage to the tenth of a mile over each stretch of road from which there was a
2 possible view. We drove the road during periods with both leaf on and leaf off
3 conditions. Based on the mileage tracked, the portions of roads for which there was
4 visibility were identified in a new GIS data layer. This layer is shown in the map
5 legend either as yellow lines (“views”), or as yellow stars (“glimpse”).

6 Again, this layer is based on actual field check and actual measurement of
7 mileage. The views identified are those of a driver and a passenger in a car traveling
8 anywhere between 35-65 mph. They are not necessarily the views of an average
9 traveler, but those of a driver and a passenger whose sight is fixed on the known
10 project area from the first point of visibility to the exact point the project area drops
11 out of visibility. This method therefore overstates the extent to which the average
12 traveler would likely see the project, since travelers are much more likely to be
13 concentrating on their driving or otherwise preoccupied. There is no deliberate
14 understatement of views or misrepresentation of views, simply a record of views
15 observed in the field.

16 As the map indicates, we studied only major roads within the immediate
17 vicinity of the project area, as these are the roads that the general public travels most
18 frequently, and views from these roads would therefore have the greatest impact. To
19 study every private driveway and secondary road within the 10-mile radius would
20 have been onerous and unreasonable. Viewed from a distance of 10-miles or greater,
21 the apparent scale of the turbines is reduced to such an extent that there is little if
22 any visual impact. Moreover, Quechee does not require consideration of every
23 private, individual view within a 10-mile radius; it is generally accepted that views

1 from areas of public congregation are those that should be considered for purposes
2 of the Quechee analysis.

3

4 **Q. Mr. Dodson has submitted an alternate View from the Road Map (HD-3).**
5 **Please describe the method, as you understand it, by which Mr. Dodson developed**
6 **this map, and why it resulted in error.**

7 Response. Mr. Dodson appears to have relied solely on his computer generated
8 viewshed analysis. To date, he has not provided any information to the contrary, and
9 has not provided information from which we could determine which roads he or his
10 staff actually field checked or which we could use to confirm which portions of
11 roads actually have views of the Project.

12 A viewshed analysis, in this instance, is based on available GIS data that is
13 designed for regional scale analysis and in many instances can overestimate the area
14 of visibility at a local scale. This is true because a viewshed analysis is based on raster
15 data, which is actually a grid of pixels (or cells), each with an assigned value, which is
16 of satellite or high altitude origin. This is opposed to vector data, or what most
17 people think of when they picture a map. The lines on a road map, the points that
18 indicate villages, and the polygons that enclose a town are good examples of a vector
19 map and its components (points, lines, polygons). This type of data looks the most
20 realistic to people, and when used in GIS applications can generate the most accurate
21 data. The sharpness or accuracy of maps created from raster data, on the other hand,
22 depends on the size of the pixel relative to the size of the area being mapped. One
23 meter, or even 3 meter pixels of an entire city can give a very detailed picture; 10

1 meter pixels of the same area look very blocky, but may be fine for an entire state.
2 All raster data used for the viewshed analysis, whether by LandWorks, Mr. Dodson
3 or Mr. Kane, is obtained from VCGI. The pixel cells for this data are 30 meters and
4 therefore allow for less accuracy. Viewshed analyses based solely on these data sets
5 also do not account for possible obstructions such as buildings, actual tree height
6 and density, site specific vegetation, variations in eyesight, or atmospheric and
7 weather conditions, resulting in an additional layer of imprecision.

8 LandWorks could have prepared a map like Mr. Dodson's, using the same
9 methodology. We determined, however, that a map developed on a micro-scale, and
10 actually based on field inspection, actual mileage tracked, and human-scale
11 observation would provide a more accurate depiction of visibility in the immediate
12 vicinity, than would a map based on raster cells of 30 meter accuracy.

13

14 **Q. Mr. Dodson and Mr. Brown both claim to have reviewed a draft version of**
15 **your Area of Potential Visibility Map (DR-2, Attachment 7), which identified a larger**
16 **area of visibility than your final map, and imply that inputs to the final map were**
17 **improperly adjusted to reduce the area of visibility. Please explain the reason for this**
18 **difference between the draft and final maps.**

19 Response. Several drafts of the viewshed map were developed in the months leading
20 up to the final application. Any draft map produced was identified as such – a
21 preliminary draft, subject to revision. Probable differences between the draft and
22 final maps include revised turbine locations and the release of a new land cover/land
23 use data layer from VCGI. VCGI released this data layer in November 2005,

1 updating the previous original land cover/land use data layer by 10 years. Other
2 than the use of new data layers, the methodology and parameters for generating the
3 viewshed map were the same for each draft prepared.

4

5 **Q. Mr. Dodson contends that you are incorrect in stating that the turbines will be**
6 **visible from only three percent (3%) of the land area. Mr. Dodson has submitted an**
7 **alternate viewshed map (HD-2), and claims that the total area with potential views of**
8 **the turbines within a 15-mile radius is actually over nine percent (9%), including**
9 **eight-two percent (82%) of the locations within a 15-mile radius where people view**
10 **the landscape on a daily basis. Would you please describe the method, as you**
11 **understand it, by which Mr. Dodson made this calculation and developed his**
12 **viewshed map, and why it resulted in error.**

13 Response. Mr. Dodson used a 15-mile radius to develop his viewshed analysis and
14 calculations, compared to the 10-mile radius used by LandWorks. Use of the 15-mile
15 radius factored an additional ~ 251,200 acres, or 25% more land mass, into the
16 equation. Mr. Dodson's comparison of his results to ours (9% compared to our 3%)
17 is therefore misleading. We chose a ten-mile radius based on the recommendations
18 of the Governor's Commission on Wind Energy Regulatory Policy, which states that
19 "view impact diminishes beyond this distance." Mr. Dodson, on the other hand,
20 does not explain his reasons for considering a 15-mile radius.

21 LandWorks plainly states the methods and assumptions used to prepare our
22 viewshed analysis. It is clear in our analysis that we assumed a 60 foot tree height.
23 Mr. Dodson does not disclose his assumptions for tree or vantage point height.

1 Different assumptions regarding vantage point height, and other variables may in
2 part explain the difference between his results and ours. That said, our 3% visibility
3 is accurate given the software and assumptions we used to calculate the original
4 viewshed. Our experience in the field also generally confirmed the overall accuracy
5 of our viewshed map.

6 We question what methodology and formula Mr. Dodson used in his 82%
7 calculation. In testifying that 82% of viewing locations will be impacted, does he
8 imply that all 82% of locations will be impacted equally? If not, Mr. Dodson has not
9 distinguished what percent will have foreground (dominant), middle ground, or
10 background views. His 82% calculation is therefore further misleading because it
11 does not take into account diminishing view impact.

12

13 **Q. Mr. Dodson contends that it is inappropriate to assume a sixty foot tree**
14 **height, and that this assumption understates that Project's visual impact. He also**
15 **claims that you inaccurately imply that visually impenetrable evergreen forests cover**
16 **most of the landscape. Do you have a response?**

17 Response. We have examined the difference between the viewshed if it were
18 developed with 40 foot trees versus 60 foot trees, and the difference is negligible.
19 The size of the open, viewing areas do not change whether the trees are 20 feet, 40
20 feet or 60 feet. What changes is that there may be a slight increase in the area from
21 which the proposed turbines could be seen within that open area, depending upon
22 the proximity of the viewer to the treeline. If the viewer is immediately adjacent to
23 the treeline, there would be no accessible view regardless of a 20, 40 or 60 foot tree

1 height. Also, where there are trees screening views, it is likely that these trees will
2 grow, and so the effective screening will only increase over time. Indeed, when the
3 viewshed with 40 foot tree height assumed is overlaid onto the viewshed with 60
4 foot tree height assumed, the areas that emerge are primarily along the edges of areas
5 from which a turbine or turbines may be seen. Scattered small new viewable areas
6 emerge, but there is no significant increase in viewshed area. At the Crystal Lake
7 area, there is actually no appreciable change.

8 I do not believe I characterized the forest cover as comprised predominantly
9 of visually impenetrable evergreens. I actually quote from an authoritative text on
10 this issue, on page 14 of Exhibit UPC-DR-2, in which the authors of Wetland,
11 Woodland, Wildland state that the forests “have a distinctly boreal character due to
12 the cold temperatures and short growing season”; I go on to state that there are
13 extensive evergreen forests coupled with lower elevation deciduous forests (also p.
14 14 of UPC-DR-2). It is important to understand that regardless of forest type and
15 cover, all trees have a stem density over a short distance that will preclude long
16 distance visibility through them even in winter. During the period when deciduous
17 trees and shrubs are foliated, both the canopy and understory area of the forest will
18 be difficult to see through, and depending on the nature of the woodland, that
19 visibility could be as little as 50 to 100 yards, as stated in Exhibit UPC-DR-2. Aerial
20 photos of the project environs and beyond confirm both forest densities and species
21 composition that support my conclusions. Additionally, please see Attachment 8, the
22 photo-inventory. Through the objective sampling of photographs, Attachment 8
23 provides sufficient evidence of the presence of evergreen trees as an integral and

1 major component of the woodland vegetation in this region. Attachment 16,
2 Simulation View 5, also shows the presence of evergreens in the landscape and the
3 forest density even in winter.

4

5 **Q. To the best of your knowledge, did you and Mr. Kane employ the same**
6 **general process in your viewshed analysis, and produce the same general results?**

7 Response. With respect to our viewshed maps, yes.

8

9 **Q. Mr. Dodson claims that your Matrix of Key Viewpoints Within 10 Mile Radius**
10 **(UPC-DR-2, Attachment 9) omits many important views from recreational areas and**
11 **roads. Do you have a response?**

12 Response. As stated previously, it is generally accepted that views from areas of
13 general public congregation are those that should be considered for purposes of the
14 Quechee analysis. These include highly traveled roads. Therefore, our matrix was
15 generated from the most comprehensive and widely accepted GIS information
16 available for public gathering places, recreation points, and municipal/state/federally
17 managed, conserved, and preserved lands. While it is possible that there are other
18 views in the area and places to recreate that are highly appreciated by those who use
19 them, the viewpoints we included are the most widely acclaimed, publicly known and
20 publicly accessed on a regular basis. Based on my extensive experience with the
21 Quechee test in Act 250 and Section 248 cases, as well as my work in aesthetic
22 assessment, I believe that we have provided a sufficient sampling of possible viewing
23 points from important recreation areas and roads.

1

2 **Q. Mr. Brown claims that your discussion of the views from Mt. Pisgah is**
3 **inaccurate, and that there will be a clear view of the turbines from that site. Do you**
4 **have a response?**

5 Response. I have hiked the Mt. Pisgah trails and observed very few potential viewing
6 locations. Views are limited to non-existent for most of the trail network because the
7 tree canopy is extensive and the trail is situated primarily within a dense forest with
8 overarching vegetation. Trail alignment and intervening topography also preclude
9 views looking west – Wheeler Mountain, Mt. Hor and the connecting high ground
10 intervene. The main cleared area on the summit provides direct, engaging views of
11 Burke Mountain and one very limited view of the Hardscabble Mountain area, which
12 is visible only above trees. (See UPC-DR-2 Attachment 8, page 3 for Mt. Pisgah
13 views.) Interestingly, Burke Mountain is well developed with ski lifts and trails, a
14 paved road to its summit, and an industrial array of towers, antennae and buildings at
15 its highest point. Other than that one distant view, there is only one viewing point
16 that I observed in the vicinity of the summit that will provide a “clear” view of the
17 turbines and that is the point from which we created Visual Simulation View 7. You
18 have to walk carefully down a steep, dangerous trail to a cliff edge in order to obtain
19 this view. I concluded, and still maintain, that views from Mt. Pisgah will be limited
20 to only a few locations. These views are at a minimum of 3.9 miles from any one
21 turbine in the Revised Layout.

22

1 **Q. Mr. Moffat suggests that the turbines will be visible from many locations on**
2 **trails in the Lake Willoughby area. Do you agree?**

3 Response. I do not agree as 1) this is a very general statement without specific
4 substantiation; 2) it is unclear what constitutes the Lake Willoughby area; and 3) this
5 is not borne out by my experience vacationing and hiking in the area. There is a
6 dense forest canopy on many of the trails on and around Mts. Wheeler, Pisgah and
7 Hor, for example, limiting views of any of the surrounding areas. These mountains
8 are the primary mountains surrounding the lake. Mt. Hor, for example, has only one
9 real viewing point that does not appear to be visited as frequently as the Pisgah
10 summit, and this vantage point does not invite long stays. Finally, I would add that
11 any views from the trail system around Lake Willoughby have a number of potential
12 areas of focus, including Burke Mountain, the Lake itself, the cliffs around the lakes
13 and on nearby mountains, and long distance views of the Northeast Highlands and
14 the Green Mountains. The wind turbines will be only one of many elements in the
15 “viewscape” and thus will not dominate or distract from the great expanse of
16 scenery.

17

18 **Q. Mr. Jewell and Mr. Brown have both submitted a number of photos taken**
19 **from sites from which these witnesses claim the turbines will be visible, and**
20 **accompanying maps of the locations from which the photos were taken. (WJ-2**
21 **through WJ-20, RPB-1, and RPB-3). Do you have any comment on these maps, or**
22 **these photos?**

1 Response. These photos are not informative without a accompanying specific data or
2 facts that substantiate the view, the extent of the view, and the nature of the view for
3 each location (1 turbine?, many turbines?, a partial view of a rotor?, etc.). This
4 information has not been provided to date.

5

6 **Miscellaneous Technical Issues**

7 **Q. Mr. Dodson claims that your analysis has not sufficiently accounted for the**
8 **impact of light flicker. Do you have a response?**

9 Response. We reviewed the light flicker issue and mapping prepared by
10 AWSTruewind, who evaluated the potential for shadow flicker using computer
11 modeling. See Exhibit UPC-CRV-20. Based on this information, we concluded that
12 the impacts were not widespread or serious enough to constitute an adverse impact.
13 Additionally, in my review of the literature regarding visual impacts of wind turbines,
14 light flicker impact is not typically of concern. This is perhaps due to the limited
15 geographic extent of this impact and the fact that in order to see light flickering, the
16 viewer has to be in a particular location relative to the sun as he/she is looking at the
17 turning rotors.

18

19 **Q. Mr. Dodson disagrees with your color matching analysis. Do you have a**
20 **response?**

21 Response. We do not agree with Mr. Dodson; we believe our color matching is
22 appropriate for the conditions present. Matching colors at a distance, especially
23 when dealing with the white bases of the turbine support towers, is difficult at best,

1 as color is influenced by light and light quality, as well as surrounding landscape
2 coloration. Atmospheric conditions also substantially influence perception of color.
3 For example, lake water changes color with sky conditions because there is a certain
4 amount of color absorption versus reflectivity that can vary depending on the
5 presence of sun or clouds. Haze implies more moisture in the air, which, in turn,
6 renders distant objects less distinct and often less colorful. A turbine tower that is
7 white or off white will blend effectively with clouds of a similar color behind it; in
8 sunlight the turbine will be brighter (with the sun shining directly on it from behind
9 the viewer) as it is reflecting direct sunlight; the turbine will be darker if the sun
10 position is behind the turbine.

11

12 **Q. Mr. Dodson has submitted his own Color/Tone Matching Study (HD-9). Do**
13 **you have any comment on this study?**

14 Response. I do not understand Mr. Dodson's study, or how it can be useful in this
15 review. It uses colors that are not applicable. Mr. Dodson's point is unclear, and I see
16 no utility in the use of the color chips as they are presented for analysis in this case.
17 If his point is to demonstrate blending properties of different colors and resulting
18 contrast levels, then it is of limited relevance because we have stated that the white
19 towers of the turbines will blend with backgrounds better under certain
20 circumstances than others. Contrast is subject to atmospheric conditions and sun
21 position, and this will be the case regardless of turbine color.

22

1 **Q. Mr. Dodson claims that your analysis has not sufficiently considered the**
2 **impact of night lighting. He specifically claims that the turbine lights will “eliminate**
3 **view of all but the brightest stars”, and produce a “flashing, glowing industrial sky**
4 **reminiscent of suburban Boston.” Do you have a response?**

5 Response. This contention relies on hyperbole, and makes an inapposite
6 comparison. Mr. Dodson offers no proof whatsoever that the red blinking lights will
7 obscure the view of the night sky. A study conducted on behalf of the Agency of
8 Natural Resources some years ago gauged the effect of the much more intensive
9 night lighting installation on Stowe Mountain Resort’s night skiing trails and found
10 that the lights on the mountain had little effect on night sky quality. The brightness
11 of the metal halide lights used for night skiing are many orders of magnitude greater
12 than the small red blinking lights that would be emitted from the turbines. The
13 Stowe study found more impact from the lights of Stowe Village, 6 miles away, on
14 night sky viewing than from the mountain lighting. I have personally observed
15 blinking red light installations similar to the proposed turbine lighting that have had
16 no effect whatsoever on viewing the night sky. There could be some effect on night
17 sky viewing in the immediate vicinity of the turbines, but I believe that blinking red
18 lights will not affect or have an impact on any night sky viewing from residences or
19 public locations in the project vicinity which are located 3/4 of a mile or more away.

20

21 **Q. Mr. Dodson claims that the methodology and scientific validity of the public**
22 **opinion studies you cite in your testimony is unclear. He further claims that public**
23 **reaction to the Searsburg facility does not predict public acceptance of the UPC**

1 **facility, since the Searsburg turbines are smaller, clustered and located on a hidden**
2 **ridgeline. Do you have a response?**

3 Response. All of the studies cited in UPC-DR-2 were scientifically conducted by
4 reputable professionals in the field. Mr. Dodson is certainly welcome to review the
5 methodologies explained in the reports, or to contact the individuals or organizations
6 who conducted these studies, should he have any doubts as to their validity. The only
7 exception to the scientific approach is Senator Doyle's survey, which is conducted at
8 town meetings across the state. Nonetheless, the results of Mr. Doyle's surveys are
9 often considered valuable and informative.

10 I do believe that the Searsburg study is relevant. It is consistent with other
11 post-construction evaluations of larger scale wind power projects. Though the
12 turbines at Searsburg are shorter than those proposed for this project, there is still
13 the before and after reality that compares the presence of no turbines with the
14 turbines in place. In addition, the Searsburg turbines are quite visible from some
15 fairly close locations, so that their visual impact is comparable to that of much larger
16 turbines seen from greater distances. The impacts thus can be considered quite
17 similar, despite the height differential. The Searsburg study demonstrates that public
18 opinions do change, and that people benefit from seeing the actual project and are
19 able to form a more complete and informed opinion post-construction.

20

21 **Impact of Roads and Other Infrastructure**

1 **Q. Mr. Kane’s report states that aesthetic impacts may result from construction**
2 **of roads, powerlines and substation improvements, and loss of “perceived wildness”**
3 **on lands opened to greater vehicular access. Do you have a response?**

4 Response. I note that Mr. Kane’s report states that Agency staff who evaluated this
5 issue determined that development of road and utility infrastructure could have a
6 “potential” impact, but did not conduct any in-depth investigation or analysis. It is
7 true that road construction and the development of the wind power project could
8 have an aesthetic impact, but we have determined that these impacts may not even
9 be adverse, and certainly will not be unduly adverse. Furthermore, we have
10 delineated the existing land uses on the project site and several key considerations
11 must be restated which refute Mr. Kane’s contention that there will be a perceived
12 loss of wildness. First, there are already a substantial number of roads and a
13 substantial amount of logging activity in this area. Second, there is a high voltage
14 transmission corridor running through the heart of the project area. Third, the area
15 will remain substantially forested or managed for forest resources. And fourth, this
16 area is not part of any public lands or park areas, and therefore is not generally or
17 readily accessible to the public, so changes within this area will not impact any
18 general public recreational use. A review of Exhibit UPC-CRV-13a will dispel any
19 sense that this area is a wilderness environment, given the presence of logging
20 activity and clearcuts, existing woods roads, transmission corridor and clearings.

21
22 **Quechee Test**

1 **Q. With respect to consideration of the 1st prong of the Quechee test, where do**
2 **you disagree with Mr. Dodson, Mr. Brown, Mr. Michaud, Mr. McCue, Mr. Jewell,**
3 **Mr. Kane, and Mr. Ide?**

4 Response. We disagree on several points.

5 1. Nature of the Surrounding.

6 As explained in detail in my previous testimony, I believe that this area of
7 Vermont has a long established land use pattern as a working landscape that reflects
8 both the traditions of the residents and the resources present on the land. Extensive
9 timber harvesting, hydropower, agriculture and mineral extraction have been
10 ongoing in this area for over a century. This area is not a pristine landscape, although
11 newcomers in particular, drawn to Vermont's scenic yet "working" landscape, do
12 have a somewhat idealized view of this landscape as a static environment. The
13 Northeast Kingdom has changed, along with the rest of Vermont, and the influx of
14 new residents along with the attendant infrastructure has actually been the most
15 dramatic factor contributing to the recent changes. The Interstate is an example of
16 the changing infrastructure. This landscape will continue to change with the direct
17 and secondary growth spurred on by developments such as what is proposed at
18 Burke Mountain, as well as with agricultural fields returning to forest. We thus need
19 to view our landscape with an eye towards understanding and accommodating these
20 changes over time. The nature of this landscape, with its topography, forests, fields
21 and lakes, as well as its many hills, ridges and mountains, can accommodate this
22 change where and as appropriate.

1 It is also important to point out that Vermont mountains and ridges have
2 historically been developed in a variety of ways, further dispelling the claim that our
3 ridges and summits are “pristine”. What some may find to be a surprising number of
4 Vermont’s ridgetops and mountains have been developed over time for commercial
5 or recreational purposes, including most recently for telecommunication towers. The
6 accompanying ***Exhibit UPC-DR-Reb2***, Mountaintop Development Inventory,
7 provides a partial listing of illustrative current and past mountain and summit
8 development, and does not even touch upon timber harvesting activity. The ridge of
9 Glebe Mountain, for example, formerly proposed as the site for a windpower
10 project, has an Act 250 permit in place for timber harvesting, has 2 ski areas on
11 either side of it, and hosts a telecommunication tower. We use our mountains, we do
12 not just look at them. One could easily argue that the visual and environmental
13 impacts of our ski areas are much greater and more visible than those of a wind
14 energy project, but because we are accustomed to these impacts, we accept them and
15 would not readily conclude that they create an undue adverse impact on scenic
16 beauty.

17 2. Compatibility of Design with Surroundings.

18 It is true that utility scale wind turbines present a unique form and land use
19 type that cannot be readily hidden in a landscape given the need to site them in
20 locations with viable wind resources. Yet it is critical to understand that wind
21 turbines and their rotors represent a form that is not massive and does not require a
22 large footprint. The height is an issue, of course, but the compatibility of these
23 projects with their surroundings can be judged by 1) the manner in which they have

1 been sited, along contours and in groupings, and 2) the fact that their forms are
2 slender and refined and primarily experienced from a distance that allows them to be
3 seen at a scale that is not overwhelming. It is also important to note that the white
4 tower color allows the form to often blend with the background sky – as Mr.
5 Dodson himself has noted in testimony to this Board – and the sky is cloudy on
6 almost half of the days of the year, with the probability of precipitation on 27% of
7 the days of the year.

8 A project’s fit with existing road and utility infrastructure on the site is
9 another important aspect of compatibility. The road network serving the proposed
10 turbines will be constructed partially on already existing logging roads, and a VELCO
11 transmission corridor runs through the project site. These factors provide a measure
12 of compatibility as well.

13 3. Suitability of Colors and Materials to Surroundings.

14 The colors of the turbines and the rotors will be white, which has been
15 determined to be a suitable color that blends well with the background sky. The
16 turbine structures are tubular steel plate construction and the tower, blade, and
17 nacelle fabrication reflect current wind energy technology and standards. The
18 physical footprint of the tower structure itself at 14’-6” diameter is much smaller
19 than even a modest residence. The monopole design eliminates the need for guy
20 wires and associated anchors and clearing, thereby minimizing impacts on the
21 ground and reducing disturbance of surrounding wooded areas.

22 4. Visibility of the Project.

1 The visibility of the project was limited with the original proposal and turbine
2 configuration, and is even more limited with the new proposed configuration. We
3 have developed new exhibits to reflect the change in the project design and layout.
4 The revised viewshed map (**Exhibit UPC-DR-Reb3** Area of Potential Visibility
5 Revised Turbine Layout) continues to demonstrate that a small fraction of the
6 viewshed will have potential views of the facility. About 4% of the revised 10-mile
7 radius viewshed will have potential views of one or more turbines (and that view
8 could be only of a portion of one rotor or it could be of all 16 turbines). The limited
9 visibility is due to the varied topography of the area and the presence of extensive
10 tree cover, both of which are limiting factors with regard to visibility. The Forest
11 Cover map (**Exhibit UPC-DR-Reb3**) demonstrates the extensive forest cover in
12 the area, which significantly reduces the visibility of the project. I discussed
13 previously some of the issues related to trees and tree cover and visibility.

14 We have been criticized for omitting “numerous” viewing points from our
15 analysis. We did not and cannot survey every possible view, however limited the
16 viewshed. We focused on known and important public viewing points as well as
17 primary roads, state and interstate routes. We did not and could not sample views
18 from private properties or roads. We provided an assessment that is consistent with
19 what the Quechee Analysis requires, and precedent in Act 250 cases has established
20 that the Quechee test is not intended to guarantee that 1) a view will remain the same
21 or 2) views from private residences and properties will be protected. Nonetheless,
22 we believe Attachment 9 in Exhibit UPC-DR-2 represents a reasonable survey of
23 possible viewing locations where members of the public are likely to congregate, with

1 119 locations reviewed. The inventory developed for Exhibit UPC-DR-2
2 Attachment 10 – The View from the Road, provides additional inventory
3 information with regard to potential visibility.

4 It is also important to recognize that the view from the road is a moving
5 view, and that visibility of the proposed project will typically be for brief windows
6 due to the intermittent wooded areas prevalent along the roads in the region, and of
7 short duration due to the speed of the vehicle. For example, along Interstate 91, the
8 view duration is measured in seconds, not minutes, and the traveling speed is
9 typically 65 mph. In this context, we believe the sight, at one point, of 6 turbines
10 (and some of the rotors of another 7) at various heights will intrigue and engage the
11 viewer, rather than shock them. Of relevance to the whole issue of roadside viewing
12 is the fact that the Route 9/Molly Stark Scenic Byway Management Plan lists the
13 Searsburg Windpower project as a “scenic resource,” in recognition of the fact that
14 there is an interest in and an attraction to windpower development as part of our
15 evolving landscape.

16 Finally, it must be acknowledged that views of this project and the nature of
17 the view will vary greatly with distance, weather, context, and activity. Thus, visibility
18 of the Project cannot be evaluated simply on the basis of whether you can see it or
19 not from a given location, and the assumption that if you can, then there is an
20 impact. Many views of the turbines will be in the background, very distant, or just
21 partial views, and in these circumstances, the turbines may be hardly noticeable. This
22 factor must be recognized when evaluating overall visibility. Furthermore, it has been

1 established that some viewers appreciate the sight of wind turbines, some are
2 ambivalent and some do not want to see them at all.

3 5. Impact of the Project on Open Space.

4 As stated in my original testimony, this project will cause minimal impacts to
5 open space. The Project as redesigned has even smaller impacts on open space than
6 the Project as originally conceived, and has no physical impacts on public open space
7 other than visibility at a distance from public vantage points. The presence of the
8 turbines will not restrict the use of the lands they are located on for any of the
9 activities that have been ongoing. The clearing of 2.25 to 2.75 acres typical for the
10 individual sites will change the nature of those areas, but not in a manner that will be
11 visible or deleterious to the overall use and resource management of the open space.

12

13 **Q. Mr. Dodson and Mr. Jewell contend that consideration of Vermont's**
14 **changing landscape in application of the Quechee test would open the door to**
15 **almost any large-scale development in rural areas. Do you have a response?**

16 Response. I do not believe this to be the case. First, note that we are only talking
17 about aesthetics analysis under section 248, which applies to a small subset of
18 development projects in Vermont – those related to power generation and
19 transmission. In deciding on these projects, the Board is specifically required to
20 consider the greater public good as it makes decisions that implement state energy
21 policy and ensure Vermont's energy future. These considerations are not part of the
22 Act 250 decision-making process. In considering aesthetics in light of a project's
23 social utility under Section 248, I think it is appropriate for the Board to consider the

1 Vermont landscape as it has evolved and functioned over time and is likely to
2 continue to evolve and function. This would not automatically result in acceptance
3 of large-scale utility projects, or their inevitability, but rather would provide a more
4 meaningful context for the Board to decide if impacts to the landscape from a
5 proposed project should be tolerated because of the greater public good. As it is, in
6 Section 248 cases the Board considers the Quechee Test in concert with other
7 factors, and its decisions have reflected a balancing of the costs and benefits of the
8 project as it relates to aesthetics and the overall public need or public good.

9

10 **Q. With respect to consideration of the second prong of the Quechee test, what**
11 **are your points of disagreement with Mr. Dodson, Mr. Brown, Mr. Michaud, Mr.**
12 **McCue, Mr. Jewell, Mr. Kane, and Mr. Ide.**

13 Response. We disagree on several points.

14 1. Would the project violate a clear, written community standard?

15 The key documents in question are the Regional Plan and the Sutton Town
16 Plan. Both documents have been revised in specific response to either this project or
17 one other wind power facility which was proposed for the region. The Sutton
18 Zoning Ordinance has been mentioned, but it cannot specifically eliminate or
19 completely “zone out” a public utility and thus its application is limited. The new
20 Regional Plan provides guidance with regard to commercial wind facilities and some
21 general statements about scenic beauty, but no standards that would preclude or
22 prohibit these types of projects.

1 The Department of Public Service’s own consultant, Mark Kane, concluded,
2 as we did, that there were no elements or language in either the Sutton Town Plan or
3 the Regional Plan that constituted a clearly written community standard.

4 The analysis presented in my initial testimony is still valid with regard to the
5 Sutton Town Plan and its inconsistencies. I would point out several issues, however.
6 The Town Plan states that it “strongly discourages erection of wind towers on lands
7 above 2000 feet” but does not prohibit them. The blanket delineation of “scenic
8 protection areas” as all areas above 2000 feet carries with it no specifics or criteria as
9 to the quality of the scenery and the basis for designation, and contradicts the
10 provision that allows development up to 100 feet in height. This is not a clear
11 standard.

12 The recently adopted NVDA Regional Plan eliminated overt support for
13 wind energy projects but did not state that wind energy projects are prohibited in the
14 region. In fact, it does state that “wind energy needs to be considered a resource to
15 meet some of our current and future needs” (p. 39). The Plan offers guidelines for
16 the PSB in evaluating proposed wind power developments, and these guidelines
17 provide a framework for addressing concerns of the RPC relating to such projects.
18 Therefore, the new plan actually recognizes and envisions that windfarms may be
19 built in the region. Its language cannot reasonably be interpreted as a clear
20 community standard designed to bar windfarms from the region in order to preserve
21 its scenic beauty. The Plan does include a statement that significant historic, cultural
22 and scenic resources within the region should be identified and preserved (page 78),
23 but does not identify such resources or criteria for evaluation or preservation, which

1 is appropriate since the plan is a high-level regional planning document, intended
2 primarily to guide the planning efforts of communities in the region. In summary,
3 the Plan provides advisory language and some criteria for the Board to consider
4 regarding commercial scale wind projects, but no specific standards which this
5 project would violate.

6 2. Would the Project appear shocking and offensive to the average person?

7 We need to revisit the definition of an “average person” for purposes of
8 determining the public’s likely response to the appearance of the proposed facility.
9 The Random House Unabridged Dictionary of the English Language defines average
10 as “the norm, or mean”, or “typical, common, ordinary.”

11 As the Board recognized ten years ago in its decision approving the
12 Searsburg wind facility, “average persons” cannot include individuals with atypical
13 sensitivities to the proposed facility due to their personal circumstances, or unusual
14 emotional makeup. These include individuals who live very close to the facility, and
15 are therefore concerned with impacts to their private property that differ from
16 impacts to public viewing sites. These also include people with an atypical fear of
17 change in the landscape of any kind. Certainly, the voice of opponents to this
18 project, while certainly reflecting strongly-held and often emotional views, does not
19 necessarily represent the voice of the average person.

20 The principal question the Board must answer in determining whether the
21 proposed facility will shock or offend the average person is whether it will
22 substantially diminish the scenic qualities of the area. It is my opinion that it will not
23 have this effect, based on the analysis explained in detail in my previous testimony.

1 “Average persons” will view this project from public viewing areas, the
2 majority of which are at a distance from the Project such that the turbines will
3 neither dominate nor substantially diminish the scenic quality of the view from these
4 locations. The landscape in which the turbines will be located includes visual
5 elements of a working, rural residential landscape that has changed over time with
6 the addition of major new infrastructure such as the Interstate. I note that the
7 Project will have minimal impact in terms of roads and clearing, comparable to or
8 less than what would be associated with a typical logging operation.

9 On the subject of the prominence of the turbines in the landscape, Mr.
10 Brown has produced a misleading exhibit, RPB-2, representing a turbine next to a
11 public building in the same scale. The public will never view the turbines in this
12 context. Again, while the turbines are large-scale structures, they will be located at a
13 distance from most other structures, and typically viewed from a significant distance.
14 Thus, the scale relationship presented by Mr. Brown fuels a misconception about
15 how the turbines will appear in the landscape. As demonstrated in the Searsburg
16 evaluation that I discussed in my previous testimony, once the turbines are in place,
17 it is likely that many opponents will find them less visually intrusive than they had
18 imagined, and will be able to accept them.

19 Finally, I note that wind power generation is fairly new to Vermont. It is my
20 opinion, and was that of the Board in its decision approving the Searsburg wind
21 facility, that whether a viewer is shocked and offended by wind turbines is
22 significantly dependent on that person’s attitude concerning the benefits of electricity
23 generation from renewable resources, and from wind in particular. A person who

1 appreciates these benefits is less likely to find the turbines aesthetically shocking and
2 offensive. Public education regarding the benefits of wind power will therefore
3 mitigate the aesthetic impact of this project.

4 3. Has UPC taken all available and reasonable steps to mitigate impacts?

5 As discussed in my original testimony, I do believe that UPC has taken all
6 reasonable and available steps to mitigate impacts and indeed, has demonstrated a
7 willingness to refine the project and improve it so as to reduce or eliminate impacts.

8

9 **Modification to Project**

10 **Q. As stated in the Cowan et al rebuttal testimony, UPC has presented a revised**
11 **project layout to address a number of concerns raised. What effect will these**
12 **changes have on the potential for visibility?**

13 Response. UPC has reduced the project from 26 turbines to 16 turbines, and
14 removed all but 2 turbines from Norris Mountain in Sutton. All 6 turbines have been
15 removed from Hardscrabble Mountain as well. Access to the Project has changed
16 from Dareios Road to an access point coming from the west on New Duck Pond
17 Road. The turbine type has also changed; the new turbines are manufactured by
18 Clipper Windpower with a 2.5 megawatt generating capability. The dimensions have
19 also changed somewhat from the originally proposed Gamesa turbines. The overall
20 height from ground plane to the tip of a vertical blade or rotor will be 128 meters
21 (about 420 feet) compared to the Gamesa turbine height of 121.5 meters (about 399
22 feet). When compared to the Gamesa G87, the Clipper C96 nacelle is considerably
23 smaller and the tower is more slender.

1

2 **Q. Will these modifications reduce the visibility of the turbines, or otherwise**
3 **reduce the potential impacts of the proposed Project? Please explain.**

4 Response. I believe they will reduce the visibility of the turbines substantially from
5 certain viewing points.

6 Crystal Lake

7 The relocation of 4 of the turbines in the northern array will reduce the visual
8 impact of the Project as seen from Crystal Lake by providing a break in the array
9 when viewed from the beach area. Some of the turbines have been placed lower in
10 elevation or in different locations, thereby reducing their apparent height. This has
11 the effect of creating more variability and improving the “fit” with the landscape.

12 King George School

13 The revised layout significantly reduces the visibility of the Project from the
14 King George School. Due to the elimination of all of the turbines from Hardscrabble
15 Mountain, turbines will no longer be visible in the southerly views from the front of
16 the school buildings (although noted in my report, the principal views from this
17 property are really towards the valley to the southeast). The views of the turbines
18 north of the school are limited, with the closest turbine 1-1/2 miles distant. Mr.
19 Kane stated in response to discovery that the Department of Public Service has
20 concluded that turbines on the northern array are not unduly adverse with respect to
21 views from the King George School due to their limited visibility. Given these
22 factors and given that the orientation and focus of the school’s panorama is more to

1 the south and east, the visibility of these turbines will not result in an undue adverse
2 impact.

3 Other Locations

4 The removal of the Hardscrabble Mountain turbines completely eliminates
5 any visibility of the project from the nearby local roads, in particular Berry Hill Road
6 and Gold Mine Road. In addition, there is now almost no visibility of the turbines
7 from the Miller's Run School in Sheffield. In almost every viewpoint from which we
8 presented simulated views in my original testimony, the visual impacts of the
9 turbines have been reduced significantly. This is because the array is more compact
10 and clustered with the new layout, and because the visible extent of the Project has
11 been reduced by almost a third. The new layout and a smaller number of turbines
12 reduces the overall presence and visibility of the project. See Revised Layout
13 Simulations and Comparison of Original and Revised Layout Simulations in
14 ***Exhibit-UPC-DR-Reb4***

15

16 **Q. Have you prepared revised photo simulations representing the visual impact**
17 **of the modified Project?**

18 Response. Yes, we have. A number of the simulations have also been checked with
19 line of sight sections to ensure accuracy. This method is the best way to test the
20 visibility of certain objects from any one vantage point. In the authoritative
21 publication *Visual Simulation*, the author states "Some basic tools exist that can be
22 used...to check simulation accuracy. An example is the use of accurately drawn cross-
23 sections...Such line of sight profiles can resolve questions of accuracy in the position

1 of objects in the up-down dimension and depth in the picture, as well as relative
2 height.” (Steven R. J. Sheppard, Van Nostrand Reinhold, New York, p.135). The
3 simulations support my analysis and the conclusions reached in this testimony. The
4 revised simulations are shown in ***Exhibit UPC-DR-Reb4a-1***

5

6 **Q. Please describe the impact of these modifications on your evaluation of the**
7 **proposed project under the Quechee test.**

8 Response. These modifications improve the Project and reduce both the visibility of
9 the Project and related impacts from project construction, such as the number of
10 areas that will require clearing for turbine sites. My conclusions with regard to the
11 Quechee Analysis are unchanged, and in fact strengthened. The applicant has
12 worked hard to take steps to address concerns expressed by some parties in this case,
13 and those steps further reduce perceived impacts. The Project visibility has been
14 reduced or eliminated in key locations that are considered sensitive, and the
15 appearance of the Project has been improved and impacts reduced with the
16 elimination of 10 turbines.

17

18 **Crystal Lake**

19 **Q. Mr. Dodson claims that you inaccurately imply that Crystal Lake Park is**
20 **already visually compromised when, in fact, it is fairly pristine. Do you have a**
21 **response?**

22 Response. Mr. Dodson may not have read my report completely; on page 12, I
23 provide the standard dictionary definition of pristine which includes “remaining in a

1 pure state...or uncorrupted or untouched by civilization.” Crystal Lake is not
2 pristine. It has a park with a parking lot, structures and man-made elements which
3 have altered the natural state of the lakeshore; it has camps, a railroad and state
4 highway adjacent to it, and its shores were quarried for granite. This has not left
5 Crystal Lake and its environs in a pristine state.

6

7 **Q. Do you agree with other witnesses that Crystal Lake State Park is a popular**
8 **place to recreate primarily due to the view from the bathhouse and the beach, and**
9 **that this view will be significantly impaired by the Project?**

10 Response. No, I do not. I believe that Crystal Lake is popular for recreation because
11 of the facilities and the beach, not because of the view. We have spent a lot of time
12 considering the Crystal Lake view and possible impacts from this project, and I can
13 reaffirm several key conclusions: 1) Crystal Lake does not offer the level of scenic
14 beauty that Lake Willoughby, for example, provides, and people do go to Lake
15 Willoughby for the view; 2) the distance of the turbines from the park and their form
16 in the landscape reduce their “presence” and/or potential for distraction and thus
17 their visual impact; and 3) there are foreground views, elements and activities which
18 are more of a focus for park users than the distant view of the hills. These factors
19 combine to make the visual impacts acceptable, and neither undue nor a significant
20 impairment to the viewshed.

21 Crystal Lake is a typically scenic lake, but not one that is of extraordinary
22 beauty. There are many lakes in Vermont surrounded by hills and with long distance
23 views - Vermont as a whole is scenic, but we must distinguish between those scenic

1 areas that are of outstanding, exceptional or unique beauty, and those that are part of
2 the typical Vermont landscape and are not unique or highly sensitive. I believe
3 Crystal Lake is not a unique or highly sensitive location. It is a place people go to
4 recreate because there are facilities there and an amenable beach – that, as opposed
5 to the view, is the attraction and the focus. The view supplements and enhances the
6 experience but is not necessary to the enjoyment of the lake and the park facilities.
7 Furthermore, it is not a location that has been identified as having a critical or
8 sensitive viewshed that cannot or should not be subject to changes in the landscape.

9

10 **Q. UPC witness Liz Pritchett has identified eleven potentially historic camp**
11 **properties on Crystal Lake. Please describe the location of these properties relative**
12 **to the proposed facility.**

13 Response. Most of these camps are located on the easterly and westerly shores of
14 the lake with an orientation and focus towards the lake, its western or eastern shores,
15 and the landscape beyond. The views in a southerly direction down the lake towards
16 the site of the proposed facility are not the primary views from these camps. Due to
17 topography and the orientation of this section of the lakeshore, some of these camps
18 will have little, if any, view of the proposed facility. Two camps are located on the
19 north shore, but at a distance from the proposed facility site of at least 4 miles.
20 Viewed from this distance, as from the Crystal Lake beach and bathhouse, the
21 presence and visual impact of the turbines will not be so great as to significantly
22 impair the viewshed.

23

1 **Q. Do you think the proposed facility will significantly impair the view from any**
2 **of the eleven potentially historic camp properties?**

3 Response. Based on the foregoing conclusions, I do not believe the view will be
4 significantly impaired nor will the presence of the facility undermine the historic
5 integrity of these sites and structures.

6

7 **Orderly Development of the Region**

8 **Q. Mr. Jewell and Mr. Ide variously contend that the proposed project will**
9 **unduly interfere with the orderly development of the region because it is inconsistent**
10 **with the Sutton Town Plan and the Regional Plan, or because of its possible impact**
11 **on the King George School. Do you have a response?**

12 Response. I do not believe that the Project will unduly interfere with the orderly
13 development of the region, and in fact, it may support orderly development by
14 providing a local source of power. Our original report addresses the inconsistencies
15 in the Sutton Town Plan and concludes that both the Sutton Town Plan and the
16 Regional Plan state generalities, which provide neither a clear written community
17 standard on protection of scenic beauty nor a clear standard for orderly development
18 that can ultimately guide us on this issue. In Mr. Ide's own response to discovery, he
19 admits that the Regional and Sutton plans do not prohibit commercial wind
20 development. He further concedes that planning documents provide only a guide to
21 the consideration of land uses and potential development activities. If planning
22 documents are only guides, then they cannot in any instance provide specific, clearly
23 written community standards, and even if activities are deemed inconsistent with

1 planning documents, they would not inevitably interfere with the orderly
2 development of the region.

3 Concerning the Project's impact specifically on the King George School, Mr.
4 Ide and others have stated that the school might potentially close if the Project is
5 constructed. This contention is not based on any proven study or other evidence of
6 what impact a view of several turbines will have on the students of the school. In
7 fact, wind power projects have an educational value and this is underlined by the
8 presence of wind turbines at public schools such as the Danville School and the
9 Addison Elementary School (And at UVM for some time). These turbines are
10 smaller than those proposed for this project, but they are placed in very close
11 proximity to the school buildings (next to the playgrounds), and are quite tall in scale
12 relative to the buildings.

13

14 **Q. Mr. Dodson and Mr. Brown suggest that you are biased in favor of wind**
15 **development, and that this bias has compromised your ability to evaluate the**
16 **proposed Project. Do you have a response?**

17 Response. First of all, the fact that I have provided aesthetic assessments for several
18 wind projects does not automatically demonstrate that I have a bias. When I
19 reviewed the Searsburg Proposal for the Vermont Department of Public Service, I
20 had a healthy skepticism as to its impacts, including both the visual (viewshed) and
21 environmental impacts (construction and clearing in an upland, forested location
22 with thin soils). I did not approach the project with a predilection or conclusion.

1 Secondly, I believe one of the critical elements in a successful wind project
2 proposal is site selection, and locating projects where a number of favorable factors
3 are present, which is consistent with the findings and recommendations of Wind
4 Energy Planning Resources for Utility Scale Systems in Vermont - A Product of the
5 Wind Siting Consensus Building Project, as prepared by the Vermont Department of
6 Public Service, 2002 Appendix 1. Thus, before I agree to assist with a project, I
7 evaluate the proposal, the location and the potential impacts and whether certain
8 criteria are being met before I can agree to work on behalf of the proposal. I have
9 been asked to evaluate wind projects for opponents to a proposed project, and have
10 counseled them as I would those in favor – evaluate the facts, the site, the impacts
11 and then determine where the critical issues or unacceptable elements are. I would
12 work for opponents to evaluate a wind project if it were not in an appropriate
13 location.

14 Thirdly, I have nothing to gain or lose personally if the Project is approved
15 or rejected.

16 Finally, like so many of the opponents to this particular project and others, I,
17 too, prefer that Vermont not change, and that its landscape remain the same as it was
18 when I first came to Vermont as a child and fell in love with its landscape. But since
19 that time, Interstates have been built, most of the farms have disappeared, ski areas
20 have become huge resorts and subdivisions have marched over that very same
21 landscape. The landscape changes with forces that our culture and interests set into
22 play. As surely as VELCO builds higher capacity transmission to serve our collective
23 demands for power, so it is that we will be considering alternative forms of power

1 generation as the 21st century unfolds. The landscape architect's role in this is to
2 support those efforts where appropriate, and/or work to accommodate these
3 developments as best as is possible in our changing landscape. That is not my bias,
4 that is my job.

5

6 **Q. Does this conclude your testimony at this time?**

7 Response. Yes it does.