1 2		TCC Supplemental Testimony Dean Apostol	
3		EAII-5105_5	
4	BEFORE THE STAT	F OF WASHINGTON	
5	ENERGY FACILITY SITING EVALUATION COUNCIL		
6			
7	In the Matter of the Application of:	DOCKET NO. EF-210011	
8	Scout Clean Energy, LLC, for Horse Heaven Wind Farm, LLC,	SUPPLEMENTAL TESTIMONY OF TCC WITNESS DEAN APOSTOL	
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12	Supplemental Testimony		
12	Barized 0/1/2023		
13	Revised 9/1/2025		
14	Dean Apostol		
15	The following includes additional information that responds to issues raised at the adjudication		
16	session on August 24. Questions came up from	the EFSEC Advisory Panel covering three	
17	areas:		
18	 What is the value of scenery to people? What are appropriate public outreach approaches to determine community scenic 		
19	values, including BIPOC communities?		
20	5. what are possible mitigation or impact reduction/avoidance strategies that could lesser visual impacts of the HHH project?		
21			
22	Value of scenery		
23	Much research has been done on the many valu	es of scenic landscapes to people. Numerous	
24	research studies have documented positive reac	tions in people viewing scenic landscapes, or	
25	while out in nature. While it may be obvious that	at people value scenic views, it may not be	
26	obvious why. But a reasonable summary is that it makes people feel better physically and		
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mentally. It relaxes them, lowers blood pressure, lowers stress, improves vitality, and even helps in healing.

People make significant efforts, and go to great expense, to visit scenic landscapes. Grand Canyon, Yosemite, the Rockies, Yellowstone, Mt Rainier, Mt Hood, the San Juan Islands, the Columbia Gorge, and the Oregon Coast are some examples. These are our most outstanding landscapes, and they are often protected by federal or state governments. They usually exhibit some combination of complex land form, water, natural vegetation, seasonal colors, harmonious cultural features, and often afford panoramic large scale views. People take photos and share them with friends, though the photos rarely can capture the scale and grandeur. Other landscapes are attractive, containing some, but fewer of the elements listed above. They are important close to home views for many people. Some regional examples include; Forest Park in Portland, the Blue Mountains, (Southwest Washington), parts of the Willamette Valley, the Sierra foothills, and Southern Puget Sound. These are locally or regionally important, but often times are unprotected, or only partially protected. The Horse Heaven Hills fits into this category. They are an important part of local identity. People enjoy these areas day to day, but might not travel far to experience them.

A third tier of landscapes are sometimes called "ordinary", or common. Usually they have low lying or level terrain, lack large water bodies, and may be more agricultural than natural. They often have some scenic value based mainly on their undeveloped condition, but because there are a lot of similar landscapes, little effort is made to protect them. They are taken for granted. Local people may object to development or change, but may have difficulty gaining allies unless there are other values, such as wildlife, wetlands, or archeological sites. Because the Horse Heaven Hills are locally important for scenic values, proposals to develop them with renewable energy should respect them and make an effort to avoid, minimize, or

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mitigate visual impacts. If this is not done, an important source of well being will be lost or compromised, with hidden costs that may not be readily apparent or easy to calculate.

Sample References on the Value of Scenery

Lothian, Andrew. 2017. "*The Science of Scenery*." Available Through Amazon Books. This book includes a comprehensive account of scenery, and scenic beauty. It takes a scientific approach, meaning an objective way of understanding scenery and scenic values. It includes chapters on how humans view scenic beauty, including as art, as travelers, as economic value, for its health benefits. Chapter 13 is "*The Doctor's Eye: Restorative and Health Benefits of Landscape*." This chapter cites and describes hundreds of studies that show that views of nature or natural areas have multiple health benefits to people: reduced stress, reduced blood pressure, greater sense of relaxation, tranquility, happiness, vitality, more rapid restoration from mental fatigue, faster recovery from illness, lower levels of aggression, fewer stress related illnesses, better overall health.

Dr Lothian maintains a web site with valuable information, references, and links on this topic. https://scenicsolutions.world/

Kaplan, Stephen. September 1995. *The Restorative Benefits of Nature. Journal of Environmental Psychology*. Volume 15, Issue 3. Pages 169-182.

Kaplan's theory is that viewing natural scenes improves health due to "Attention Restoration Theory." People spend our days focused on completing tasks, which leads to mental exhaustion, which can be remedied by spending time observing or being in a natural setting.
Aesthetically pleasing environments are restorative. They engage us and hold our attention effortlessly. The Horse Heaven Hills, because they are so visible from such a large part of the Tri Cities area, probably does this for many people, at little or no cost.

Hyunju Jo, Chorong Song, and Yoshifumi Miyazaki. 2019. Physiological Benefits of Viewing Nature: A Systematic Review of Indoor Experiments. International Journal of Environmental

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1	Research and Public Health. On line publication.
2	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6926748/
3	This paper is a review of the results of 37 articles that present evidence of positive
4	physiological effects of viewing nature and natural scenes. Accumulation of scientific evidence
5	of the physiological relaxation associated with viewing elements of nature are useful for
6	preventive medicine by providing nature therapy.
7	Kate E. Lee, Kathryn JH Williams, Leisa D Sargent, Nicholas SG Williams, Katherine A
8	Johnson. 2015. 40 Second Green Roof Views Sustain Attention. Journal of Environmental
9	Psychology, Vol 42, June 2015, pp 182-189.
10	This study found that micro breaks (a few minutes) viewing a flowering green ecoroof boosts
11	sustained attention, results in fewer cognitive errors, improves response to tasks.
12	Seresinhe, Canuki Illushka, Tobias Preis, & Helen Susannah Moat. 2015. <i>Quantifying the</i>
13	Impact of Scenic Environments on Health. In Scientific Reports.
14	www.nature.com/scientificreports
15	This study used data from "Scenic or Not," a British website that crowd-sources ratings of
16	"scenicness" for geotagged photographs across Great Britain, and combined this with reported
17	health from the Census for England and Wales. The results provide evidence that the aesthetics
18	of the environment may have quantifiable consequences for well being.
19	White, Mathew P., et al. 2019. Spending at least 120 Minutes a Week in Nature is Associated
20	with Good Health and Well Being. Scientific Reports. PDF. June 2019.
21	Ulrich, Roger S. 1979. Visual Landscapes and psychological well-being. Landscape Research.
22	Volume 4. 1979.
23	Dr Ulrich did pioneering research in the health benefits of natural scenery. He showed how
24	individuals feel significantly better after visual exposure to natural scenes compared to those
25	dominated by urban elements. Views of nature increased "positive affect" reduced fear
26	

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arousal, and production of pleasurable feelings. In other research Ulrich showed how viewing nature aided in healing. Ulrich says people "feel" positive emotions about natural scenes before we rationalize them. His work influenced the development of "healing gardens" in the health care industry.

Community Outreach

A second question that came up during my oral testimony was about what can or should be done to improve community outreach on the Horse Heaven Hills project, in particular to the BIPOC community of the Tri Cities area. I had made the observation in written testimony that Scout Energy did not appear to have done much with respect to asking the community to help identify key viewing areas. Additionally, they do not appear to have asked people what they value about the Horse Heaven Hills, or how they feel about how the project impacts them, except through standard input channels required by EFSEC.

In my book, The Renewable Energy Landscape (Routledge Press 2016) Chapter 10 (Richard Smardon and James Palmer) addresses the question of engaging communities in siting and designing renewable energy projects. They argue that participatory processes are essential components in the success of siting renewable projects. Key factors include; participation in planning, trust and confidence in the developers and decision makers, equity of impacts, and economic benefits. Various participatory processes are explained and applied. While most people in the USA and elsewhere generally support renewable energy, including wind, there are widespread concerns about landscape impacts. In some countries, like Great Britain, new land based wind projects have all but been abandoned in favor of offshore. And regarding offshore, the public is telling developers and the government to get projects as far offshore as possible. If possible get projects over the horizon.

In Australia, a comprehensive study was done by Andrew Lothian to try and determine where to site wind projects to reduce visual impacts. This study asked people what landscapes they

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most valued, and showed images of them with wind development. It showed that people care most about landscapes (and seascapes) they consider to be scenic. The loss of scenic quality after wind was added was significant. There was much less concern about developing wind on less scenic, mostly agricultural lands, with little or no loss of scenic value after adding wind. People and communities get very frustrated when public involvement is or is perceived to be "token." That is, if the community is given no genuine opportunity to say what is of value to them, or to affect the siting or design of the project, then people become dissatisfied, as should be expected.

In 1969, in the days before public involvement was a legal requirement for many large projects, the social scientist Sherry Arnstiein described a "ladder of public participation, which looks like the image below: Arnstein's Ladder (1969)

Degrees of Citizen Participation

Number one and two, at the bottom, are called "manipulation" and "therapy." A plan is presented. It is said by its proponents to be great. A public relations campaign tries to sell the project. There is no meaningful opportunity for input, though there may be some pretense of input. "Informing," a bit higher up, is when a community is told about a project, but as a one way flow of information. This project is coming to you, like it or not. Nothing you can do about it, but we thought you might want to know. Consultation and Placation are the next levels up. A larger effort may be made to solicit input. But any input that actually challenges the project, or tries to substantively alter it are rejected out of hand. People are consulted, but what they have to say is not important to the outcome. The level of "Partnership" occurs only if and when there is genuine negotiation. Power over the decision is shared, not held entirely by the project proponent or agency that administers the approval process. Community input meaningfully matters at this level and above.

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To be meaningful, there needs to be genuine outreach, and the community needs to have a chance to express its values and make its case. The design of the turbine layout needs to reflect these values. Up until now it has not. It is simply an optimal capture of wind energy by placing as many turbines as possible within the perimeter of the project area, leaving a few gaps where there are resources that have higher levels of protection than aesthetics (cultural sites, some sensitive habitats, flight paths). A Washington Supreme Court case put it well: "The right to be heard implies the reasonable hope of being needed. Smith v. Skagit County, 75 Wn.2d 715, 741 (1969)

As for how to engage people, the best approach I have seen is to ask them how they want to be engaged, then design outreach around that. Some people will prefer field trips, others face to face meetings, and some will be fine with on line opportunities. The key to success is to listen to what people have to say, and if there is a community consensus around what level of visual protection the Hills should have, then the project should be redesigned to meet that objective.

A Path Towards Effective Mitigation

Questions were raised at the hearing on August 24 regarding visual impact reduction and/or mitigation. It appears the project as designed takes up every, or nearly every possible turbine space available, given other facilities like solar, transmission lines, battery storage, and substations. With the 13 turbine removals Scout proposed in the Moon memo, there remain 231 proposed turbines, arrayed east to west spanning some 25 miles, and north to south in bands that take up about 4 miles.

Both visual assessments; the ASC and the Draft EIS, using different methodologies, conclude that visual impacts will be high from most key viewpoints. Since these viewpoints are presented as "representative," EFSEC should presume that this means high impacts will be widespread, well beyond the viewpoints analyzed. It is important to note that in both cases "high" is the top of the scale, because neither method included a "very high" or "unreasonably

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 Bureau of Energy Management to assess impacts from offshore development beyond three miles distance. My opinion is that "high" understates the visual impacts. The project as proposed, with maximum or near maximum turbine development, should be consider to have unreasonably high visual impacts. The reasons are not hard to understand, but can be summed up as follows: There are tens of thousands of high sensitivity viewers who will view the project from countless viewpoints across the Tri Cities region every day, or nearly every d The Horse Heaven Hills are a high quality, high visibility, and highly valued landscape feature. The distance from the viewers to the turbines is close. The term "Middleground" significantly understates the problem. Robert Sullivan at the Argonne National Lat demonstrated that wind turbines are visually dominant at 10 miles distance. Sometimes more. Height of turbines is a problem. Breadth of the layout compounds the problem. Because the turbines. Visual density is also a problem. From elevated viewpoints, particularly Badger Mountain (VP 5), a popular hiking area, one will see all or most of the layers of turbines, front to back. This introduces a "busyness" to the view, creating a clutter landscape that completely loses its natural qualities. The impacts are somewhat less at the east and west ends of the project, and highes milling inclusion from endersities in the cast and west ends of the project, and highes
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 when viewing from and towards the center. The reason is there are many more turbines in view from more central locations. It is important to reamphasize that the simulations presented to EESEC and the
 It is important to reemphasize that the simulations presented to EFSEC and the public understate the impacts. They will often be viewed at too small of a scale, a lack panoramas, that take in the full view, they lack blade movement (a limitation of a scale).
relying on still photos), lack lighting, lack visible ground disturbance (pad grading, roads, vegetation removal), and many have poor lighting or have that reduces visual
contrast below what it will be in the field.
 The book I co-authored, "The Renewable Energy Landscape (Routledge Press 2016) include chapter, "Improving the Fit of Renewable Energy Projects." It was written to help decision

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makers like EFSEC better understand ways large, commercial wind projects can be improved visually, particularly where visual impact concerns are high.

From the answers to questions at the hearing by Scout's visual impact expert, it is clear that

Scout Energy never asked its visual impact team to produce any alternatives or

mitigation strategies for this project. In our book we state:

"Where conservation of visual resources is desired, energy facilities should be designed to fit

within the land or seascape as much as possible, avoiding wholesale changes that obliterate or

overwhelm desired attributes."

We go on to recommend a set of "Best Practices" that should be applied to all renewable energy projects, as follows:

- Identify and avoid areas of high aesthetic value, including in some cases entire viewsheds. Avoidance means placing a higher value on the landscape aesthetic benefits of some areas over their renewable energy benefits. (i.e. no one would accept wind turbines on the rim of the Grand Canyon).
- Analyze landscape character before designing the project. While Scout Energy's visual impact team did a landscape character analysis, it does not appear that any part of that analysis was used to help design the project or mitigate impacts. It appears likely that the analysis was only done after the project was designed. Design decisions were made, as Mr Poulos testified, based on the parameters of meteorology and engineering, not in response to landscape character.
- Site facilities away from most prominent land features. The character analysis should have identified the most important visual features, where these are located, and how they are viewed. The project should have avoided impacting them. For example, the Horse Heaven Hills ridgeline has high and low points, complex and simple terrain. It is irregular, not uniform. The turbines could have been arranged to maintain the best, most interesting areas by leaving sufficient visual gaps around them.
 - Site new facilities in already disturbed landscapes. The Horse Heaven Hills project includes both cultivated agricultural land and undisturbed sagebrush steppe and grasslands. Visually and ecologically the latter have far higher value. The project could have avoided steppe habitats, which would have the added benefit of avoiding disturbance of archeological sites, wildlife, and recreation areas.
 - **Increase distance to reduce visual dominance**. Distance is a critical factor in the visual impact of wind turbines. In nearly all cases, the farther away, the lower the impact. Large turbines can be visually dominant at 10 miles distance or more. The

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location of this project, adjacent to a large urban area, does not allow for the amount of distance we would normally want. However, there is an opportunity to limit turbines to the greatest distance the site permits, which may reduce impacts at least modestly.

- Locate facilities in less prominent locations and away from focal points. This is similar to what was stated above. It requires that the visual team work hand in hand with the meteorologists and engineers to call out the most visually prominent features and areas and build those into the design.
- Use site specific features to reduce visibility. In some cases turbines can be partially or fully "hidden" from view behind small hills or higher points of the ridgeline. You can see this in the Horse Heaven project by noting that few turbines are visible from Benton City thanks to a high point in the ridgeline and the viewing angle, which hides many turbines that lie behind the ridge. Additional places could be identified that provide topographic screening.
- **Provide visual order and avoid chaos, clutter, and disarray.** Turbines are inherently dominant visual features. Some can be hidden, but many cannot be. This means that the way turbines are seen from key viewing areas is important. If the pattern of turbines appears chaotic, or cluttered, this adds to the visual impact. And as the (imperfect) simulations from Badger Mountain illustrate, there is a lot of chaos and clutter in the view. Reducing this is crucial to lowering impacts. If turbines can't be moved to less impactful locations, some may need to be removed to reduce this effect.
 - **Break long lines of turbines with open, undeveloped spaces.** The current (take it or leave it) design of 231 turbines creates a visual wall along the ridgeline, east to west, running nearly parallel with the community to the north, with no substantial visual breaks anywhere. Some turbines should be removed from the center part of the project area to open one or more large visual gaps that provide relief from the monotony of turbine after turbine lining up for 25 miles.
 - Have turbines off to one side rather than in the center of the view. Clearly, the existing design does the opposite. Most of the turbines are right smack in the center of the view. It would be far better to have a group of turbines to the east, and one to the west, with a large opening in the center.

The above list shows that there are ways to reduce the visual impacts of this project. The horse Heaven Hills are clearly an important visual feature, and EFSEC should require the applicant to go back to the drawing board. The best approach would be to set a goal that the project can have only "moderate" visual impacts from most viewpoints to the north, in the Tri Cities area. Various alternatives could then be explored. All would most likely involve removing turbines,

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either from the front (northernmost) to back (south), or by creating sufficient visual gaps, and taking turbines off of visually prominent features. A number of iterations are possible. These can be quickly tested using computer visualization technology.

We offer EXH-5106_S as an illustration of a redesign that follows the principles listed **above**. This uses the map from the Moon Memo and includes views from the Badger Mountain area. Turbines are removed from the central part of the project area, leaving two large clusters, one to the northwest, and one to the southeast. Because the ridge is highest in the northwest, many of the turbines in this area will be hidden from view, as illustrated in the cross sections provided in EXH-5106_S at pages 3-7. The turbines in the southeast would lie behind the existing Nine Canyon project, adding to turbine visual density in that area, but avoiding less developed areas. All or most of the turbines we leave (approximately 61) will be on already disturbed, cultivated land, thus minimizing habitat and perhaps, cultural resource impacts. There may be other alternatives. There may be ways to allow more turbines, or more solar arrays, in this design. The way to find out is to see what it looks like from representative viewpoints, and analyze the results. My opinion, without further analysis, is that an alternative like this would significantly reduce visual impacts, particularly from the Tri Cities region. Localized impacts, those nearest the remaining turbines, might remain high.

Ultimately it is best for the community to be the judge of the visual impact. By that I mean they should be able to say whether a given alternative sufficiently reduces or mitigates the impact they will have to live with. Failing that, an independent panel of visual resource experts, beholden to EFSEC, not Scout Energy, could be appointed to view alternatives and recommend one or more.

I can't emphasize enough how important it is to get this project right visually (and otherwise). As far as I am aware, this is the first large scale wind project in the United States that lies

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adjacent to a major metropolitan area.¹ If it is done badly it can set the wind industry back by years, as it will be used as an example of what goes wrong when a developer and regulators fail to take account of visual impacts to an important landscape. It could be a black eye that follows wind energy around the country, delaying or stopping projects in many places, at a time when the climate cannot afford this.

Conversely **there is an opportunity to demonstrate how to respond to visual concerns and use design and technology to create a plan that is widely accepted**. People in the Tri Cities can feel they were heard, and that this project, while it will no doubt have some impacts, may be an acceptable compromise. This is doable. Yes, some turbines will need to be removed to make it work. But a project of this scale will still produce significant amounts of renewable energy. EFSEC should seek a balanced solution and give this proposal a chance.

Some additional thoughts (optional)

From the Science of Scenery:

"Regarding community acceptance of wind power schemes, the visual evaluation of the impact of wind power on the values of the landscape is by far the most dominant factor in explaining opposition or support. Type of landscape fully overshadows other attitudinal attributes, as well as other visual and scenic factors such as the design of wind turbines and wind farms, and the number and size of turbines."

- There are considerable uncertainties regarding the planning of wind farms but (Ian) Bishop concluded the following:
- ¹ The visual analysis prepared by EFSEC for the Kittitas Valley wind project in the FEIS: (https://www.efsec.wa.gov/sites/default/files/180298/00021/20070201_3_9_Visual.pdf) recognized the difference between a dense urban community and rural community at page 3.9-1: 3.9.1 Study Methodology Visual Sensitivity Assessment Each of us views the outdoor environment differently based on who we are as individuals. Although visual impacts are challenging to gauge quantitatively, there are some common qualitative characteristics of beautiful (and not-so-beautiful) scenery on which most people can agree. Assessing visual sensitivity involves predicting a general impact on the quality of views from a given viewpoint. A combination of three factors determines how sensitive a landscape scene is: • The number and type of viewers; · The viewing conditions; and • The quality of the view. For example, a dense residential area with unobstructed views of a regionally important and memorable scene would be very 25 sensitive to objects or structures that would impede views. Conversely, a view from a seldom-traveled rural road where motorists have only distant, oblique views of wind turbines in an unremarkable setting would likely qualify as an area of low sensitivity. 26 LAW OFFICES OF J. RICHARD ARAMBURU, PLLC 705 2ND AVE., SUITE 1300 SUPPLEMENTAL TESTIMONY OF TCC WITNESS SEATTLE 98104 Telephone (206) 625-9515 FAX (206) 682-1376 **DEAN APOSTOL - 12** aramburulaw.com

1 2 3 4 5 6 7	 Aesthetic impacts are less the further the viewer is from the turbines (although we have no clear idea of the shape of the distance-impact curve); Contrast with the surroundings and background should be low; Wind farms should not be located in highly valued landscapes; The distribution and design of the turbines should have regard for aesthetic factors such as complexity and continuity; Protected sites should be avoided; Less dissent arises through involvement of the local population in the siting procedure, transparent planning processes, and a high information level; Familiarity with existing small-scale projects is likely to increase later acceptance of further projects. 	
8	Hindmarsh (2010) analyzed the extent of community engagement in wind farm planning in Australia and, not surprisingly, found it inadequate. He suggested:	
9 10 11 12	• "A more promising approach is the collaborative approach, which can also facilitate social mapping of local community qualifications and boundaries about wind farm location alongside technical mapping of wind resources. This is needed to identify the most socially, economically and technically viable locations to locate wind farms to ensure effective renewable energy transitions."	
13	• The prevailing paradox of visual impacts of wind farms is that their benefits accrue to the wider community but the local community bears their dis-benefits.	
14 15	• The crucial issue for wind farm location is their acceptability to the community. What is the threshold level when a wind farm shifts from being acceptable to unacceptable? In a hand book on visual impacts, Buchan (2002) noted:	
16 17 18	• "Ultimately, significant is whatever individuals, people, organizations, institutions, society and/or policy say is significant – it is a human evaluative and subjective judgement on which there may or may not be consensus. It is therefore important that two separate but critical characteristics of all effects – magnitude and significance – are clearly distinguished."	
19	In applying such criteria, the level of landscape quality prior to the development needs to be	
20	considered. The visual impact of a development in a landscape of 4 or 5 rating will be far	
21	less objectionable than a development in a landscape of 6, 7 or especially 8 rating as we	
22	saw in the South Australian inland example above. The thresholds in landscapes of high	
23	quality will be considerably less than the thresholds for landscapes of low quality. A	
24	reduction from 8 to 7 will be far more objectionable than a reduction from 5 to 4. Thus	
25	two factors need to be considered in establishing visual thresholds, firstly the rating of the	
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subject landscape, and secondly, the reduction in landscape quality that results from the development.

*Note: I don't believe the analysis by TetraTech or SWCA rated the Horse Heaven Hills landscape before the developer placed the turbines. I believe that, on a 10 scale, HHH would rate 7-8 for most people. Which means a lowering of visual quality will be objectionable.

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