

Appendix G
NASA's Responses to Comments on the Draft EA

Comment No.	Commenter Name	Commenter Affiliation	Comment	Topic	Response
1	George H. Badger	Virginia Marine Resources Commission	Based upon my review of the "Draft Environmental Assessment (DEA) for the Alternative Energy Project," date March 2010, it would appear that your "Proposed Action and Alternatives" will not fall within the Commission's jurisdiction; therefore, no authorization would be required from the Marine Resources Commission.	Permitting	Comment noted.
2	George H. Badger	Virginia Marine Resources Commission	For your information, however, the Proposed Action would require a wetlands permit from Accomack County for the filling of 0.88 of an acre of tidal wetlands. Alternative 2 to install up to five 2.4 kW wind turbines along with the installation of a system of solar panels at the Main Base and Mainland would appear not to impact tidal wetlands. This alternative would help alleviate our concerns to tidal wetland impacts.	Permitting	Comment noted.
3	Daniel J. Costanzo	Stars Unlimited	In order for this National Aeronautics and Space Administration-Wallops Flight Facility (NASA-WFF) DEA to be complete, NASA must give the public adequate time to review this document, prepare their comments on it, and submit them. Unfortunately, NASA did not give the public adequate time to do so. Instead, for this NASA-WFF DEA document dated 2010 March, the public has been given a comment period window ending only five (5) days after 2010 March's end (i.e., ending on 2010 April 5). The majority of the public was first informed about this DEA document by the news media, along with being informed of this comment period's 2010 April 5 ending date, only on or about 2010 March 28 (e.g., by an article on that date on the Washington Examiner Internet/Web site).	NEPA Process	NASA followed the National Environmental Policy Act (NEPA) requirements for notifying the public of the availability of the DEA by publishing notices in two local papers and posting the EA to the WFF Web site. The start of the public comment period was on March 3, 2010. Although a public meeting is not required for an Environmental Assessment (EA), NASA held one on April 1 to answer questions and provide information directly to the public. Additionally, NASA extended the public comment period from 30 days to 41 days to allow extra time for input after the public meeting; the comment period closed on April 12 instead of April 5. On March 25, 2010, NASA issued a press release to announce the April 1 public meeting; this press release also included the Web site address where the DEA was posted and with instructions on how and when to comment.
4	Daniel J. Costanzo	Stars Unlimited	This comment period included the traditional Springtime Season (March Equinox 2010 through Easter Day 2010) when much of the public was commemorating the March Equinox's arrival through various religious observances. Thus, NASA was soliciting the public's comments on this DEA document during a period of the year when that public is otherwise occupied with priorities higher than reviewing and commenting on what comprises quite substantial documentation (particularly if it has to be reviewed in hardcopy form, and/or in softcopy form on computers with slow Internet/Web access). Therefore, in order for NASA to provide a fair amount of time for the public to provide comments on this DEA, NASA needs to extend this particular public comment period's closing date from 2010 April 5 (Monday) to 2010 June 30 (Wednesday).	NEPA Process	It is NASA policy to allow extra time for review of its NEPA documents if a valid request is submitted from an organization or individual. During the review of the DEA, NASA did not receive such a request aside from the input submitted by the commenter. As the DEA was available for public review for more than 30 days beginning March 3, 2010, extension of the comment period to the end of June 2010 is not warranted. For a detailed description of the means NASA employed for notifying the public of the availability of the DEA, please see the response to Comment #3.
5	Daniel J. Costanzo	Stars Unlimited	Other government agencies – like the National Park Service – always provide on their Internet/Web sites soliciting public comment an e-mail address for the public to send those comments to, along with instructions as to how and when to send them. Unfortunately, no instructions on how the public was to provide comments about this DEA, nor any e-mail address for e-mailing their comments to, could be found in any of the documentation available on NASA's Internet/Web site associated with this DEA, with WFF, or with NASA in general. Instead, all that was given on this DEA regarding "For Further Information" about it was a point-of-contact named Joshua A. Bundick, along with only a snail mail address and only a long distance phone number. And,	NEPA Process	At the start of the public comment period (March 3), NASA provided an email address where comments could be sent in the notices published in two local newspapers (published March 3 and 4) and also on the WFF NEPA Web site (http://sites.wff.nasa.gov/code250/AltEnergy_DEA.html) along with instructions on how and when to send them. On March 25, 2010, NASA issued a press release to announce the April 1 public meeting; this press release also included the Web site address where the DEA was posted and with instructions on how and when to comment. Furthermore, a summary of commenting options and an electronic mail address were provided in Chapter 7 of the document. However, to ensure that it is clear to reviewers where comments may be provided electronically, NASA will provide an electronic mail address on the Cover Sheets of future NEPA documents, including the Final Alternative Energy EA.

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			unfortunately, in order to meet the 2010 April 5 deadline, these comments could only be e-mailed after COB, when Mr. Bundick would have already departed for the day. Because of NASA's lack of guidance on how the public is to comment on this NASA-WFF DEA, these comments have been e-mailed to the two (2) e-mail addresses at NASA-WFF's Office of Public Affairs (one was for Keith A. Koehler, and the other was for Rebecca H. Powell) on 2010 April 5, thus meeting NASA's apparent requirement that the news reports about this NASA-WFF DEA claimed was the date that was the deadline for the public's submitting comments by.		
6	Daniel J. Costanzo	Stars Unlimited	In order for this NASA-WFF DEA to be complete, NASA must adequately incorporate the comments listed below, although with the understanding that had NASA provided adequate time for public comments, that these comments would have been provided in more detailed form. These comments do not duplicate any comments previously made by Stars Unlimited about this NASA-WFF DEA – or any NASA DEA – because this is the first – and so far only – time that Stars Unlimited has commented about this NASA-WFF DEA – or about any NASA DEA.	NEPA Process	NASA must consider all public comments received on a NEPA document; therefore, NASA has considered the comments submitted by Stars Unlimited.
7	Daniel J. Costanzo	Stars Unlimited	NASA – more than any other federal agency – must officially recognize in this NASA-WFF DEA, in all of its other DEAs, and as a matter of official NASA policy, that there is a direct connection between star-filled dark skies free of light pollution and NASA's continued support from American citizens, voters, and taxpayers. In fact, unlike any other federal agency, NASA's "Meatball" agency logo itself prominently features as its background a symbolic star-filled dark sky free of light pollution. (Note: In these comments, "light pollution" does not include the light directly associated from nighttime rocket launches, very high altitude chemical cloud releases by rockets or satellites, balloon launches, reflective glints from satellites launched from NASA-WFF, or aircraft takeoffs and landings associated with NASA-WFF, or any other NASA facilities. Those kinds of light generation are both temporary, welcomed, and encouraged.) Therefore, NASA must officially recognize in this NASA-WFF DEA, in all of its other DEAs, and as a matter of official NASA policy, that in these tenuous times for NASA, that it has a vested interest in fostering the protection of such a pristine feature of the natural physical environment. This recognition needs to include NASA's stating that just as a star-filled dark skies free of light pollution have inspired many to serve with NASA with distinction, unmitigated light pollution, by causing less and less of the American public to experience such star-filled dark skies, needs to be mitigated or even avoided entirely because it will translate into less and less public support for NASA, will be a tremendous waste of energy, and result in other adverse environmental consequences besides light pollution (e.g., increase Global Warming carbon dioxide air pollution, increase species loss, and increase breast cancer rates, to name but a few secondary adverse environmental consequences).	Aesthetics	NASA has updated the EA to address light pollution as a part of the aesthetics analysis of the alternatives. The only source of light emitted under either alternative would be a single red flashing LED (Light Emitting Diode) light that would be placed on top of the utility scale wind turbines. Therefore, neither alternative would cause any noticeable changes to the lighting that already exists on Wallops Island.
8	Daniel J. Costanzo	Stars Unlimited	NASA must incorporate into its NASA-WFF DEA the concepts for designing and building Solar powered facilities emphasized by Paul Westbrook of Texas Instruments, Inc. (TI) based on	Aesthetics	Comment noted. NASA would utilize state-of-the industry standard designs for solar power facilities if the solar panels are constructed.

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			<p>experience gained in his working with TI to design, build, and operate the World's first Solar powered chip/semiconductor manufacturing plant in Dallas, Texas. And this plant is also a Leadership in Energy and Environmental Design (LEED) Gold facility, while adding to TI's profits by reducing operating costs. Over the past several years, TI's Paul Westbrook has given several presentations on this subject at the U.S. Department of Energy's Solar Decathlons held on the National Mall. And he is available for consultation by NASA: Paul Westbrook (Sustainable Development Manager; Senior Member, Technical Staff; LEED AP; International Facilities; TI; Dallas, Texas. TI's Paul Westbrook found that the concept of using a total systems approach worked best for designing, building, and operating the Wallops renewable energy facility as a total system. Most likely, because NASA is NASA, it should be assumed that NASA would be designing, building, and operating this renewable energy facility utilizing a total system approach. However, this NASA-WFF DEA must clearly state that NASA is using a total system approach to doing so TI's Paul Westbrook also helped incorporate into the total system approach for designing, building, and operating the World's first Solar powered chip/semiconductor manufacturing plant the minimizing of light pollution by reducing exterior/outdoor lighting to the minimum necessary as but just another one of the "energy vampires" that TI's require being eliminating as part of making a renewable energy powered facility as energy efficient as possible. NASA needs to do the same for its NASA-WFF facility, and all other NASA facilities, as well as state that it will do so in its NASA-WFF DEA, and in all its other DEAs.</p>		
9	Daniel J. Costanzo	Stars Unlimited	<p>NASA needs to officially state in both this NASA-WFF DEA, and in all of its DEAs, that as part of its efforts to incorporate renewable energy systems, that it will include in its energy efficiency planning the incorporation of all the light pollution avoidance and abatement recommendations of the International Dark-Sky Association (IDA) as a specific, clearly identified component of all external/outdoor lighting policies and practices for all current lighting (including through retrofitting existing lighting) and future outdoor lighting at both NASA-WFF, and at all NASA facilities, which will not compromise safety, security, and utility (compromising them is not a problem as the light at issue is wasted light). IDA can put NASA in touch with knowledgeable experts to assist it in meeting this need while saving taxpayers money. This means that, just like NASA does for other forms of pollution (e.g., the noise pollution addressed in this NASA-WFF DEA), it must also include light pollution as another form of pollution specifically addressed in this NASA-WFF DEA, and start measuring and tracking light pollution in and around NASA-WFF in a quantitative manner through a light pollution monitoring program. This now is possible using relatively low cost, digital Sky Quality Meters (SQMs), with the light pollution level measured and quantified in SQM readings of visual magnitudes per square arc-second. A light pollution-monitoring program could be crafted, organized, and conducted by NASA, at little additional cost to taxpayers, by NASA's utilizing the expertise available from Stars Unlimited. This light pollution monitoring</p>	Aesthetics	<p>NASA's policies for lighting of facilities at WFF are based on Federal Aviation Administration, Occupational Safety and Health Administration, and NASA health and safety requirements. To the extent possible, NASA strives to reduce light pollution while still meeting the necessary laws and safety regulations regarding lighting. A discussion of light pollution has been added to Sections 3.3.4 and 4.4.4 of the Final EA. NASA appreciates the commenter's suggestions for a comprehensive light pollution survey, however as no substantial light-emitting sources would be installed under either Alternative, further detailed assessment within the scope of this EA is not warranted.</p>

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			<p>program needs to also be augmented and expanded on to include monitoring the “viewshed” outside NASA-WFF but possibly impacted by its external/outside lighting – and the public involved – (at almost no additional cost to taxpayers, and with very positive public relations potential) through use of volunteers in citizen-science programs, such as – but not limited to – the Citizen Sky program of the American Association of Variable Star Observers (AAVSO), the Globe at Night Program, and the Dark Skies Rangers Program. Again, expertise is available from Stars Unlimited to help NASA to create such a program involving the public. The light pollution assessment viewshed outside of NASA-WFF to be monitored for light pollution needs to extend out from the center of NASA-WFF out to a radius of at least 110 kilometers (68 miles), which is the approximate distance from the center of NASA-WFF to Fishermans Island National Wildlife Refuge in Virginia, which is just off the Delmarva Peninsula’s southern tip. Thus, this NASA-WFF DEA needs to include as an additional metric of the “physical environment” to measure of the success of both NASA-WFF, and all other NASA facilities’, renewable energy power generation efforts by measuring how much their use of energy efficiency reduces the level of light pollution that their facilities generate as measured by SQM readings of visual magnitudes per square arc-second. NASA’s light pollution avoidance and abatement effort also must include NASA’s officially acknowledging in any and all reports that it prepares on analyzing and addressing reducing this NASA-WFF’s light pollution, its working with IDA and any of the other organizations mentioned in these comments that it eventually works with. This light pollution avoidance and abatement effort also must include NASA annually publishing for both NASA-WFF, and all NASA facilities, the amount of energy saved through maximizing external/outdoor lighting efficiency by minimizing light pollution (in “negawatt”-hours), coal-fired power plant Global Warming carbon dioxide (and other air pollutants, like mercury and sulfur dioxide) not spewed into the atmosphere, nuclear power plant nuclear waste not generated, and taxpayer money saved by following these policies and practices.</p>		
10	Daniel J. Costanzo	Stars Unlimited	<p>The above mentioned light pollution avoidance and abatement effort that NASA needs to conduct as part of this NASA-WFF DEA must include in its study/analysis of “aesthetics” not only images and analysis of the “aesthetics” of the “viewshed” in and around NASA-WFF in daytime (as the DEA currently does), but also images and analysis of the “aesthetics” of the “viewshed” in and around NASA-WFF at nighttime as well, particularly in terms of any and all light pollution generated by NASA-WFF. That has to be part of NASA coming up with a plan for minimizing NASA-WFF’s light pollution as part of its maximizing NASA-WFF’s energy efficiency for this alternative energy project.</p>	Aesthetics	Please see response to Comment #9.
11	Daniel J. Costanzo	Stars Unlimited	<p>NASA’s light pollution avoidance and abatement effort must officially include NASA’s serving as a good environmental trendsetter by encouraging surrounding facilities and communities outside and around NASA-WFF to control their light pollution trespassing into the above mentioned light pollution assessment</p>	Aesthetics	Please see response to Comment #9.

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			viewshed extending out a radius of 110 kilometers (68 miles) out from the center of NASA-WFF, particularly through shielding all fixed outdoor lights otherwise directly visible from within that viewshed that are not operating lighthouses or other operational facilities for navigation/hazard avoidance. And NASA needs to follow this kind of trend setting practice around all its facilities.		
12	Daniel J. Costanzo	Stars Unlimited	Since the International System of Units (SI Units) is an integral part of NASA's work with space technology, astronomy, and related sciences, it needs to express all quantitative measures in this NASA-WFF DEA, and in all of its DEAs, always in SI Unit-dominant form, like they are in these comments here in terms of how the light pollution assessment viewshed's radius is expressed, with the dimension expressed in kilometers followed by it being expressed in miles in parentheses.	Editorial	All units presented in this EA are first shown in SI followed by the English equivalent. The editing and format style of NASA NEPA documents is specified in the NASA Style Guide Web site (http://history.nasa.gov/styleguide.html). This DEA follows the guidelines specified by the NASA guidance.
13	Daniel J. Costanzo	Stars Unlimited	Summary: Under today's circumstances, it is clearly not possible to achieve a truly light pollution-free dark sky above NASA-WFF, and other NASA facilities. However, much can be done by NASA to minimize light pollution using quality lighting technology and engineering. In fact, NASA has an opportunity here to once again serve in its traditional role from the Project Apollo Era as a trend setting federal agency by making its DEA for NASA-WFF into a model for incorporating dark sky protection through light pollution avoidance and abatement practices as an integral component of a systematic approach to energy efficiency planning and environmental impact assessment that can serve as an example for similar public facilities throughout the Nation, and around the World, while at the same time saving taxpayers money. NASA must take advantage of this opportunity and make it so.	Aesthetics	Please see response to Comment #9.
14	Mary A. Elfner	National Audubon Society	Audubon supports NASA's intention of generating energy from renewable sources at the WFF pursuant to requirements in the Federal Energy Policy Act (EPA) of 2005. However, due to impacts on high priority bird species, we are not in agreement with the construction of two utility-scale (2.0 MW) wind turbines on Wallops Island.	Alternatives	Comment noted. NASA also is concerned about potential adverse effects on bird species from the utility scale turbines and as such is no longer proposing their installation. In the Final EA, NASA has identified the large scale solar option with two residential-scale turbines as its Proposed Action/Preferred Alternative.
15	Mary A. Elfner	National Audubon Society	This project goes against several United States Fish and Wildlife Service (USFWS) recommendations of the proper siting of wind turbines, including the avoidance of placing wind turbines in documented locations of any species of wildlife, fish, or plant protected under the Federal Endangered Species Act, and the avoidance of locating turbines in known local bird migration pathways or in areas where birds are highly concentrated.	USFWS recommendations	Please see response to Comment #14.
16	Mary A. Elfner	National Audubon Society	Also, there are several species of concern that the EA does not address, namely the Piping Plover, Red Knot and Whimbrel.	T&E	Effects on the Whimbrel, although not specifically addressed in the EA would be similar to those of other shorebirds that are addressed, including the Red Knot and Piping Plover, in Sections 3.2.4.1 and 4.3.3 of the Final EA.
17	Mary A. Elfner	National Audubon Society	With these issues in mind, National Audubon supports Alternative 2: the construction of solar panels with up to five 2.4 kW turbines at the Main Base and mainland.	Alternatives	Please see response to Comment #14.
18	Kathy Phillips	Assateague Coastal Trust	We applaud the intent of NASA-WFF to generate clean renewable energy and to set an example of leadership in environmental stewardship and accountability. However, we are concerned that the Proposed Action, while well-intentioned, will have significant	Birds & Bats	Please see response to Comment #14.

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			adverse impacts on the wide range of bird species that depend on the area.		
19	Kathy Phillips	Assateague Coastal Trust	Land-based wind turbines can have potentially significant impacts on birds. This is one reason that the USFWS' guidance on minimizing wildlife impacts from wind turbines directs development away from local bird migration pathways and area of high bird concentrations. We recommend that NASA follow this guidance, focus on other options for clean energy generation, and not build land-based wind turbines on Wallops Island. If that is not possible, we recommend that NASA expand its avifauna impact studies to evaluate multiple years of data, and that the final EA or Environmental Impact Statement (EIS) include specific plans to identify and avoid unnecessary bird impacts.	USFWS recommendations	Please see response to Comment #14.
20	Jeffery D. Lapp	United States Environmental Protection Agency (EPA), Region 3	The need for the action should identify and describe the underlying problem or deficiency; and facts and analyses should support and describe the problem. The analysis should explain why the need for action for this particular location at this particular time. The purpose should be defined in relationship to addressing the need for action. The project need should support the desired 10 GWh/yr generation capacity for this project and explain how this capacity was reached. What is the future projected annual electricity and cost? And how much results from expanding operations at WFF? Provide information on the potential consequences, if any, of not increasing renewable energy at WFF, with respect to NASA as a whole and in terms of site regulations and Executive Orders (Eos).	Purpose and Need	The need for the project (identified in Section 1.5.2 of the Final EA) is NASA's current lack of renewable electricity sources in its energy portfolio as well as its rising utility costs. Regarding a quantification of NASA's renewable electricity needs, the need for renewable energy is limited only by the amount of electricity that WFF consumes, which in the previous 5 years has been between 25 and 30 GWh/year; however implementing a project to match annual usage would not be practicable due to siting constraints. WFF could not implement more than 2 utility-scale wind turbines which would generate approximately 10 GWh/year of electricity. The 10 GWh/year was then identified as a reasonable "baseline" for developing alternatives and comparing their respective effects. Compliance with the Federal EPC Act is measured at the agency level. Therefore, this project would contribute approximately 1 percent to an overall agency need of approximately 5 percent for Fiscal Year 2010. Section 1.5.2 of the Final EA further describes this rationale. Section 1.4.2 of the Final EA has been updated to include existing and planned energy efficiency and conservation measures. Regarding the consequences, NASA, as do all federal agencies, reports each fiscal year's renewable energy usage to the Office of Management and Budget (OMB) as part of its "scorecard." Not implementing this project would result in NASA reporting a lower "score" to Office of Management and Budget (OMB) which in turn reports this value to the U.S. Congress.
21	Jeffery D. Lapp	EPA, Region 3	Multiple times throughout the document 'residential scale' turbines are stated to be placed on the Mainland and Main Base, showing possible locations on Figure 4. Yet, Section Three for the Affected Environment states that "the Proposed Action activities that could affect the environment would take place on Wallops Island and the Main Base, and not on Wallops Mainland, this section does not provide a comprehensive description of conditions... for turbines is in fact on the Mainland, and the Mainland should be evaluated and described in detail in Section Three Affected Environment.	Miscellaneous	The EA has been updated to include the affected environment characterization of the WFF Mainland.
22		EPA, Region 3	The rationale for the inclusion of the five 2.4 kW turbines in the alternatives should be explained since they do not contribute a significant amount of power, and power generation goals are met without their inclusion in any of the alternatives.	Residential Scale Turbines	As described in the Section 2.1.2.1 of the EA, "their primary purpose would be to provide outreach and education to WFF employees and the public about wind energy." Currently, four residential and no commercial wind turbines exist in Accomack County; "one is in Quinby, one is in Nelsonia, one in Schooner Bay near Onancock, and one on the bayside behind Parksley." (Pers. comm. D. Fluhart to S. Silbert). Additionally, the intent of the residential-scale turbines would be to promote use of renewable energy by the public and to demonstrate NASA's commitment to utilize renewable energy sources. This information has been added to the Purpose section of the EA (Section 1.5.1). At the time of preparation of the DEA, exact locations of the remaining 3 residential-scale wind turbines were not known. However, NASA has removed the proposal to install the remaining 3 residential-scale turbines

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					from the Proposed Action and Alternatives in the Final EA; all alternatives in the Final EA include only 2 residential-scale wind turbines. The locations of the two residential-scale turbines were chosen for siting within areas with the highest visibility and traffic for WFF employees, visitors and the public. The Final EA has been updated accordingly.
23	Jeffery D. Lapp	EPA, Region 3	As the EA states that small turbines are to be used for educational purposes, please describe the intended outreach, educational programs and viewing area. It would be helpful if an accurate map showing the potential locations of all five proposed residential scale turbines was included in the DEA.	Residential Scale Turbines	Two of the 5 locations proposed for the residential-scale turbines were identified in the EA; the WFF Visitors Center and the Entrance Gate at WFF Mainland. The locations for the residential-scale turbines were chosen for siting within areas with the highest visibility and traffic for WFF employees, visitors and the public. Additionally, NASA's running public outreach series called "Science on the Shore" that is held at the WFF Visitors Center would include education about the use of wind energy. NASA has modified its proposal to only install the two identified residential-scale turbines as their locations would be the minimum needed to be visible to all persons visiting the WFF Main Base, Mainland, and Wallops Island facilities.
24	Jeffery D. Lapp	EPA, Region 3	Initial considerations for the proposed project involved the construction of 1.5 MW wind turbines, which met the goals of the project. Although it was eliminated from a detailed analysis, the 1.5 MW turbines were similar in design, configuration and cost to the 2.0 MW turbines. However, no discussions on potential environmental impacts from these smaller turbines were included. We recommend that the 1.5 MW wind turbine be carried forward for the detailed environmental analysis and evaluation, since it is a viable alternative that meets the needs of the project. Without undergoing this analysis, it cannot be assumed that the 1.5 MW and 2.0 MW turbines are interchangeable.	Alternatives	The rotor swept area and height of the 1.5 MW wind turbines (4,657 square meters swept area and 388 feet in height) is similar to the specifications of the 2.0 MW wind turbines (5,945 square meters swept area and 395 feet in height); the 1.5 MW turbines are not much smaller than the 2.0 MW turbines. Therefore, the environmental impacts between the 1.5 MW turbines and the 2.0 MW turbines are comparable.
25	Jeffery D. Lapp	EPA, Region 3	It is also unclear why alternative renewable energy, such as turbines, could not be developed elsewhere, but contributes to the power grid effectively, to avoid or minimize environmental impacts.	Alternatives	Locations outside of the WFF property were considered. As the wind turbines are moved further inland, the wind resource diminishes significantly (JMU, 2005; Iberdrola Engineering, 2009); therefore, to provide the same amount of energy, either larger capacity or more wind turbines would be required. Additionally, there would be environmental impacts from installing infrastructure to deliver the energy from the turbines to WFF (i.e., buried cables or power lines). NASA consulted with Dr. Jonathan Miles of James Madison University regarding this issue. On May 5, 2010, Dr. Miles provided the following response: "The proper siting of turbines must consider a micro-siting exercise that estimates the wind speed/direction profile at the precise location(s) where turbines are to be considered for installation. The total energy produced by a wind turbine during a season is very closely correlated with the wind speeds that prevail. Therefore, as the return on the investment for wind power is generally very modest, even slight variations between actual and predicted wind speeds can make or break the economics of a project. Thus, wind turbines should be sited within a tract or parcel of land in the locations that bear the known highest wind speeds. The AWS Truewind map for Virginia depicts a coastal wind resource, along both east and west sides of the peninsula, that diminishes rather quickly as one tracks from just off the coast, across the waterfront, and onto the mainland. Nominally, there is a rather abrupt reduction in average wind speed by as much as 1 m/s or greater as one tracks from the barrier islands to just barely onto the mainland. For a 1.5-MW wind turbine, a reduction of 1 m/s could reduce the amount of energy produced in a year by 40% or more. This would result in a substantial loss of potential of the wind turbines to produce energy and would significantly impact the economic as well as environmental benefits that wind can provide at the Wallops Flight Facility. It is my strong recommendation, based upon a comprehensive study that my group performed at Wallops in 2005-07 and my review of the draft environmental assessment, that the sites being considered for wind power deployment on the barrier

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26	Jeffery D. Lapp	EPA, Region 3	Please explain why the same wetlands criterion was not used for siting both utility and residential scale turbines.	Wetlands	Because the potential locations to install the residential-scale turbines are not nearly as restricted as the utility-scale turbines (due to height and FAA requirements, avoiding interference with radar, launch tracking azimuths, set back from existing buildings, and etc.), they can be placed in areas outside of wetlands. However, due to the restrictions for siting the utility-scale turbines, the only suitable area fell within wetlands and therefore impacts on wetlands could not be avoided for installation of the larger turbines.
27	Jeffery D. Lapp	EPA, Region 3	For mitigation, it would be appropriate to describe the location, current community composition, current ecosystem type, and connection to hydrology for proposed mitigation. It would also be appropriate to look at mitigation of the multiple projects being proposed by NASA and prepare comprehensive mitigation.	Wetlands	Please note that the Proposed Action in the Final EA (solar panels and 2 residential-scale wind turbines), which has changed from the DEA, would not result in any impacts on wetlands. For Alternatives One and Two in the Final EA, which would result in impacts on wetlands from construction of utility-scale wind turbines, the location and wetland ecosystem types for the compensation areas were identified on Figure 19; the Final EA has been updated to include the wetland types for the compensation areas. Further detailed evaluation of compensation (typical of what would be provided in a permit application) is not warranted given that NASA is no longer proposing a project that would have wetland impacts.
28	Jeffery D. Lapp	EPA, Region 3	Clarify whether the proposed mitigation involved the creation of wetlands on uplands, or is a modification/enhancement of existing wetlands on WFF property. Please discuss the timing of compensatory mitigation with respect to the timing of impacts. The inclusion of the referenced NASA, 2009a Wetland Delineation would be helpful as an appendix to the DEA. Official correspondence with the Army Corps of Engineers confirming the delineation should also be included.	Wetlands	Wetland compensation for impacts under Alternatives One and Two of the Final EA (note change in alternatives from DEA to Final EA) would occur at Wallops Mainland on existing WFF property and would involve modification/enhancement and creation of new wetlands on uplands. NASA strives to maintain brevity in its NEPA documents, particularly EAs. Accordingly, and in consideration of the fact that the Proposed Action no longer would result in wetland impacts, the wetland delineation report is not provided as an Appendix to the EA. NASA would gladly provide a copy of the delineation report and U.S. Army Corps of Engineers (USACE) jurisdictional determination directly to the commenter upon request.
29	Jeffery D. Lapp	EPA, Region 3	The EA mentions that "NASA is currently preparing a wetlands inventory and assessment for WFF. The goal of this effort is to provide strategic regulatory, environmental, and land use analysis of all wetlands on the Main Base, Wallops Mainland, and Wallops Island in order to develop a comprehensive long-term wetland management plan for the facility." This investigation should be part of the NEPA documentation being prepared for the WFF. This should be reviewed and coordinated with agencies responsible for providing expertise and support to NASA on issues of wetlands and Waters of the US.	Wetlands	The subject text has been removed from the Final EA for two primary reasons. First, the Proposed Action would not result in impacts to wetlands. Second, NASA's "inventory and assessment," was in reality a series of wetland delineations supporting the early planning for a single-user compensation bank. All supporting documentation was provided to agencies on Virginia's Interagency Review Team (IRT), of which EPA is a member. Following review and discussion with the IRT, a bank is no longer being pursued at this time. However, if in the future, NASA pursues any long term wetland management strategies, it would coordinate with appropriate agencies at that time.
30	Jeffery D. Lapp	EPA, Region 3	EPA recommends a thorough evaluation of the resources, particularly aquatic, bird and bat population, their historic baseline and cumulative impacts. A historic baseline is often set at a major event changing the local environment. In the case of WFF, this could be the start of the facility in the 1940's. Analysis of the trend of the value and quantity of the resources of interest should be developed and considered as part of cumulative impacts.	Birds & Bats	The cumulative effects section has been revised from the DEA to reflect the change in the Proposed Action from utility-scale wind turbines as the primary project component to solar panels as primary component.
31	Jeffery D. Lapp	EPA, Region 3	The EA does provide a summary of information on foreseeable projects and four historical projects, from the past 13 years, mostly attempting to quantify affected resources. CEQ and EPA guidance on preparation and review of Cumulative Effects Analysis (CEQ, January 1997, Considering Cumulative Effects and EPA, May 1999, Consideration of Cumulative Impacts in EPA Review of	Cumulative	The cumulative section has been revised from the DEA to reflect the change in the Proposed Action from utility-scale wind turbines as primary component to solar panels as primary component. The discussion of impacts includes the loss of resources such as changes in land use from installation of solar panels and potential impacts on (loss of) birds & bats from installation of residential-scale wind turbines.

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			NEPA Documents) states that the document should present analysis of lost value from the loss of resources, over time and projected into the future.		
32	Jeffery D. Lapp	EPA, Region 3	How would major storms, nor'easters and floods affect the proposed action? How will potential impacts from sea level rise impact the proposed action? Please discuss the facility adaptation, such as is directed by CEQ draft NEPA guidance (2010) on Considerations of the Effects of Climate Change and Greenhouse Gas Emissions.	Climate Change	Section 4.5.3.3 of the EA discusses the Proposed Action's impacts on greenhouse gases. The residential-scale turbines and solar panels would be constructed outside of the floodplain and would be built to withstand weather conditions including storms. The utility-scale wind turbines would be able to withstand major storms such as hurricanes and nor'easters and inundation from flooding. The electrical components of the utility-scale wind turbines are housed within the nacelle and tower, and the switchgear and any other electrical equipment outside of the turbine itself would be constructed above the mean flood elevation of 11 feet amsl at Wallops Island.
33	Jeffery D. Lapp	EPA, Region 3	Please discuss potential impacts from staging areas. Describe the vegetation/habitat that is currently found in the staging areas.	Staging Areas	The staging areas for the utility-scale wind turbines and solar panels are either dirt or paved areas or located on grassy areas that are maintained by mowing. No unmaintained vegetated areas would be used; therefore no trees would be removed, vegetation denuded, or wetlands affected during staging. Potential impacts would be short-term and minimal.
34	Jeffery D. Lapp	EPA, Region 3	Clarify how the installation solar panels adversely affect land use characteristics. How were impacts associated with panels determined to be long term and adverse? Describe the shallow excavation activities required for the construction of solar panels. Will panels be accessed by using existing infrastructure or will new access roads be constructed?	Solar Panels	The impacts from solar panels on land use would be long term and adverse because they would be removing a usable portion of land at the Main Base from potential uses by other projects/needs. The long-term designation comes from the useful life of the solar panels (25 years). However, impacts on land use would not be permanent because if needed, the panels could be removed, therefore returning the land use to open space. Shallow (less than 10 feet deep) holes for setting the posts of the support structures for the solar panels and any buried connection lines would be the only ground disturbance for installation of the panels; Section 2.3.2.1 of the EA has been updated with this information. No new access roads would be constructed to access the solar panels.
35	Jeffery D. Lapp	EPA, Region 3	More clearly describe the above ground non-turbine components of the proposed projects, including switch gears, lines, etc. Discuss the impacts from these components.	Miscellaneous	The components of the wind turbines are mentioned in Section 2.1.2 of the EA to the level of detail NASA feels is appropriate for evaluation of potential impacts. Section 4.2.6 of the EA (Hazardous Materials and Hazardous Wastes) describes the impacts from materials such as gear oil used in conjunction with each of the wind turbine and appurtenant infrastructure components. Ground disturbance from lines and construction of other components is addressed in Section 4.2.1.2 Geology and Soils.
36	Jeffery D. Lapp	EPA, Region 3	The DEA states that local construction crews would be used during the construction process. Have any local contractors who have the specialized expertise in installing wind turbines been identified?	Socioeconomics	WFF is unaware of local contractors with expertise in installing wind turbines; however, during the procurement process qualified contractors would be evaluated. Because no measurable impacts would occur on population, employment or income under any of the Proposed Action Alternatives and No Action Alternative, these sections were removed from the Final EA.
37	Jeffery D. Lapp	EPA, Region 3	A discussion of the timing and schedule for construction would be helpful to include in the DEA. Will any time of year/seasonal restrictions be placed to reduce impact to area wildlife?	Construction Schedule/Timing	No protected wildlife species are anticipated to be affected from the installation of solar panels or residential scale wind turbines therefore time of year restrictions would not apply.
38	Jeffery D. Lapp	EPA, Region 3	Discuss road closures expected to result from the project, how these closures will affect local population, and how these closures could potentially impact hurricane evacuation routes? Has any coordination occurred with Accomack County, local police, or VDTARO? Please include these letters in appendix G.	Transportation	No impacts on transportation systems would be expected as all solar panels and equipment would be carried via typical tractor-trailer vehicles. The Virginia Department of Transportation was provided the opportunity to review the DEA; the agency's comments support this conclusion and are provided in Appendix G and in this Table as Comment #137.
39	Jeffery D. Lapp	EPA, Region 3	Explain how viewshed vantage points were selected and how the use of five different points to characterize the aesthetics is supported. Explain how this analysis was conducted. Visible wind turbines should be analyzed to determine if the viewshed would be affected, without the proper analysis effects on the viewshed	Aesthetics	The 5 viewshed vantage points were chosen to represent the closest locations to residential developments or high traffic areas with unobstructed views of Wallops Island where the utility-scale wind turbines could be seen. Section 4.4.4 of the EA explains that digital photographs were taken from each key vantage point then simulations of the 2 proposed utility-scale wind turbines were added to the digital

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			should not be assumed. Potential impacts resulting from the installation of residential scale turbines should also be examined. It was assumed in the DEA that these turbines would not have an effect on aesthetics, although no supporting analysis was given, nor was an exact location of the turbines given. Potential impacts to aesthetic viewsheds to users of local fisheries and recreational boaters should be included.		photographs to determine the impacts on the viewshed from each vantage point. Regarding impacts on boaters (both commercial and recreational), the EA states that the landscape surrounding the turbines already contains infrastructure of height such as radio towers and buildings; therefore the character of the viewshed would not be substantially altered from any angle. The EA has been revised to include impacts on the viewshed from the water and has been updated to include viewshed impacts from installation of residential-scale wind turbines.
40	Jeffery D. Lapp	EPA, Region 3	What is the impact of shadow flickering on wildlife? The document discusses potential impacts of the effect on WFF employees, but does not discuss how wildlife will be affected.	Birds & Bats	NASA acknowledges that there is a limited amount of knowledge relating potential wildlife impacts to shadow flicker caused by wind turbines. The following text has been added to Section 4.3.2 "Flicker is one factor that may affect wildlife and its use of available habitat. The few studies that have been conducted generally observe changes in wildlife behavior in response to wind turbines without attempting to distinguish the effects of verticality, noise, motion, or flicker. Species of birds and small mammals that require open grasslands and are often preyed upon by raptors may be most affected by flicker. In such an environment, a rapidly moving shadow can indicate the presence of a bird of prey. Whether a constantly repeated shadow is tolerated, or elevates levels of stress in prey species, or even potentially results in habitat exclusion, is unknown." Additionally, to ground truth the analysis, NASA is proposing to conduct post construction biological monitoring at the residential scale turbine sites as outlined in Section 5.2.
41	Jeffery D. Lapp	EPA, Region 3	Groundwater, munitions and explosives of concern (MECs), and health and safety were determined by NASA to have no impacts and analysis of these resources was not included in the DEA. Without the proper analysis being included in the document, it should not be assumed no impact will occur. A discussion of groundwater resources and known contaminants, and known locations of MECs should be included in the DEA. This should also include any history of known Superfund sites and activities at WFF.	NEPA Process	As stated in the NASA Procedural Requirements for Implementing NEPA (NPR 8580.1 - Chapter 5) Section 5.3.2.4 Affected Environment, "The description of the affected environment should be brief, focusing on those elements of the environment likely to be affected by the proposed action and alternatives, including No-Action. The level of detail should be sufficient to provide the base against which environmental impacts can be addressed. For example, if the proposed action and alternatives would not impact groundwater resources, do not put time and detail into describing that aspect of the environment." Upon initial evaluation of potential environmental impacts, NASA determined that some resources (i.e., groundwater) would not be affected by the No Action or Proposed Action; therefore it is not necessary to include them in the EA analysis.
42	Jeffery D. Lapp	EPA, Region 3	The Environmental Justice (EJ) assessment should assure the protection and appropriate level of consideration for the potential adverse impacts that may have an effect on minority and low income populations living in the area near the site. The document should identify where such populations are located, and what potential impacts may occur.	Socioeconomics	Section 3.3.1 of the EA includes identification of income and poverty statistics as they relate to EJ for the populations relevant to the area surrounding WFF. Tables 16 and 17 were added to this section; they compare the 2000 Census Tract minority and poverty data, respectively, to Accomack County and Commonwealth of Virginia Census data to determine how the areas adjacent to WFF measure up to these larger-scale benchmarks. Section 4.4.1 of the EA has been updated to state that the type and intensity of effects on minority or low-income persons from either action alternative would be the same as those affecting persons of all other ethnicities or income - these effects are discussed in detail in each resource areas section in the EA. Section 4.4.1 also discusses NASA's public outreach efforts for all persons.
43	Jeffery D. Lapp	EPA, Region 3	A definition of a minority community can be found on page 78 of the DEA. An exact definition of what constitutes a minority has not been released by EPA or the EJ Coordinators, this definition is inaccurate. We recommend, along with the removal of this statement, that minority and low income populations be compared to the state and local demographics, defining minority and low income populations in relation to the state, county or local averages. More comprehensive demographic information regarding the minority and low-income populations of each community should be supplied along with maps highlighting the localization of those communities in relation to the site and any	Socioeconomics	The reference statement on page 78 of the DEA that the minority definition came from EPA has been removed. More information on EJ statistics within Accomack County census tracts has been added to the EJ Section 3.3.1; Tables 16 and 17 of the Final EA show the census tract information for communities surrounding WFF compared with Accomack County and the state. A new figure showing census tracts in Accomack County has been added.

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			and all work that will be conducted.		
44	Jeffery D. Lapp	EPA, Region 3	Please describe the effects to ensure the protection of minority and low-income populations. Describe which communities were identified as potential EJ concern and how these populations are being involved through outreach in the decision making process.	Socioeconomics	WFF strives to notify and involve the entire community regardless of income or ethnicity by publishing notices in the free local newspapers, on the internet, on public electronic marquees and by providing copies of documents at local public libraries. For this project, NASA held a public meeting which was announced in two local newspapers, one of which is a free weekly publication. NASA also published Notices of Availability of the Draft and Final EA in the same newspapers. Additionally, NASA has posted copies of the Draft and Final EA on the internet. Additional text regarding this outreach has been added to Section 4.4.1 of the Final EA.
45	Jeffery D. Lapp	EPA, Region 3	Residential displacements are not the only concern that should have been taken into consideration for potential EJ issues. Describe what other types of impacts were considered and include them in the DEA. Potential concerns that were not included may be noise, air and water quality issues, changes in employment opportunities, and subsistence fishing impacts.	Socioeconomics	Although there are low income and minority populations within Accomack County, the Proposed Action would involve activities similar to those currently conducted at WFF, and the current WFF Environmental Justice Implementation Plan (EJIP) found that WFF activities do not disproportionately affect low-income or minority populations (NASA, 1996). Because no disproportionately high or adverse impacts on low-income or minority populations would occur, and any impacts from the Proposed Action would be shared equally among local populations, it is not necessary to repeat the impacts that are described under the various resource sections of the Environmental Consequences chapter. The statement about displacement of residences (EA stated that displacements would not occur) was removed from this section.
46	Jeffery D. Lapp	EPA, Region 3	Page 80 of the DEA, states that in 2003 a <i>Cultural Resources Assessment of Wallops Flight Facility, Accomack County, Virginia (CRA)</i> was conducted. The study focused on aboveground resources at WFF and "...the CRA established a predictive model for understanding the archaeological potential over the entire WFF property. "...Virginia Department of Historic Resources (VDHR) accepted the predictive model for archaeology at WFF, noting that many of the areas with moderate to high archaeological potential are unlikely to be disturbed by future construction or site use (NASA, 2003b)." The Final EA should provide information supporting the VDHR conclusion that potential archaeological areas would unlikely be disturbed by future construction or site use. This is a definitive statement that most likely describes the potential archaeological areas that would not likely be affected by construction or use even without knowing future actions. Detailed information would be helpful in understanding the area and the derivative of this conclusion of VDHR.	Cultural	With concurrence from VDHR, NASA WFF uses the predictive model for archaeology presented in the 2003 study as a management tool but continues to consult with the VDHR and other consulting parties in compliance with Section 106 on a case-by-case basis. NASA consulted with VDHR regarding the installation of the proposed project components; consultation documents are located in Appendix D.
47	Jeffery D. Lapp	EPA, Region 3	In addition, a letter from VDHR dated December 4, 2003 is referenced stating their concurrence with the findings of the CRA. A copy of the letter from VDHR should be provided in the Appendix. It would also be helpful to include the <i>Cultural Resources Assessment of Wallops Flight Facility</i> in the Appendix of the Final EA or EIS since this document serves as the baseline for identifying potential archaeological resources.	Cultural	The 2003 report is available at http://sites.wff.nasa.gov/code250/cultural_resources_assessment.html . Other documents referenced in the EA are available from NASA WFF upon request. Please contact Randall Stanley, WFF Historic Preservation Officer, at 757-824-1309, for further information.
48	Jeffery D. Lapp	EPA, Region 3	Page 80 states that an <i>Historic Resources Survey and Eligibility Report for Wallops Flight Facility (NASA, 2004)</i> was prepared in which two resources, the Wallops Coast Guard Lifesaving Station and the Coast Guard Observation Tower were determined to be eligible for listing in the National Register of Historic Places (NRHP) and Virginia Landmarks Register. In a letter dated November 4, 2004, VDHR concurred with the findings and determinations in the report. The November 4, 2004 letter from	Cultural	The 2004 VDHR letter is available at http://sites.wff.nasa.gov/code250/docs/Appendix%20B%20-%20Agency%20Coordination.pdf . Other documents referenced in the EA are available from NASA WFF upon request. Please contact Randall Stanley, WFF Historic Preservation Officer, at 757-824-1309, to obtain these documents.

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			VDHR should be provided in the Appendix of the Final EA and the report as well since it serves as the baseline for the identification of the aboveground historic properties at WFF.		
49	Jeffery D. Lapp	EPA, Region 3	In addition, the two resources eligible for listing on the NRHP should be identified on a map as well as the two historic archaeological sites referenced on page 80 and their association and proximity to the two utility scale turbines located on Wallops Island.	Cultural	A map that identifies the location of the two NRHP-eligible above-ground resources has been added to the Chapter 4 Cultural Resources discussion in the EA. Pursuant to ARPA and in accordance with VDHR practice, the locations of the two archaeology sites within the study area for the utility-scale wind turbines have not been specified in the EA. It should be noted, however, that both archaeological sites are located a significant distance from any ground-disturbing activity associated with the utility-scale wind turbines.
50	Jeffery D. Lapp	EPA, Region 3	As stated on page 80, "Since the 2004 report, no additional large-scale identification and evaluation of historic properties have been conducted at WFF. Survey updates at WFF may reveal aboveground historic properties not identified in the 2004 report, including properties that have achieved 50 years of age since 2006 and properties that are less than 50 years of age that meet NRHP Criteria Consideration G, which states that properties may be eligible for listing in the NRHP if they possess exceptional importance." Considering the magnitude of the proposed project and other projects planned for WFF, it would be prudent to update the survey during the planning and environmental analysis phase of the proposed action to consider and evaluate all resources that may have the potential to be impacted.	Cultural	NASA recognizes the need to maintain a current inventory of potentially eligible historic structures. Since publishing the Draft EA, NASA has undertaken an effort to survey more than ninety (90) additional aboveground resources for potential National Register eligibility. Once complete, the resulting reports will be made available to the public. It should be emphasized, however, that NASA has consulted with VDHR regarding the Alternative Energy Project, and VDHR concurred with NASA's "no adverse effect" determination.
51	Jeffery D. Lapp	EPA, Region 3	Page 130 states, "In December 2009, NASA WFF initiated Section 106 consultation with VDHR for the Alternative Energy Project." It also states, "Since initiation of the Section 106 process, NASA has revised its alternatives to include a residential-scale wind turbine component. The Section 106 process remains ongoing pending further development of the solar panel and residential-scale wind turbine components." Adding the solar panels and residential-scale wind turbine components and not knowing the locations of them, makes it difficult to properly assess the impacts of the proposed action on cultural resources. This information is necessary in providing a thorough analysis of the impacts from the proposed actions.	Cultural	Since the release of the DEA, NASA has revised the proposal of constructing 5 residential-scale turbines under all alternatives to 2 residential-scale wind turbines under all alternatives (they are the two that were identified specifically in the DEA - the WFF Visitor Center and the entrance gate to the Mainland). WFF also modified its proposed action to include better-defined solar panel locations. Accordingly, NASA presented the additional information to VDHR in support of its ongoing consultation. VDHR concurred with NASA's "no adverse effect" determination, supporting NASA's conclusion in the EA that the Proposed Action would not have adverse effects on historic properties. Please see Appendix D for additional detail regarding the consultation.
52	Jeffery D. Lapp	EPA, Region 3	As stated on page 131, utility-scale turbines, uses cell tower guidance to assess visual impacts. Visual impacts is one aspect of impact, the DEA did not address whether the operation of the turbines would have an effect on the integrity of the cultural resources. Please discuss in the Final EA or EIS.	Cultural	NASA has determined that indirect effects to above-ground historic properties will be limited to visual effects, and that visual effects to those historic properties will not diminish the qualities of those properties that make them eligible for listing in the NRHP.
53	Jeffery D. Lapp	EPA, Region 3	Page 131 states, "Eighty unevaluated resources exist within the area of potential effect (APE), 13 of which are over 50 years of age." The eighty resources should be evaluated for NRHP eligibility and is subject to a Section 106 review.	Cultural	NASA identified these resources as being utilitarian in nature. The portions of the APE in which the built resources are located are currently characterized by numerous towers, test stands, and antennae from various periods of construction. Given this context, NASA has determined that construction of the utility-scale turbines is not likely to have an adverse effect on the setting or feeling of any yet-to-be identified NRHP-eligible resources, if present, in the APE. Since publishing the DEA, NASA changed its proposed action to include solar panels and residential-scale turbines instead of utility-scale turbines. Since this change was made, NASA consulted with VDHR; the agency concurred with NASA's "no adverse effect" determination.

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54	Jeffery D. Lapp	EPA, Region 3	As stated on page 132, "WFF is characterized by numerous towers, test stands, and antennae from various periods of construction." Given this context, the construction of the residential-scale turbines is not likely to have an adverse effect on the setting or feeling of any yet-to-be identified NRHP-eligible resources, if present, within the boundaries of the WFF." Again, impacts to cultural resources should be looked at beyond visual. EPA questions weather operation of the turbines could affect the integrity of the resources.	Cultural	NASA has determined that indirect effects to above-ground historic properties would be limited to visual effects, and that visual effects to those historic properties would not diminish the qualities of those properties that make them eligible for listing in the NRHP.
55	Jeffery D. Lapp	EPA, Region 3	Page 132, "Indirect visual effects on historic properties outside of the WFF property cannot be determined at this time. Once the locations of the residential-scale wind turbines are determined, NASA would consult with VDHR." It is important to note that the EA is the vehicle for evaluating the impacts of a proposed action on various resources. In essence, the EA is also the vehicle to evaluate siting locations and impacts from the proposed action. The possible and very probably locations for the residential-scale wind turbines should be addressed in the Final EA or EIS.	Cultural	At the time of preparation of the DEA, exact locations of the remaining 3 residential-scale wind turbines were not known; however, NASA has removed these 3 residential-scale wind turbines from the Proposed Action and Alternatives of the Final EA (the 2 residential-scale turbines specifically identified in the DEA are carried forward in the Final EA). The EA has been updated accordingly.
56	Jeffery D. Lapp	EPA, Region 3	In 1996, EO 13007 was issued to protect Native American religious practices. This EO directs Federal land-managing agencies to accommodate Native Americans use of sacred site for religious purposes and to avoid adversely affecting the physical integrity of sacred sites. Federal agencies are directed to consult with tribal governments prior to taking actions that affect federally recognized tribes and to ensure that Native American concerns receive consideration during the development of Federal projects and programs. It is not clear if WFF has had any past association with Native American, but the Final EA or EIS should state whether or not NASA considered this in their evaluation.	Cultural	No Tribal resources have been previously identified in the project area. In a letter to VDHR dated April 16, 2010, NASA stated that according to the Federal Bureau of Indian Affairs, there are no federally recognized tribes registered in the state of Virginia; and according to the Virginia Council on Indians (VCI), there are no state-recognized tribes registered in Accomack County, Virginia. VDHR responded in a letter dated May 12, 2010, requesting that NASA contact the VCI directly regarding Indian Tribes that may have an ancestral interest in the area. VCI responded stating that no concerns had been raised by Virginia tribes regarding wind turbines. NASA WFF will continue to consult with VDHR and Indian Tribes, as appropriate within the context of the Section 106 process, should any be identified with an interest in the project.
57	Michael Lipford	The Nature Conservancy	In May of 2003, the USFWS issued Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines. While the Guidance purports to advise USFWS personnel in providing technical assistance, we believe it is the best and most authoritative source for siting and designing onshore wind energy installations. With regard to siting, the Guidance includes the following recommendations that are directly relevant to the WFF proposal: 1. Avoid placing turbines in documented locations of any species of wildlife, fish, or plant protected under the Federal Endangered Species Act. 2. Avoid locating turbines in known local bird migration pathways or in areas where birds are highly concentrated, unless mortality risk is low (e.g., birds present rarely enter the rotor-swept area). Examples of high concentration areas for birds are wetlands, State or Federal refuges, private duck clubs, staging areas, rookeries, leks, roosts, riparian areas along streams, and landfills. Avoid known daily movement flyways (e.g., between roosting and feeding areas) and areas with a high incidence of fog, mist, low cloud ceilings, and low visibility. Wallops Island fully meets the criteria for avoidance areas described above as it is located in an important migration pathway, concentration and breeding area for many bird species which are listed as endangered, candidates for such listing, or otherwise identified as species of special concern. Therefore, the proposal to site utility-	USFWS recommendations	Please see response to Comment #14.

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			scale wind energy facilities on the island is in direct contradiction to the guidance provided by the USFWS.		
58		The Nature Conservancy	<p>Use of the recommendations of USFWS Voluntary Guidelines for Wind Siting and Operations in determining whether wind power is appropriate on Wallops Island. Further study and analysis to address the following study design and quality of data collection issues regarding bird and bat use of the project area, particularly given the known importance of the surrounding area to birds and suspected importance to bats. Recommended changes to the study design include:</p> <ul style="list-style-type: none"> • Since a one-year study does not capture the scope of bird use of the study area, particularly temporal variation in bird use, we fully agree with USFWS' recommendation to collect data for three years to determine times of peak bird use in areas with known high concentrations of birds. • Full evaluation of the risk of collision/ exposure with turbines for a given species based on its migration patterns (timing altitude, flight direction, etc.). • Develop common standards for observer training or experience with regards to point counts and carcass surveys. • Include nocturnal surveys. USFWS (2009) does not necessarily recommend pre-construction nocturnal studies, except in cases where the proposed project area falls within potentially high impact areas, like coastal migration corridors which characterize Wallops. • Improve carcass searches to collect carcasses at consistent frequency or adjust for different collection frequencies. • Evaluate impacts to state listed species. 	USFWS recommendations	Please see response to Comment #14.
59	Michael Lipford	The Nature Conservancy	Since a one-year study does not capture the scope of bird use of the study area, particularly temporal variation in bird use, we fully agree with USFWS' recommendation to collect data for three years to determine times of peak bird use in areas with known high concentrations of birds.	USFWS recommendations	Please see response to Comment #14.
60	Michael Lipford	The Nature Conservancy	Full evaluation of the risk of collision/ exposure with turbines for a given species based on its migration patterns (timing altitude, flight direction, etc.).	USFWS recommendations	Please see response to Comment #14.
61	Michael Lipford	The Nature Conservancy	Develop common standards for observer training or experience with regards to point counts and carcass surveys.	Birds & Bats	Please see response to Comment #14.
62	Michael Lipford	The Nature Conservancy	Include nocturnal surveys. USFWS (2009) does not necessarily recommend pre-construction nocturnal studies, except in cases where the proposed project area falls within potentially high impact areas, like coastal migration corridors which characterize Wallops.	Birds & Bats	Please see response to Comment #14.
63	Michael Lipford	The Nature Conservancy	Improve carcass searches to collect carcasses at consistent frequency or adjust for different collection frequencies.	Birds & Bats	Please refer to revised text in Chapter 5 that refers to the frequency of carcass searches.
64		The Nature Conservancy	Evaluate impacts to state listed species.	Birds & Bats	Please refer to Section 4.3 in the EA.
65	Michael Lipford	The Nature Conservancy	Selecting Alternative Two will reduce the potential impacts to birds and bats while still meeting WFF's renewable energy goals of the project. Selecting the No Action Alternative will avoid avian and bat	Alternatives	Comment noted. NASA has determined that the No Action Alternative does not meet the purpose and need of the Alternative Energy Project. Based on public comments on the DEA, NASA has revised the alternatives so that installation of 10 GWh/year of

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			impacts altogether. We recommend that these two alternatives be revisited in light of these considerations.		solar panels and 2 residential-scale wind turbines is now the Proposed Action. NASA's original preference for utility-scale wind turbines under the Proposed Action in the DEA was due to the overwhelming cost difference between utilization of equivalent amounts of wind energy versus solar energy.
66		The Nature Conservancy	Further, should WFF decide to move forward with Alternative Two, we urge that NASA consider installing solar panels only. The draft EA does not explain the need for 5 residential scale turbines, and this should be explored more fully in any final EA or EIS.	Residential Scale Turbines	See response to comments #22 and #23.
67		The Nature Conservancy	In addition, the potential wildlife impacts of any residential scale turbines should be further considered and documented, especially related the risk of bird and bats with the associated guy wires. As is pointed out in the December 2009 draft of the USFWS Wind Turbine Guidelines Advisory Committee "the risk of adverse impacts to wildlife and their habitats tends to be a function of site location, not necessarily the size of the project."	USFWS recommendations	NASA acknowledges that there is a limited amount of knowledge relating potential wildlife impacts to residential scale turbines. The best available existing data on was incorporated into the EA analysis in Section 4.3. The residential turbines would have a monopole design and not rely on guy wires, which should reduce the impacts to birds and bats. Additionally, to ground truth the analysis, NASA is proposing to conduct post construction biological monitoring at the turbine sites as outlined in Section 5.2.1.
68	Michael Lipford	The Nature Conservancy	If WFF chooses to pursue the installation of utility-scale turbines, then we believe a Finding of No Significant Impact cannot be made, and a full Environmental Impact Statement must be required due to potential adverse impacts to migrating bird and bat species. We recommend that the EIS should include: Further analysis regarding NASA's overall energy needs, the potential for meeting EPA targets through energy conservation and efficiency improvements, and an explanation of whether/why NASA has chosen WFF as the appropriate site for making renewable energy investments, in comparison to other NASA facilities.	EIS	Please see response to Comment #14. Additionally, the appropriate level of documentation regarding analysis of WFF's energy needs and benefits of this project is included in the EA. NASA does already implement energy conservation and efficiency improvements at WFF. Sections 1.4.2 and 1.5.2 of the EA has been updated to include NASA's current and planned energy conservation measures as well as how WFF's project fits into the Agency's approach to meeting renewable energy requirements. NASA requires that each of its facilities in various geographic locations strive to meet the EPA requirements - therefore, in response to the need to obtain energy from renewable sources at WFF, the Proposed Action alternatives were evaluated and impacts presented in the DEA. The EA has been developed to disclose the impacts from the project so that a decision can be made regarding whether or not these impacts are significant and a Finding of no Significant Impact (FONSI) would be signed or whether an EIS should be prepared.
69	Cindy Schulz	USFWS	<u>Section 1.4 Purpose and Need.</u> The EPA requires Federal agencies to reduce energy consumption and cost. The WFF plan to lower electricity consumption through improved energy efficiency programs should be included in the project need. WFF should outline their current and future efforts to reduce energy consumption at the facility, and if energy consumption is lowered at the WFF, renewable energy needs would also be reduced.	Purpose and Need	WFF's current energy efficiency improvements have been added to Section 1.4.2 of the Final EA.
70	Cindy Schulz	USFWS	<u>Section 1.4 Purpose and Need.</u> It is not clear where the goal to generate up to 10GWh per year from alternative energy sources at WFF is derived. The EPA requires that of the total amount of electric energy consumed by the Federal Government during any fiscal year, renewable energy shall not be less than 5 percent in fiscal year 2010 through 2010 and not less than 7.5 percent in fiscal year 2013 and each fiscal year thereafter. As provided in Table 2 in the DEA, NASA's annual electricity usage is approximately 30 GWh (Gigawatt hour) per year. Therefore, to meet the goals of the Act, NASA would need 2.25 GWh from renewable energy by fiscal year 2013. Since the Act allows the action production calculation to be doubled on federal facilities, the actual amount needed is 1.125 GWh. These calculations do not include further reductions that should occur by implementing an energy consumption reduction plan at WFF. The proposed 10GWh contributes 33 percent of renewable energy, which is actually a 66	Purpose and Need	Please see responses to Comments #14 and 20.

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			percent contribution according to the Act. This far exceeds the requirements of the Act. Because the preferred alternative will result in impacts to federally listed species, trust resources, and wetlands and WFF, the Service recommends that NASA provide additional information that demonstrates the need for 10GWh of renewable energy at this site. The draft EA does not currently provide adequate information to justify the need for 10GWh, particularly at the proposed location.		
71	Cindy Schulz	USFWS	<u>Section 1.4 Purpose and Need.</u> The need for five residential turbines is not clearly articulated in the DEA. WFF states that the residential turbines will be built for educational purposes. There is no rationale provided for five and NASA has only identified two locations where the residential turbines will be located. This suggests a lack of need for the remaining three.	Residential Scale Turbines	Please see response to Comment #22.
72	Cindy Schulz	USFWS	<u>Section 2.1 Range of Alternatives Considered for Renewable Energy.</u> No alternatives were considered at offsite locations. The Service recommends that NASA expand its alternatives analysis to include the installation of solar and/or wind at offsite locations in the vicinity of WFF. This alternative would appear to meet the project purpose, and represent improvements in environmental stewardship by adhering to siting guidelines and reducing environmental impacts. A location on the mainland farther from the water's edge within the vicinity of WFF could avoid wetland impacts and reduce likelihood of bird mortality by avoiding placement within high-quality bird habitat. Some impacts to birds and bats would still likely occur, but we would expect it to be reduced compared to the preferred alternative.	Alternatives	See response to Comment #25.
73	Cindy Schulz	USFWS	<u>Section 2.1.1.3 Solar Power.</u> Page 17 of the draft EA states that "There is an insufficient amount of buildings... to allow for a majority of the panels to be installed on rooftops." The Service recommends that the alternatives analysis include the installation of solar panels on all available rooftops at the WFF, including Main Base, Mainland, and Wallops Island. Placing solar panels on available rooftops will minimize the amount of land required for solar panel installation. The DEA should provide the amount of rooftop space currently available for solar panel installation. Another alternative that should be considered is placing solar panels above parking lots. This will also minimize additional impacts to habitat and natural and cultural resources.	Solar Panels	In its alternatives analysis, NASA considered rooftop installation of solar panels; however, due to most rooftops already being used or reserved for Heating, Ventilation, and Air-Conditioning (HVAC) systems, antennas, radars, weather tracking systems, etc., the use of rooftops does not present a viable large-scale solution. Even in the absence of the abovementioned use conflicts, there would be limited area available. Section 2.1.1.1 of the EA has been updated to include quantification of the total rooftop area at WFF. Since publishing the DEA, as suggested, NASA has expanded potential areas for solar panels to include existing parking lots, which minimize impacts on natural resources. Areas having elevated sensitivity for archaeological resources have already been removed from the areas identified for potential installation of solar panels.
74	Cindy Schulz	USFWS	<u>Section 2.3.1.2 Residential-Scale Turbines.</u> All five locations of these (*residential-scale*) turbines should be identified in the DEA so that effects can be analyzed.	Residential Scale Turbines	See response to Comment #22.

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75	Cindy Schulz	USFWS	<u>Section 2.3.4 Comparison of Costs among the Action Alternatives.</u> Table 6 on page 29 provides a comparison of costs for the alternatives. We recommend that NASA provide a breakdown or description of how these costs were derived and what was considered in these estimates. In addition, mitigation and monitoring costs should be included in the cost estimates if they are not already included. For example, the preferred alternative and alternative one will likely require compensation for wetland impacts and monitoring for impacts to birds, bats, and listed species. Lifetime monitoring may be a requirement of the preferred alternative and alternative one. Alternative two will likely have no mitigation or minimal monitoring costs.	Costs	Wetland compensation (planning, implementation, monitoring and reporting) and post-construction avian monitoring have already been included in the development of costs for the installation of the utility-scale turbines. The following text has been added to clarify Section 2.3.5 for the Final EA "(costs) includes the initial capital investment, equipment operation and maintenance costs, and environmental mitigation and monitoring costs..."
76	Cindy Schulz	USFWS	<u>Section 3.2.3.1 Birds.</u> The DEA does not adequately characterize the affected environment. We previously provided this information in our 2008 letter and recommend that it be incorporated into the draft EA to ensure an accurate description of baseline conditions.	Birds & Bats	Section 3.2.3.1 (Birds) of the EA has been updated to include more information regarding wildlife area designations and baseline conditions.
77	Cindy Schulz	USFWS	<u>Section 4.2.2.2 Wetlands.</u> The Service does not support the placement of wind turbines and associated infrastructure in wetlands. It is our opinion that the applicant has not provided sufficient information to demonstrate that this project is in compliance with the Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR 230.10).	Wetlands	NASA also is concerned about potential adverse effects on wetlands from the utility scale turbines and as such is no longer proposing their installation. In the Final EA NASA has identified the large scale solar option with two residential-scale turbines as its Proposed Action/Preferred Alternative. As noted in the Alternatives analysis in Section 4.2.2., if necessary NASA would obtain Section 404/401 permits for impacts on wetlands through the Joint Permit Application process with the State.
78	Cindy Schulz	USFWS	<u>Section 4.5.6.5 Terrestrial Wildlife and Migratory Birds.</u> In evaluating the cumulative effects of the WFF's proposed activities on terrestrial wildlife and migratory birds, NASA did not adequately analyze the significance of the effects. Of particular concern is that the majority of the proposed activities at WFF are not one-time events or temporary effects as suggested in the DEA. The proposed wind turbines will be in operation for 25 years, the beach renourishment project may occur every five years over a 50-year time period, one hundred and two rocket launches may occur each year, and other proposed launches will occur at the launch range and unmanned aerial system airstrip. The significance of effects should be determined based on the intensity of effects. Therefore, the magnitude, duration, frequency, and geographic extent of the effect should be considered when determining significance. We recommend that NASA provide additional detail on the criteria and thresholds that were used to determine the significance of effects to terrestrial wildlife and migratory birds.	Birds & Bats	As the Proposed Action in the Final EA would have much lower impact on the aforementioned resources, the resulting cumulative effects would be much less. Please refer to Sections 4.5 for a revised Cumulative Effects Analysis.
79	Cindy Schulz	USFWS	<u>Section 5.1.2 Birds and Bats.</u> Due to the significance of this region for birds and to support NASA's goal of setting an example in environmental stewardship, the Service recommends that NASA provide a detailed description of the mitigative measures that will be implemented to avoid or minimize impacts to birds and bats if the utility scale turbines are constructed. Such measure may include changing cut-in speed and the operational curtailment of the turbines.	Birds & Bats	See response to Comment # 14.
80	Cindy Schulz	USFWS	<u>Section 5.2 Monitoring.</u> If NASA continues to pursue the preferred alternative, the Service recommends that long term monitoring for the life of the project be conducted to determine the impact to federally listed species, migratory birds, and other trust resources.	Monitoring	See response to Comment # 14.

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81	Cindy Schulz	USFWS	<u>Section 5.2 Monitoring.</u> In addition to the utility scale turbines, monitoring may be warranted for the residential turbines depending on the location and number being built.	Monitoring	NASA would undertake post-construction monitoring of the residential-scale turbines as outlined in Section 5.2.1 of the Final EA.
82	Raymond T. Fernald	VA Department of Game and Inland Fisheries (VDGIF)	<u>Federal Endangered Species Act.</u> The DEA acknowledges the likely potential for the project to adversely impact these protected species (*Piping Plover and Red Knot*) in violations of the ESA, and demonstrates that the alternatives under consideration are not consistent with NASA's goal to "set an example of leadership in environmental stewardship and accountability by a Federal Agency."	T&E	See Response to Comment #14.
83	Raymond T. Fernald	VDGIF	<u>Federal Endangered Species Act.</u> Under Alternative Two, NASA makes no determination of potential effect (Executive Summary, page vi, Threatened and Endangered Species), but later identifies that the Proposed Action and all alternatives "may result in minor adverse impacts" to the Henslow's Sparrow, Upland Sandpiper, Piping Plover, Wilson's Plover, Red Knot, Peregrine Falcon, Gull-billed Tern, Bald Eagle, and Loggerhead Shrike (all state listed species; pages 122-126). This would suggest that there is potential for impact to the Piping Plover and Red Knot as well as the other state listed species.	T&E	See response to Comment #14. As the Proposed Action in the Final EA would be solar arrays located on the Main Base and two residential scale turbines, there would be no impacts to shorebirds or any other state or federally protected species. Section 4.3.3 reflects these changes.
84	Raymond T. Fernald	VDGIF	<u>Federal Endangered Species Act.</u> As stated on page i of the Executive Summary, "This EA encompasses a 25-year planning horizon..." An issue overlooked in this DEA is the current petition to list the eastern-small footed bat (<i>Myotis leibii</i>) and northern long-eared bat (<i>Myotis septentrionalis</i>); Center for Biological Diversity, January 2010) due to white-noise syndrome and the high likelihood that all cave dwelling bats in the east will be petitioned for listing, certainly within the life of this project. Of the two species currently petitioned for listing, the range of the northern long-eared bat includes the project site.	T&E	Comment noted. NASA also is concerned about potential adverse effects on bat species from the utility scale turbines and as such is no longer proposing their installation. In the Final EA NASA has identified the large scale solar option with two residential-scale turbines as its Proposed Action/Preferred Alternative. However, to portray the current status of these species, text has been added to Section 3.2.3.2 of the Final EA.
85	Raymond T. Fernald	VDGIF	<u>State Endangered Species Act.</u> The potential to impact multiple state listed species is of great concern to VDGIF both from an ecological and legal perspective. The DEA does not adequately address monitoring and mitigation of potential impacts to state listed species. See Appendices B, C, D, and E for guidance.	T&E: State	Please see responses to Comments #14 and 84.
86		VDGIF	The DEA also does not propose coordination with VDGIF concerning potential take of state listed species.	T&E:State	NASA has been coordinating with VDGIF throughout the entire EA process including scoping, public meetings, stakeholder meetings, and approval of pre-construction monitoring plans. Additionally, please refer to responses to Comments #14 and 84.
87	Raymond T. Fernald	VDGIF	<u>The Bald and Golden Eagle Protection Act.</u> The DEA identifies that the Proposed Action and all alternatives "may result in minor adverse impacts" to Bald Eagles. The high density and movement of eagles in this area elevates the likelihood of impact. The DEA does not adequately address monitoring and mitigation of potential impacts to eagles. See Appendices B, C, D, and E for guidance. The DEA also does not propose coordination with VDGIF concerning potential take of eagles.	T&E:State	See response to Comment #14. Chapter 5 has been revised to reflect monitoring and mitigation for the residential scale turbines. The closest known bald eagle nest is approximately 4 miles from either proposed residential-scale turbine location; therefore, no impacts are anticipated.
88	Raymond T. Fernald	VDGIF	<u>Migratory Bird Treaty Act.</u> Considering that several migratory bird routes converge just north of the site we can expect that the WFF facility will have fatality rates in excess of the Jersey Atlantic Wind (JAW) facility. In addition to birds, it is likely that the pattern of	Monitoring	Please see response to Comment #14.

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			concentration down the Eastern Shore will be similar with bats. A study of wind turbines off the coast of Sweden determined that insects are attracted to the white colored blades and bats followed (Ahlen et al., 2007; Elfland, et al. 2009). The DEA does not adequately address monitoring and mitigation of potential impacts to bird and bat species. See Appendices B, C, D, and E for guidance.		
89	Raymond T. Fernald	VDGIF	<u>USFWS Wind Turbine Advisory Guidelines</u> . The DEA contained no reference to the federal wind energy guidelines (USFWS 2003, 2009) which leads us to conclude that WFF chose to ignore the guidance they offered with regard to preliminary site evaluation and screening, risk assessment and pre-construction studies, despite prior recommendations made by VDGIF and other agencies to incorporate them early in NEPA process.	USFWS recommendations	Please see response to Comment #14.
90	Raymond T. Fernald	VDGIF	The VGDIF believes the Proposed Action (preferred alternative) and Alternative One have a high likelihood to result in violations of the Federal Endangered Species Act, the Virginia State Endangered Species Act, the Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act. In addition, these alternatives ignore the USFWS' 2003 recommendations for identifying appropriate areas for wind development as well as the new guidance from the USFWS Wind Turbine Advisory Committee (2009).	USFWS recommendations	Please see response to Comment #14.
91		VDGIF	While the Proposed Action and Alternative One and Two will meet the objectives set forth in the 2005 Federal Energy Policy Act, we do not believe that the alternatives advanced in the DEA "support NASA's goal to set an example of leadership in environmental stewardship and accountability by a Federal Agency."	Miscellaneous	Please see responses to Comments #14, 77, and 84.
92	Raymond T. Fernald	VDGIF	Alternative Two proposes a combination of residential-scale wind and solar panels. It is uncertain to what degree this alternative will impact wildlife, because residential-scale wind turbines have not been studied with respect to impacts to wildlife resources. Alternative Two may violate the same laws, for the same reasons described for the Proposed Action and Alternative One. However, certain aspects of Alternative Two are preferable because it implements the use of solar panels and the initial phased-development of the residential-scale wind component of the project is limited to the construction of one or two turbines, providing an opportunity for further study to determine impacts of residential-scale wind development and identify appropriate mitigation opportunities. Alternative Two provides a better opportunity for NASA to achieve the objectives set forth by the 2005 Federal EPA and to minimize potential violation of the above listed Acts, and laws, thereby supporting NASA's goal to set an example of leadership in environmental stewardship.	Residential Scale Turbines	Please see response to Comment #14.
93	Raymond T. Fernald	VDGIF	The DEA states the WFF Main Base has a sufficient amount of open space to install a system of solar panels capable of generating up to 10 gigawatt-hours (GWh) of electricity per year as mandated by 2005 Federal Energy Policy Act. Open space requirements could be further reduced by installing a portion of the solar panels on existing rooftops and other flat structures. A solar	Solar Panels	See response to Comment #73.

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			panel system would serve as an effective educational tool with minimal risk to wildlife; thus eliminating the need to construct residential wind turbines.		
94	Raymond T. Fernald	VDGIF	Lastly, going strictly solar would place WFF in compliance with most, if not all environmental laws and send a clear message to the public and stakeholders that WFF is serious about conserving the sensitive resources on Virginia's barrier islands.	Alternatives	See response to Comment #65.
95	Raymond T. Fernald	VDGIF	While the No Action Alternative would not support the 2005 EAct it would alleviate potential for violation of the Federal Endangered Species Act, the Virginia State Endangered Species Act, the Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act as well as impacts to birds and bats. This alternative would also follow the guidance as outline in both the USFWS 2003 wind siting recommendations and the USFWS Wind Turbine Advisory Committee (2009). In addition, this alternative would support "NASA's goal to set an example of leadership in environmental stewardship and accountability by a Federal Agency."	Alternatives	See response to Comment #65.
96	Raymond T. Fernald	VDGIF	We recommend conducting a more complete evaluation of solar panels and other potential alternative energy sources. Potential adverse impacts should be avoided and minimized where possible, through proper siting of power generating facilities and use of the best available technology.	Solar Panels	As described in the EA, NASA considered several alternatives to wind turbines and solar panels; however, these alternatives were dismissed for various reasons. See comment response number 25 regarding consideration of locations outside of the WFF property for installation of utility-scale wind turbines. Please also refer to responses to Comments # 14, 77, and 84.
97	Raymond T. Fernald	VDGIF	We recommend further development and analysis of additional alternatives that would implement energy-conservation measures to manage on-site energy usage and maximize the use of solar panels on existing rooftops and available upland-sites.	Alternatives	Section 1.4.2 has been revised to discuss NASA's \$25 million investment in energy efficiency improvements, the largest of which include: decentralization of the central steam plant and installation of new propane boilers in all facilities at the Main Base, lighting upgrades in all fixtures on the Main Base and all exterior lights on Wallops Island, HVAC upgrades in 12 buildings, and systematically performing a building tune-up program where building energy performance is optimized on a case-by-case basis, pursuing LEED Existing Buildings certification for 3 facilities at the Main Base. Through all of these improvements, WFF anticipates a reduction in energy intensity (measured in BTU's per square foot) by 25% compared to 2003, which is the baseline year of the EAct. Additionally, see response to Comment #73.
98	Raymond T. Fernald	VDGIF	We recommend further development of a slightly modified Alternative Two that includes construction of up to two residential-scale wind turbines for educational purposes, incorporates a study design to assess and mitigate the impacts of residential wind turbines, and implements maximum use of solar panels on existing rooftops and available upland-sites.	Alternatives	See response to Comment #14 and revised Section 5 of the Final EA.
99	Raymond T. Fernald	VDGIF	We recommend preparation of a Supplemental EA or Draft EIS to better address the potential impacts to all wildlife; if the Proposed Action, Alternative One, or Alternative Two are selected.	EIS	The Final EA has been developed to disclose the impacts from the project so that a decision can be made regarding whether or not these impacts are significant and a FONSI would be signed or whether an EIS should be prepared.
100		VDGIF comments from Virginia Department of Environmental Quality (VDEQ) letter	VDGIF states that the full impacts upon wildlife must be better assessed.	Birds & Bats	Since the release of the DEA, NASA has revised the Proposed Action to lessen impacts upon wildlife. Accordingly, NASA feels that the analysis of effects on wildlife discussed in the Final EA are commensurate with the scope of the revised Proposed Action. Consistent with an EA, the assessment of the effects of the Alternatives to the Proposed Action are sufficient to provide the decision-maker and reviewers a reasonable comparison among project options.
101		VDGIF	VDGIF recommends avoiding and minimizing potential adverse impacts, where possible, through proper siting of power generating	Miscellaneous	Comment noted.

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			facilities and use of the best available technology.		
102		VDGIF	VDGIF recommends implementing appropriate mitigation for those impacts that are unavoidable.	Miscellaneous	Comment noted.
103	Robert Cole	UACE	I concur with the comments submitted by the Fish and Wildlife Service regarding Purpose and Need.	Purpose and Need	Comment noted.
104	Robert Cole	USACE	<u>Section 4.5 Cumulative Impacts.</u> Lacks sufficient detail to address the impacts. The project descriptions are overviews and do not address specific impacts. Additional tables should be added to show: (1) the conversion of porous land to impervious/pavement and how the impacts were mitigated, (2) Energy consumption and what steps have been implemented to minimize impacts, (3) the areas NASA and tenant missions limit or restrict land, water, and aerial uses, and (3) energy consumption associated with the new structures	Cumulative	The Cumulative Effects analysis in Section 4.5 has been revised to address expected impacts from the new Proposed Action commensurate with an the contents of an EA.
105	Robert Cole	USACE	<u>Section 4.5 Cumulative Impacts.</u> Future impacts are not adequately addressed. For Example: (1) Several areas of Wallops Island were reserved from NASA's recent Mitigation Bank Proposal for future development/mission needs; (2) NASA has indicated that an electrical loop will be installed along the southern end of Wallops Island in part to facilitate future development; and (3) the Flight Facility Expansion project lists several structures and processes to be constructed/implemented but there are no impacts detailed.	Cumulative	See response to Comment #104.
106	Robert Cole	USACE	<u>Section 4.5 Cumulative Impacts.</u> Past activities seem to be missing several impacts. For Example (1) There have been several attempts to stabilize the ocean shoreline, but only the current proposal is named; (2) There is an existing runway on the southern end of the island, but it is not included in the past actions, (3) NAPALM testing was accomplished on the Island but the impacts associated with the testing are not listed.	Cumulative	See response to Comment #104.
107	Robert Cole	USACE	<u>Section 4.5 Cumulative Impacts.</u> The examples provided for Cumulative Impacts is not a complete listing of all NASA impacts.	Cumulative	See response to Comment #104.
108	Cody D. Walker	Virginia State Corporation Commission, Division of Energy Regulation	The Staff of the Virginia State Corporation Commission does not have any comments regarding the DEA for the proposed Wallops Flight Facility Alternative Energy Project. Please be apprised, however, that the proposed facility may require approval by the Virginia State Corporation pursuant to §56-580 D of the Code of Virginia if it does not qualify as a net metering facility pursuant to §56-594 of the Virginia Code.	Miscellaneous	Comment noted.
109	Cody D. Walker	Virginia State Corporation Commission, Division of Energy Regulation	Based on your representation that the wind facility would have a capacity of 4 MW, it would appear to exceed the 500kW net metering threshold. As such, the facility may be subject to §5G-580 D of the Code. If so, the facility must comply with 20VAC5-302-10. Specifically, the facility would have satisfy the following requirement: Construction of electric generating facilities with rated capacities of 5 MW or less may be undertaken without complying with the filing requirements established by this chapter. Persons desiring to construct such facilities shall (i) submit a letter to the Director of the Division of Energy Regulation stating the location, size and fuel type of the facility, and (ii) comply with all other	Compliance	Comment noted. Net metering is not planned for this project; therefore, the regulations mentioned in your comment do not apply.

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			requirements of federal, state and local law.		
110	Mary A. Colligan	National Oceanic and Atmospheric Administration (NOAA NMFS)	...as no in water work is proposed, no listed species will be affected by the proposed project. As such, no consultation pursuant to Section 7 of the Endangered Species Act of 1973, as amended, is required.	T&E	Comment noted.
111		VDEQ	In general, the Commonwealth of Virginia supports NASA's effort to expand its alternative energy sources at NASA Wallops Flight Facility. The development of alternative energy is consistent with the goals of the Virginia Energy Plan, which was developed in accordance with 2006 legislation (Title 67 of the Code of Virginia) that determined energy policy statements and objectives. One of its recommendations (page 11, 2007 Virginia Energy Plan) states that the federal government should expand its efforts to support energy efficiency and conservation, including increasing its investment in alternate energy development. Accordingly, reviewers support alternative energy development in general. However, reviewers indicated that Alternative 2 would have less impact than the preferred alternative.	Compliance	Comment noted. Alternative 2 identified in the DEA is NASA's Preferred Alternative in the Final EA.
112		VDEQ	The proposed project location on the Eastern Shore is within a significant migratory bird area that also supports breeding populations of numerous federally- and state-listed species. Conducting a more complete evaluation of solar panels and other potential alternative energy sources; avoiding and minimizing potential adverse impacts, where possible, through proper siting of power generating facilities and use of the best available technology, and implementing appropriate mitigation for those impacts that are unavoidable are recommendations that may help alleviate protected species concerns.	Birds & Bats	See response to Comment #14.
113		VDEQ	The proposed construction of wind turbines, especially those of utility scale, has the potential to adversely impact bats.	Birds & Bats	See response to Comment #84.
114		VDEQ	Each of the proposed site locations may overlap active or closed Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites. In addition, military munitions may be present in some locations.	MEC	NASA has identified the potential for MEC to be encountered at the site proposed for the residential-scale turbine at the Visitor's Center. As such, NASA would provide all persons working at the Visitor Center area with MEC training so that they would be informed as to what type of ordnance might be encountered there. Additionally, digging operations would be surveyed with a magnetometer and cleared. The excavation process would involve using the magnetometer to survey the first foot of soil, then digging out the first foot of soil, then re-surveying the second foot of subsoil, etc., to ensure that the boring/digging equipment does not hit or expose any unknown MEC. All suspected MEC would be inspected and handled by a trained specialist and properly disposed. This would likely continue for at least six to eight feet, or to bottom depth, if metal targets continue to be detected.
115		VDEQ	Numerous projects are planned for NASA Wallops, which cumulatively could result in significant impacts.	Cumulative	NASA has evaluated and disclosed cumulative impacts in Section 4.5 of the EA. NASA's management will review the EA to determine if impacts on any resources, including cumulative impacts, are significant and whether or not a Finding of No Significant Impact can be issued or an EIS should be prepared.
116		VDEQ	The DEQ Tidewater Regional Office (TRO) states that this project will require a permit from the VWP Permit Program. As such, a Joint Permit Application (JPA) should be submitted to Virginia Marine Resources of Commission (VMRC) for distribution and	Permitting	See response to Comment #77.

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			review by interested regulatory parties, including DEQ.		
117		VDEQ	DEQ TRO is concerned that numerous projects are planned for this facility and that it may not be appropriate to review them as individual, single and complete projects. This issue has been discussed with the project proponents previously and will need to be resolved prior to permit issuance.	Permitting	Comment noted. NASA will coordinate with DEQ TRO regarding permit requirements and resolution of TRO's concerns regarding separation of projects at WFF for permitting.
118		VDEQ	<p>In general, DEQ recommends that stream and wetland impacts be avoided to the maximum extent practicable. To minimize unavoidable impacts to wetlands and waterways, DEQ recommends the following practices:</p> <ul style="list-style-type: none"> • Operate machinery and construction vehicles outside of stream-beds and wetlands; use synthetic mats when in-stream work is unavoidable. • Preserve the top 12 inches of material removed from wetlands for use as wetland seed and root-stock in the excavated area. • Erosion and sedimentation controls should be designed in accordance with the most current edition of the Virginia Erosion and Sediment Control Handbook. <p>These controls should be in place prior to clearing and grading, and maintained in good working order to minimize impacts to state waters. The controls should remain in place until the area is stabilized.</p> <ul style="list-style-type: none"> • Place heavy equipment, located in temporarily impacted wetland areas, on mats, geotextile fabric, or use other suitable measures to minimize soil disturbance, to the maximum extent practicable. • Restore all temporarily disturbed wetland areas to pre-construction conditions and plant or seed with appropriate wetlands vegetation in accordance with the cover type (emergent, scrub-shrub or forested). The applicant should take all appropriate measures to promote revegetation of these areas. Stabilization and restoration efforts should occur immediately after the temporary disturbance of each wetland area instead of waiting until the entire project has been completed. • Place all materials which are temporarily stockpiled in wetlands, designated for use for the immediate stabilization of wetlands, on mats or geotextile fabric in order to prevent entry in state waters. These materials should be managed in a manner that prevents leachates from entering state waters and must be entirely removed within thirty days following completion of that construction activity. The disturbed areas should be returned to their original contours, stabilized within thirty days following removal of the stockpile, and restored to the original vegetated state. • All non-impacted surface waters within the project or right-of-way limits that are within 50 feet of any clearing, grading or filling activities should be clearly flagged or marked for the life of the construction activity within that area. The project proponent should notify all contractors that these marked areas are surface waters where no activities are to occur. 	Wetlands	See response to Comment #77.

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			<ul style="list-style-type: none"> Measures should be employed to prevent spills of fuels or lubricants into state waters. 		
119		VDEQ	<p>The Waste Division states that the report addresses solid and hazardous waste issues but does not include a search of waste-related data bases. A Geographic Information System (GIS) database search did not reveal any waste sites within a half-mile radius that would impact or be impacted by the subject site. The Waste Division staff performed a cursory review of its data files and determined that there are several hazardous and formerly used defense sites (FUDS) located within the same zip code; however, their proximities to the subject site are unknown: Hazardous Waste, NASA GSFC Wallops Flight Facility, VA8800010763 LOG (Active), VA7800020888 LQG (Active) and VA7800020888 TSD (Active); FUDS, Wallops Island (CO3VA0301, VA9799F1697) The following Web site may prove helpful in locating additional information for these identification numbers: www.epagov/enviro/htrni/rcris/rcris_quetyjava.html.</p>	Compliance	Comment noted.
120		VDEQ	<p>The DEQ TRO states that multiple petroleum releases have been reported at the Wallops Flight Facility. One of the closed petroleum cases (PC# 1995-2405) is located about 1,000 feet south of the proposed utility scale wind turbines site. This release, associated with Building V-10, should not impact this proposed wind turbine site.</p>	Compliance	Comment noted.
121		VDEQ	<p>DEQ has the following recommendations: Report evidence of a petroleum release, if discovered during construction of this project, to Lynne Smith at (757) 518-2055 or Gene Siudyla at (757) 518-2117 with the DEQ TRO. • Petroleum-contaminated soils generated during construction of this project must be characterized and disposed of properly. • DEQ encourages all construction projects and facilities to implement pollution prevention principles, including: the reduction, reuse and recycling of all solid wastes generated; and o the minimization and proper handling of generated hazardous wastes.</p> <ul style="list-style-type: none"> Direct questions regarding this project to Tom Madigan at (757) 518-2115 or submitted documentation, if necessary, at DEQ TRO, 5636 Southern Blvd., Virginia Beach, Virginia 23462. • Care should be taken when excavating in the locations proposed for the utility-scale wind turbines as military munitions may be present. Prior to initiating any construction, excavation or dredging activities on Wallops Island, Mainland or Main Base property, contact <ul style="list-style-type: none"> T.J. Meyer, NASA WFF Manager of Environmental Restoration (available by phone at 757-824-1987), for information concerning any CERCLA or Military Munitions Response Program (MMRP) obligations at or near areas adjacent to Facility CERCLA/MMRP sites and Sher Zaman, Corps Remediation Project Manager for Wallops FUDS (available by phone at 410-962-3134), for information concerning CERCLA/MMRP obligations at or near Wallops FUDS sites. 	Compliance	Comment noted.

Comment No.	Commenter Name	Commenter Affiliation	Comment	Topic	Response
122		VDEQ	DEQ recommendation for water conservation: <ul style="list-style-type: none"> • Grounds should be landscaped with hardy native plant species to conserve water as well as minimize the need to use fertilizers and pesticides. • Convert turf to low water-use landscaping such as drought resistant grass, plants, shrubs and trees. 	Compliance	Comment noted.
123		VDEQ	DEQ recommendation: Should maintenance activities require the use of herbicides or pesticides, these chemicals should be used in accordance with the principles of integrated pest management.	Compliance	Comment noted.
124		Department of Conservation and Recreation (DCR)	NASA must prepare and implement an erosion and sediment control plan to ensure compliance with state law and regulations. The erosion and sediment control plan is submitted to the DCR regional office that serves the area where the project is located for review for compliance. NASA is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites and other mechanisms consistent with agency policy.	Compliance	Comment noted.
125		DCR	DCR DCBLA reviewed the proposed development of wind turbines at the Wallops Island facility in Accomack County. The subject property is located on property specifically excluded from Accomack County's designated Chesapeake Bay Preservation Areas (CBPA) when the County extended their CBPAs to include areas which drain to the Atlantic Ocean in 2009. Therefore, there are no requirements necessary for consistency with the Chesapeake Bay Preservation Act.	Compliance	Comment noted.
126		DCR	DCR states that it strongly supports the use of alternative energy sources in the Commonwealth. Because the proposed project site is an area of global ecological significance, DCR supports sound planning as the project moves forward. However, DCR is concerned that 200-250 foot towers may have an adverse impact on the migratory birds, especially when the significance of the Delmarva peninsula to the Atlantic Flyway is considered. Potential impacts to birds and bats can result from collisions with wind turbine monopoles and blades. Indirect impacts can result from alteration of habitat causing changes in foraging, breeding and migratory behaviors (Kunz et al, 2007).	Birds & Bats	Please see responses to Comments #14 and 84.
127		DCR	The proposed construction of wind turbines, especially those of "utility scale," has the potential to adversely impact resident and migratory birds and bats.	Birds & Bats	Please see responses to Comments #14 and 84.
128		DCR	DCR Recommendations: <ul style="list-style-type: none"> • Contact Rene Hypes with DCR Division of Natural Heritage (DNH) at (804) 371-2708 to secure updated information on natural heritage resources if a significant amount of time passes before the project is implemented since new and updated information is continually added to the Biotics Data System. • If the "No Build" alternative is not feasible, DCR recommends Alternative Two (smaller residential scale turbines and solar panels) as the preferred alternative since it would have the least impact on natural heritage resources. The smaller turbines and the ability of the hybrid system to produce energy utilizing the solar panels instead of the turbines during low 	Compliance	Comment noted. Since issuing the DEA, NASA has changed its Preferred Alternative to large-scale solar and two residential-scale wind turbines on the mainland.

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			<p>wind speeds would potentially reduce bird/bat mortality.</p> <ul style="list-style-type: none"> Should Alternative 1, the "utility scale" wind turbines be installed on Wallops Island, DCR supports the two year post-construction monitoring study of bird/bat mortality and appropriate mitigation for impacts, possibly including seasonal low wind shutdowns. Due to the legal status of natural heritage resources documented in this area, DCR also recommends coordination with the USFWS. 		
129		Virginia Coastal Resources Management Program (VCP)	The VCP states that while NASA's efforts to demonstrate the use of alternative energy are laudable, the proposed alternative, which would put two utility-scale turbines on a barrier island, presents coastal resource conflicts.	Alternatives	Please see responses to Comments #14, 77, and 84.
130		VCP	Other locations in Virginia may be more suitable for wind energy production (see attached comments for details), according to the VCP. Erecting wind turbines on a barrier island within such an important bird habitat may cause a conflict with ongoing preservation efforts.	Alternatives	See response to Comment #14.
131		VCP	According to the VCP, Alternative Two appears to have fewer impacts than the preferred alternative. Demonstrating the use of solar panels would achieve both a reduction in greenhouse gases and an energy source with virtually no impacts on this hemispherically important bird habitat.	Alternatives	Please see responses to Comments #14.
132		Department of Historic Resources (DHR)	DHR states based on information received regarding the proposed project, including the EA distributed by DEQ, it is unable to make an informed decision concerning all effects of the proposed undertaking. In addition, the Area of Potential Effect for the proposed residential-scale wind turbines has not been identified.	Cultural	See response to Comment #51.
133		DHR	DHR concurs with the determination that the proposed utility-scale wind turbines will not directly affect historic properties and with the determination that the proposed utility-scale wind turbines will have an indirect effect on the NRHP-eligible Coast Guard Life Saving Station and associated Observation Tower.	Cultural	Comment noted.
134		DHR	DHR Recommendations: • DHR requests a detailed description of what alternatives NASA has explored to avoid and/or minimize the effect to above-ground historic properties. • DHR recommends that NASA consult with DHR to fully identify and assess the effects of the proposed residential-scale wind turbines. • DHR requests a list of Native American tribes (recognized by the state and federal governments) that have an ancestral interest in Virginia that NASA contacted regarding this proposed project.	Cultural	See response to Comment #51.
135		Virginia Department of Transportation (VDOT)	VDOT finds that a preliminary review does not indicate any negative impacts to the transportation system at this time and has no objections to the proposed improvements. VDOT concludes that any additional traffic or traffic disruptions regarding the proposed project are negligible.	Transportation	Comment noted.
136		Virginia Department of	DOAv suggests that the turbines and their locations be studied in order to determine impacts to the airspace or on the safety and	Miscellaneous	All Alternatives were developed in close consultation with both the Wallops Airfield Manager and FAA to ensure that siting was consistent with Part 77 obstruction

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		Aviation (DOAv)	utility of aircraft operations at the Wallops Flight Facility.		requirements.
137		Virginia Department of Health (VDH)	VDH states that potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility.	Public Water Distribution	Comment noted. Based on the analysis in the EA, NASA does not anticipate any impacts to public water distribution systems or sanitary sewer collection systems.
138		Accomack County from VDEQ Letter	Accomack County states that on March 5, 2010, it sent comments to NASA. According to the County, Wallops Island and the majority of the NASA Main Base are in an agricultural zoning district as opposed to being in an industrial zone, as indicated by the EA. Only the area near the Marine Science Consortium (part of the Wallops Research Park) is zoned Industrial.	Miscellaneous	The Final EA has been revised to correct the error regarding inaccurate zoning for WFF.
139		Accomack County from VDEQ Letter	Accomack County supports development of alternative energy sources and is looking forward to seeing this project proceed.	Support	Comment noted.