APPENDIX L
SUPPLEMENTAL TECHNICAL ANALYSIS

(Prepared in support of the NEPA Final EIS)

Na Pua Makani Wind Project Technical Analysis of Modified Proposed Action Option

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Table of Contents

1.0 INTRODUCTION 1
1.1 Introduction 1
1.2 Description of Modified Proposed Action Option In Comparison to Proposed Action 2
1.3 Analysis Approach 2
2.0 RESOURCES EVALUATED IN THE DEIS 3
2.1 Geology and Soils 3
2.2 Hydrology and Water Resources 4
2.3 Air Quality and Climate Change 6
2.4 Noise 6
2.5 Hazardous and Regulated Materials and Wastes 7
2.6 Natural Hazards 8
2.7 Vegetation 9
2.8 Wildlife 10
2.9 Threatened and Endangered Species 11
2.10 Socioeconomics 12
2.11 Historic, Archaeological, and Cultural Resources 13
2.12 Land Use 14
2.13 Agriculture 15
2.14 Recreation and Tourism 15
2.15 Visual Resources 16
2.16 Transportation 19
2.17 Public Health 20
2.18 Environmental Justice 22
2.19 Public Infrastructure 22
2.20 Military Interests 24
3.0 Conclusion 25

List of Tables

Table 1. Comparison of Project Components and Disturbance Areas 3
Table 2. Evaluation of Modified Proposed Action Option Impacts to Geology and Soils 4
Table 3. Evaluation of Modified Proposed Action Option Impacts to Hydrology and Water Resources 5
Table 4. Evaluation of Modified Proposed Action Option Impacts to Air Quality and Climate Change 6
Table 5. Evaluation of Modified Proposed Action Option Impacts to Noise 7
Table 6. Evaluation of Modified Proposed Action Option Impacts to Hazardous and Regulated Materials and Waste 8
Table 7. Evaluation of Potential Natural Hazards Impacting the Modified Proposed Action Option Impacts 9
Table 8. Evaluation of Modified Proposed Action Option Impacts to Vegetation 10
Table 9. Evaluation of Modified Proposed Action Option Impacts to Wildlife 11
Table 10. Evaluation of Modified Proposed Action Option Impacts to Threatened and Endangered Species 12
Table 11. Evaluation of Modified Proposed Action Option Impacts to Socioeconomic Resources 13
Table 12. Evaluation of Modified Proposed Action Option Impacts to Historic, Archaeological, and Cultural Resources 14
Table 13. Evaluation of Modified Proposed Action Option Impacts to Land Use 15
Table 14. Evaluation of Modified Proposed Action Option Impacts to Agriculture 15
Table 15. Evaluation of Modified Proposed Action Option Impacts to Recreation and Tourism 16
Table 16. Modified Proposed Action Option: Visual Impact Intensity for Viewpoints 17
Table 17. Evaluation of Modified Proposed Action Option Impacts to Visual Resources 19
Table 18. Evaluation of Modified Proposed Action Option Impacts to Transportation 20
Table 19. Evaluation of Modified Proposed Action Option Impacts to Public Health 21
Table 20. Evaluation of Modified Proposed Action Option Impacts to Environmental Justice 22
Table 21. Evaluation of Modified Proposed Action Option Impacts to Public Infrastructure 23
Table 22. Evaluation of Modified Proposed Action Option Impacts to Military Interests 24

1.0 INTRODUCTION

1.1 Introduction

Na Pua Makani Power Partners, LLC (NPMPP), a wholly owned subsidiary of Champlin Hawaii Wind Holdings, LLC, proposes to construct and operate the proposed Na Pua Makani Wind Project (Project). The Draft Environmental Impact Statement (DEIS) was published the Office of Environmental Quality and Control's (OEQC) The Environmental Notice on June 8, 2015, and a notice of availability of the DEIS was published on June 12, 2015, in the Federal Register by USFWS (80 FR 33535-33537) and on the same date by US EPA (80 FR 33519) in accordance with requirements set forth under the Hawaii Environmental Policy Act (HEPA; HRS § 343-3) and NEPA (40 CFR 1506.6) implementing regulations. Public comments on the DEIS were accepted during the 45-day and 60-day State and Federal public comment periods, respectively.

In response to public comments on the DEIS related to visual impacts, NPMPP reevaluated the proposed turbine locations and turbine models considered under the Proposed Action (up to 10 turbines) with the goal of reducing the number of turbines by considering turbines with larger generating capacities. Through this effort, NPMPP was able to reduce the maximum number of turbines needed to meet the target generating capacity for the Project from 10 turbines to 9 turbines. Depending on the selection of the final turbine model, the number of turbines may be as few as eight. This modification takes advantage of recent technological advancements that have resulted in the availability of uprated versions of turbine models that are larger, more efficient, have increased generating capacity, and are better suited for the moderate to low wind conditions of the wind farm site than previous models. These modifications are evaluated here as the Modified Proposed Action Option (Alternative 2a).

The purpose of this technical report is to compare the Proposed Action as presented in the DEIS and the Modified Proposed Action Option to determine whether or not the modification is presents significant new information relative to the DEIS. To make this determination, the technical analysis applies the methods and standards outlined in the DEIS and indicates whether the modification would result in a significant new impact or a significantly more adverse impact not disclosed in the DEIS. Should the impacts of the Modified Proposed Action Option fall into either of these categories, this would indicated the potential need to publish a supplemental NEPA document. If the Modified Proposed Action Option does not constitute new or significantly different information then this provides justification for evaluating the modification as an option to the Proposed Action in the Final EIS.

NPMPP is preparing a Habitat Conservation Plan (HCP) and pursuing and Incidental Take Permit (ITP) from the U.S. Fish and Wildlife Service (USFWS). The federal proposed action (approval of the HCP and issuance of the ITP) is the same under the Proposed Action and the Modified Proposed Action Option. Therefore, the HCP and issuance of the ITP are not discussed further here.

As set forth below, this technical report concludes that the Modified Proposed Action Option would not result in any significant new impact or a significantly more adverse impact than already identified in the DEIS. The analysis supporting the evaluation of these modifications for each environmental topic is provided in Section 2.0. See Section 3.0 for a detailed explanation of this report's conclusions and recommendations for moving forward.

1.2 Description of Modified Proposed Action Option In Comparison to Proposed Action

The Modified Proposed Action Option would include up to 9 turbines and depending on the final turbine model selected may be as few as eight turbines. To meet the minimum required generating capacity for the project of approximately 25 megawatts, these turbines would be larger and more efficient, each with a greater generating capacity than Alternative 2 under the Proposed Action. By eliminating one turbine and the associated access road and collection line, the Modified Proposed Action Option would have a smaller footprint, thereby reducing the amount of temporary and permanent disturbance associated with the Project. All other Project facilities, which include the associated foundations and transformers; an underground electrical collection system; up to three meteorological (met) towers; access roads; construction staging areas; an operations and maintenance building and associated storage yard; a transmission line; and an onsite substation would be the same as under the Proposed Action (see Chapter 2 of the EIS for details).

Table 1 provides a comparison of the turbine model dimensions and project footprint between the Proposed Action and the Modified Proposed Action Option. The Best Management Practices (BMPs) and other avoidance and minimization measures described in Chapter 2 and Chapter 4 of the EIS would also apply to Modified Proposed Action Option and are therefore not discussed further in this technical report.

1.3 Analysis Approach

The analysis presented in this technical report applies the applicable methodologies and standards outlined in Chapter 4 of the DEIS and indicates whether the Modified Proposed Action Option would result in a significant new impact or a significantly more adverse impact than the Proposed Action. The impact issues identified under each resource in the DEIS are evaluated in this analysis and a summary impact category is applied to each impact issue. The impact categories are defined in Chapter 4 of the DEIS and include: negligible, minor, moderate, or major. Cumulative Effects will be the same for both the Proposed Action and the Modified Proposed Action Option; therefore, they are not discussed in this report.

The evaluation here assumes a 9-turbine Project. If only eight turbines were constructed, all impacts that are based on turbine number would be incrementally reduced due to the removal of one turbine and resulting smaller footprint of the Project. That is, there would be less ground disturbance and comparable or reduced visual, shadow flicker, and noise impacts. Impacts to socioeconomics, air quality, natural hazards, public infrastructure and services and other resources which would not change with the removal of one turbine would be the same for an 8- or 9-turbine

Project. The decision to construct an 8- or 9-turbine Project would be ultimately driven by the turbine model selected. This decision is dependent on turbine suitability for the wind regime (based on ongoing wind data collection), consideration of other site-specific factors, the availability and cost of the turbine models, and other factors. Ultimately, the project must produce up to approximately 25 MW of energy; therefore, generating capacity of the individual turbine model would determine the need for 8 or 9 turbines.

Table 1. Comparison of Project Components and Disturbance Areas

Description	Measurement	
Wind Turbine Component	**Proposed Action**	**Modified Proposed Action Option**
Power generation	Up to 3.3 MW[1]	Up to 3.45 MW[1]
Tower height	Up to 302 feet (92 meters)	Up to 443 feet (135 meters)[2]
Rotor type	3-bladed, horizontal axis	3-bladed, horizontal axis
Rotor diameter	Up to 384 feet (117 meters)	Up to 427 feet (130 meters)
Blade length	Up to 187 feet (57 meters)	Up to 208 feet (63 meters)
Number of blades	3	3
Total height above ground	Up to 512 feet (156 meters)	Up to 656 feet (200 meters)
Rotor swept area	Up to 115,723 feet^2 (10,751 meters^2)	Up to 143,160 feet^2 (13,300 meters^2)
Rotor speed	6-16 rotations per minute	6-16 rotations per minute
Cut -in wind speed	10 ft/s (3 m/s)	10 ft/s (3 m/s)
Cut-out wind speed	Up to 82 ft/s (25 m/s)	Up to 82 ft/s (25 m/s)
Project Footprint	**Proposed Action**	**Modified Proposed Action Option**
Total Area of Permanent Site Disturbance	59.9 acres (24.2 hectares)	56.7 acres (22.9 hectares)
Total Area of Site Disturbance During Construction	89.0 acres (36.0 hectares)	84.5 acres (34.2 hectares)

ft/s = feet per second; m/s = meters per second
[1]Should the turbine manufacturers make available up-rated versions of existing turbine models prior to construction, they will be considered for use in this project.
[2]To meet City and County of Honolulu setback requirements (a distance equivalent to the maximum turbine blade tip height), if the largest turbine model under consideration were selected hub heights of individual turbines would range from approximately 85 to 135 meters (blade lengths would be the same).

2.0 RESOURCES EVALUATED IN THE DEIS

2.1 Geology and Soils

Direct effects on geology and soils from the Modified Proposed Action Option would be less than the Proposed Action due to the reduced Project footprint. The Modified Proposed Action Option would disturb up to 84.5 acres (34.2 hectares) during construction, of which 56.7 acres (22.9 hectares) would be disturbed over the long-term during Project operation. The Proposed Action would disturb up to 89.0 acres (36.0 hectares), of which 59.9 acres (24.2 hectares) would be disturbed over the long-term during Project operation. Indirect effects such as impacts to threatened or endangered plant species or sensitive ecosystems, or long term loss of productivity or vegetative growth from compaction or mixing of soils would be the same under the Proposed Action and the Modified Proposed Action Option.

No new impacts or significantly more adverse impact are anticipated from the Modified Proposed Action Option (see Table 2 for an evaluation of each geology and soils impact issue identified in the DEIS). For the impact issues of drainage, erosion, and loss of agricultural land or soil productivity,

the Modified Proposed Action Option would result in slightly reduced impacts compared to the Proposed Action due to a decrease in the total area of temporary and permanent ground disturbance.

Table 2. Evaluation of Modified Proposed Action Option Impacts to Geology and Soils

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Geologic resources and hazards	Negligible	Negligible	No change in impact. No significant geologic features or mineral resources with economic value are known or expected to occur in the wind farm site; earthquake or seismic activity in the wind farm site is not anticipated.
Drainage patterns and slope failure	Minor	Minor	The Modified Proposed Action Option would have less impact on drainage patterns due to the reduction of the total area of temporary and permanent ground disturbance. (See Preliminary Drainage Study in Appendix H.)
Erosion	Minor	Minor	The Modified Proposed Action Option would have less possibility for erosion due to the reduction of the total area of temporary and permanent ground disturbance.
Sensitive species or ecosystems	Negligible	Negligible	No change in impact. There would be no impact to listed plant species or sensitive ecosystems as none occur at the wind farm site.
Loss of agricultural land or soil productivity	Minor	Minor	The Modified Proposed Action Option would impact less prime agricultural lands due to the reduction of the total area of temporary and permanent ground disturbance. Under the Proposed Action, approximately 12.6 acres (5.1 hectares) of the Prime Agricultural Lands (as classified under the ALISH system by the Hawaii State Department of Agriculture 1977) would be impacted over the long-term, through the life of the Project. Under the Modified Proposed Action Option, approximately 9.4 acres (3.8 hectares) of the Prime Agricultural Lands would be impacted over the long-term, through the life of the Project.

2.2 Hydrology and Water Resources

Direct effects on hydrology and water resources from the Modified Proposed Action Option would be less than the Proposed Action due to the decreased area of disturbance and area of impervious surfaces. The Modified Proposed Action would result in up to approximately 9.1 acres (3.7 hectares) of impervious surfaces in the wind farm site, which includes 9 acres (3.6 hectares; 99 percent) of gravel surfaces which are semi-pervious. Proposed Action would result in up to approximately 10.1 acres (4.1 hectares) of impervious surfaces in the wind farm site, which includes 10 acres (4.1 hectares; 99 percent) of gravel surfaces which are semi-pervious. The net increase in stormwater would also be less under the Modified Proposed Action Option (10.9 cubic feet per second) compared to the Proposed Action (11.9 cubic feet per second).

No new impacts or significantly more adverse impact are anticipated from the Modified Proposed Action Option (see Table 3 for an evaluation of each hydrology and water resources impact issue identified in the DEIS). For the impact issues of drainage, contamination of surface waters, and alteration of surface water quality, the Modified Proposed Action Option would result in slightly less impacts than the Proposed Action due to a decrease in the total area of temporary and permanent ground disturbance and decrease in impervious or semi-pervious surfaces.

Table 3. Evaluation of Modified Proposed Action Option Impacts to Hydrology and Water Resources

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Impacts to wetlands and other waters of the U.S.	Minor to Moderate	Minor to Moderate	No change in impact. There are no wetlands within the wind farm site; therefore the Modified Proposed Action Option would have no direct or indirect impact on wetlands. Three jurisdictional streams run through the wind farm site; however the project footprint under both the Proposed Action and Modified Proposed Action Option is designed to avoid impacts to these streams.
Alteration of existing drainage patterns	Negligible	Negligible	The Modified Proposed Action Option would have less impact on drainage patterns due to the reduction of the total area of temporary and permanent ground disturbance. (See the Preliminary Drainage Study in Appendix H of the EIS.)
Contamination of surface water quality from increased erosion, sedimentation, stormwater runoff and/or pollutants.	Minor	Minor	The Modified Proposed Action Option would have less possibility for surface water contamination from erosion, sedimentation, stormwater runoff and/or pollutants due to the reduction of 3.2 acres (1.3 hectares) in the total area of permanent ground disturbance and a reduction of 1 acre (0.4 hectares) in semi--pervious surfaces.
Alteration of surface water quality resulting in long-term loss or use by humans or aquatic wildlife and plants.	Minor	Minor	No change in impact. The Modified Proposed Action Option's smaller Project footprint and total impermeable area would reduce the impacts to surface water quality in comparison to the Proposed Action but it would not measurably change the potential long-term loss of use by humans or aquatic wildlife or plants.
Decrease in available groundwater or groundwater recharge	Negligible	Negligible	No change in impact. The water requirements for construction and operation under the Modified Proposed Action Option would not change.
Degradation of ground water quality	Negligible	Negligible	No change in impact. The Spill Prevention, Containment, and Countermeasures (SPCC) Plan described under the Proposed Action (Section 4.4.3 of DEIS) would be prepared for the Modified Proposed Action Option to ensure adverse impacts to groundwater quality from construction are avoided.

2.3 Air Quality and Climate Change

Direct or indirect effects on air quality and climate conditions from the Modified Proposed Action Option would be the same as the Proposed Action. There may be a slightly reduced amount of air pollutant emissions and fugitive dust levels associated with construction under the Modified Proposed Action Option due to the decrease in the number of turbines; however, this reduction would be negligible.

No new impacts or significantly more adverse impacts to air quality or climate conditions are anticipated from the Modified Proposed Action Option. See Table 4 for an evaluation of each air quality and climate impact issue identified in the DEIS.

Table 4. Evaluation of Modified Proposed Action Option Impacts to Air Quality and Climate Change

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Violations of State or Federal air quality standards as a result of construction activity or traffic	No Impact	No Impact	No change in impact. Emissions and increased fugitive dust levels would not violate State or Federal air quality standards under either the Modified Proposed Action Option or the Proposed Action.
Greenhouse gas emissions from Project construction	Minor	Minor	No change in impact. Construction equipment and vehicle emissions are anticipated to be the same under both the Modified Proposed Action Option and the Proposed Action.
Greenhouse gas emissions from Project operation	Negligible Adverse/Moderate Beneficial	Negligible Adverse/Moderate Beneficial	No change in impact. Emission of green-house gasses is anticipated to be the same under both the Modified Proposed Action Option and the Proposed Action.

2.4 Noise

Direct and indirect effects of noise from the Modified Proposed Action Option would be similar to the Proposed Action, only varying in the location of where construction activities would take place within the wind farm site (i.e., construction only occurring at a maximum of nine turbine pad locations rather than 10). Like Alternative 2, construction noise is likely to exceed HAR 11-46 limits at some TMKs in the acoustic analysis area under Alternative 2a and; therefore, a permit from the DOH would likely be required.

Direct and indirect effects of operational noise from the Modified Proposed Action Option would be similar to those described under the Proposed Action. Impacts from Low frequency noise (LFN) and infrasound (IS) would be the same under Alternative 2a as under Alternative 2, because the nearest residence to a proposed wind turbine is the same under both alternatives. Operational broadband (dBA) sound pressure levels for the Modified Proposed Action Option; however, were calculated based on a total of nine Siemens SWT 3.3-130; whereas operational broadband (dBA) sound

pressure levels for the Proposed Action were based on two Vestas V110-2.0 and eight Siemens SWT 3.0-113 turbines. Increases at the most sensitive Zone A TMKs are predicted to be slightly less under Alternative 2a (no more than 3 dBA over existing sound levels) than under Alternative 2 (no more than 4 dBA over existing sound levels). Similar to the Proposed Action, the operational noise analysis for the Modified Proposed Action Option demonstrates compliance with HAR 11-46 (see Appendix D of the EIS for details).

No new impacts or significantly more adverse impacts related to noise are anticipated from the Modified Proposed Action Option. See Table 5 for an evaluation of each noise impact issue identified in the DEIS.

Table 5. Evaluation of Modified Proposed Action Option Impacts to Noise

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Audible noise	Minor	Minor	No change in impact. The Modified Proposed Action Option would result in a slight decrease in operational noise impacts.
Low frequency noise/infrasound	Negligible	Negligible	No change in impact. Low frequency noise/infrasound impacts would be the same under both the Modified Proposed Action Option and the Proposed Action (no impacts as sound levels would be below the threshold of human hearing). There would be no change in low frequency noise/infrasound levels.

2.5 Hazardous and Regulated Materials and Wastes

Direct or indirect effects from use of hazardous materials, solid waste and petroleum projects under the Modified Proposed Action Option would be the same as the Proposed Action. There may be a reduced amount of hazardous materials, solid waste, or petroleum products generated or used under the Modified Proposed Action Option due to the decrease in the number of turbines; however this reduction would be negligible.

No new impacts or significantly more adverse impacts are anticipated from the Modified Proposed Action Option as the result of the transport, storage, use and disposal of hazardous materials, solid waste and petroleum products. See Table 6 for an evaluation of each hazardous and regulated materials and waste impact issue identified in the DEIS.

Table 6. Evaluation of Modified Proposed Action Option Impacts to Hazardous and Regulated Materials and Waste

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Routine use, storage and transport of hazardous materials	Minor	Minor	No change in impact. The impacts as the result of the transport, storage, use, and disposal of hazardous materials during the construction and operation of the Modified Proposed Action Option would be similar to those discussed under the Proposed Action in the DEIS.
Accidental spills and releases	Minor	Minor	No change in impact. The potential for accidental releases or spills under the Modified Proposed Action Option would be the same as the Proposed Action.
Worker exposure to chemicals exceeding OSHA limits	Minor	Minor	No change in impact. The potential for accidental worker exposure to chemicals under the Modified Proposed Action Option would be the same as the Proposed Action.
Disturb existing contamination or improper disposal	Minor	Minor	No change in impact. The potential disturbance of existing contamination during construction of the Modified Proposed Action Option would be similar to the Proposed Action.
Vandalism	Minor	Minor	No change in impact. The risk of vandalism would be the same under the both the Modified Proposed Action Option and the Proposed Action.

2.6 Natural Hazards

Construction and operation of the Project could be adversely affected by a natural hazard such as a hurricane, tsunami, or earthquake. However, the occurrence rates for these natural hazards on Oahu is very low. Table 7 evaluates each impact issue identified in the DEIS under this resource. There would be no change in potential impacts of natural hazards to the Project under the Modified Proposed Action Option.

Table 7. Evaluation of Potential Natural Hazards Impacting the Modified Proposed Action Option Impacts

Impact Issues	Summary of Impact		Evaluation of whether Impacts to the Modified Proposed Action Option are New or More Adverse Compared to the Proposed Action
	Proposed Action	Modified Proposed Action Option	
Hurricanes and tropical storms	None expected/negligible	None expected/negligible	No change in impact. Impacts to construction and operation of the Project from natural hazards under the Modified Proposed Action Option are the same as those described for the Proposed Action.
Tsunamis	Negligible	Negligible	
Earthquakes and seismicity	None expected/negligible	None expected/negligible	
Flooding	Minor	Minor	
Wildfire	Negligible	Negligible	

2.7 Vegetation

Direct effects to vegetation communities from Project construction include the physical destruction or degradation of vegetation and vegetation communities. The Modified Proposed Action Option would have less direct effects on vegetation than the Proposed Action due to the decrease in Project footprint. Construction and operation of the Project under the Modified Proposed Action Option would result in approximately up to 84.5 acres (34.2 hectares) of impacted vegetation, including 56.7 acres (22.9 hectares) of long-term impacts. Construction and operation of the Project under the Proposed Action would result in approximately 89.0 acres (36.0 hectares) of impacted vegetation, including 59.9 acres (24.2 hectares) of long-term impacts.

Indirect impacts to vegetation communities from Project construction include the introduction and spread of noxious weeds and the potential increased risk of wildfire, both of which can impact and alter vegetation communities within the wind farm site. Indirect impacts are anticipated to be the same for the Modified Proposed Action Option as they are for the Proposed Action.

No new impacts or significantly more adverse impacts are anticipated from the Modified Proposed Action Option (Table 8). For the impact issues of loss of plant species populations or loss of native plant communities, the Modified Proposed Action Option would result in slightly reduced impacts compared to the Proposed Action due to a decrease in the total area of temporary and permanent ground disturbance.

Table 8. Evaluation of Modified Proposed Action Option Impacts to Vegetation

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Introduction or spread of noxious weeds	Minor	Minor	No change in impact. The Modified Proposed Action Option has the same potential to increase the introduction and spread of noxious weeds as the Proposed Action.
Loss to any population of plant species resulting in proposal for listing or listing	Negligible	Negligible	The Modified Proposed Action Option would have less impact on existing plant species populations due to the reduction of the total area of temporary and permanent ground disturbance.
Loss of native plant communities	Minor	Minor	The Modified Proposed Action Option would have less impact on native plant communities due to the reduction of the total area of temporary and permanent ground disturbance.
Fire	Minor	Minor	No change in impact. The Modified Proposed Action Option has the same potential to increase the risk of wildfire as the Proposed Action.

2.8 Wildlife

Direct effects to wildlife from Project construction activities include injury or mortality (e.g., collision with construction equipment), habitat removal and alteration, and noise and disturbance. Indirect effects to wildlife include the introduction and spread of non-native plant and animal species. Direct impacts would be slightly less under the Modified Proposed Action Option than under the Proposed Action due to the reduction in the total area of temporary and permanent ground disturbance (see Section 2.7). Indirect impacts would be the same for the Modified Proposed Action Option as they are for the Proposed Action. The direct and indirect effects of the Habitat Conservation Plan actions would benefit wildlife over the long term through the protection and enhancement of native habitats similarly for both the Modified Proposed Action Option and the Proposed Action.

No new impacts or significantly more adverse impacts are anticipated from the Modified Proposed Action Option (Table 9). For the impact issues of habitat removal and alteration and direct mortality, the Modified Proposed Action Option would result in slightly less impacts than the Proposed Action due to a decrease in the total area of temporary and permanent ground disturbance and decrease in the number of turbines.

Table 9. Evaluation of Modified Proposed Action Option Impacts to Wildlife

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Habitat removal and alteration	Minor adverse/ Moderate Beneficial	Minor adverse/ Moderate Beneficial	The Modified Proposed Action Option would require less vegetation removal due to the reduction of the total area of temporary and permanent ground disturbance (see Section 2.7).
Direct mortality	Minor	Minor	The Modified Proposed Action Option would have one less turbine which may slightly reduce collision risk associated with Project operation.
Noise and disturbance	Minor	Minor	No change in impact. The Modified Proposed Action Option would result in a slight decrease in noise and disturbance related to construction but this decrease would be negligible.

2.9 Threatened and Endangered Species

Construction and operation of the Project would result in direct and indirect effects to threatened and endangered species under both the Proposed Action and the Modified Proposed Action Option. There are eight State and Federally threatened and endangered species that are known to occur, or have the potential to occur, in the vicinity of the wind farm site (see Table 10 for a list of the eight species and see Section 3.9 of DEIS for a description of each species).

The Final HCP includes incidental take calculations based on the Modified Proposed Action Option, incorporating 9 turbines with larger dimensions. However, Project take estimates under the Proposed Action (i.e., included in the Draft HCP and evaluated in the Draft EIS) and Modified Proposed Action Option are comparable (the same or less than presented in the Draft HCP) and do not result in different levels of requested take for any of the Covered Species. Additionally, the Modified Proposed Action Option does not result in changes to the HCP avoidance, minimization, and mitigation measures. Therefore, no new impacts or significantly more adverse impacts would occur under the Modified Proposed Action Option compared to the Proposed Action (Table 10).

Table 10. Evaluation of Modified Proposed Action Option Impacts to Threatened and Endangered Species

Species	Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
		Proposed Action	Modified Proposed Action Option	
Hawaiian hoary bat	Incidental Take	Negligible	Negligible	The Modified Proposed Action Option considers the operation of up to 9 turbines; thereby reducing risk of take by one turbine. However, requested authorized take levels under the HCP would be the same for the Proposed Action and Modified Proposed Action Option.
	Habitat Impacts	Negligible	Negligible	
Newell's shearwater	Incidental Take	Negligible	Negligible	
	Habitat Impacts	No Impact	No Impact	
Hawaiian goose	Incidental Take	Negligible	Negligible	
	Habitat Impacts	Negligible	Negligible	
Hawaiian duck	Incidental Take	Negligible	Negligible	
	Habitat Impacts	No Impact	No Impact	
Hawaiian stilt	Incidental Take	Negligible	Negligible	
	Habitat Impacts	No Impact	No Impact	
Hawaiian coot	Incidental Take	Negligible	Negligible	
	Habitat Impacts	No Impact	No Impact	
Hawaiian moorhen	Incidental Take	Negligible	Negligible	
	Habitat Impacts	No Impact	No Impact	
Hawaiian short-eared owl	Incidental Take	Negligible	Negligible	
	Habitat Impacts	No Impact	No Impact	

2.10 Socioeconomics

Direct or indirect effects on socioeconomic resources from the Modified Proposed Action Option would be the same as the Proposed Action. There are no data providing a clear link between turbine number and dimensions and socioeconomic factors such as property values, population, housing demand, and other factors. No new impacts or significantly more adverse impacts to socioeconomic resources are anticipated from the Modified Proposed Action Option. See Table 11 for an evaluation of each socioeconomic impact issue identified in the DEIS.

Table 11. Evaluation of Modified Proposed Action Option Impacts to Socioeconomic Resources

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Property values	Variable	Variable	No change in impact. Property value impacts will be similar under both the Modified Proposed Action Option and the Proposed Action.
Homeowner's insurance rates	Negligible	Negligible	No change in impact. No impact to homeowner insurance rates are anticipated under either the Modified Proposed Action Option or the Proposed Action.
Businesses	Minor	Minor	No change in impact. Project impacts on nearby recreation and tourism businesses would be negligible to minor under either the Modified Proposed Action Option or the Proposed Action.
Residential solar energy/ photovoltaic system installation	Negligible	Negligible	No change in impact. Hawaii Electric Company's limits on rooftop solar installations are not related to existing or planned wind projects.
Population	Minor	Minor	No change in impact. No change is anticipated in the assumed temporary and permanent population gain as described under the Proposed Action in the DEIS.
Demand on housing	Minor	Minor	No change in impact. No change is anticipated in the number of construction or operation workers needed or in the assumption of temporary housing needs described under the Proposed Action in the DEIS.
Employment/income	Minor	Minor	No change in impact. No change is anticipated in the number of construction or operation workers needed as described under the Proposed Action in the DEIS.

2.11 Historic, Archaeological, and Cultural Resources

Direct effects on historic, archaeological, and cultural resources from the Modified Proposed Action Option would be similar to the direct effects from the Proposed Action. Indirect effects from the construction and operation of the Project would be the same under both the Proposed Action and the Modified Proposed Action Option. Indirect impacts to historic, archaeological and cultural resources could result from noise, dust, and vibrations caused by earthmoving and heavy equipment, or from the loss of community access to cultural resources, such as traditional cultural properties. No new impacts or significantly more adverse impacts are anticipated from the Modified Proposed Action Option (Table 12).

Table 12. Evaluation of Modified Proposed Action Option Impacts to Historic, Archaeological, and Cultural Resources

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Archaeological sites	Minor	Minor	No change in impacts to archaeological sites are anticipated under the Modified Proposed Action Option. Two archaeological sites identified in the Archaeological Inventory Survey (AIS) are located in proximity to the turbine and access road that would not be included in the Modified Proposed Action Option (archaeological sites 7846 and 7844). These sites are recommended for preservation in the Project AIS; however, both sites are outside of the area of disturbance and would not be affected by Project construction under both the Modified Proposed Action and the Proposed Action.
Traditional cultural uses and practices	Negligible	Negligible	No change in impact. No effects to traditional cultural uses and practices would occur under either the Modified Proposed Action Option or the Proposed Action.

2.12 Land Use

Direct effects on land use from the construction of the Modified Proposed Action Option would be less than the Proposed Action due to the decrease in Project footprint and acres of disturbance to agricultural uses. Indirect effects on land use related to air quality, noise, visual, public health, and traffic considerations would be the same for the Modified Proposed Action Option as they are for the Proposed Action.

No new impacts or significantly more adverse impacts to land use are anticipated from the Modified Proposed Action Option. See Table 13 for an evaluation of each land use impact issue identified in the DEIS.

Table 13. Evaluation of Modified Proposed Action Option Impacts to Land Use

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Compatibility with existing and planned land uses	Minor	Minor	No change in impacts. Both the Modified Proposed Action Option and the Proposed Action would be compatible with existing and planned land use, and consistent with land use plans and policies (see Chapter 5 of the EIS for additional discussion).
Consistency with the Koolau Loa Sustainable Communities Plan and land use regulations	Consistent/No Impact	Consistent/No Impact	No change in impact.

2.13 Agriculture

Direct effects on agriculture from the construction and operation of the Project under the Modified Proposed Action Option would be less than the Proposed Action due to the decrease in the Project footprint and resulting acres of disturbance to agricultural uses. Under the Modified Proposed Action Option, approximately 2.7 acres (1.8 hectares) of actively farmed land (row crops) would be permanently affected. Under the Proposed Action approximately 4.6 acres (1.8 hectares) of actively farmed land would be permanently affected. Under both the Modified Proposed Action Option and the Proposed Action no net loss of active agriculture would occur because NPMPP would work with farmers to prepare existing non-arable land for agricultural production (e.g., grubbing, grading, soil amendments, extend irrigation, etc.). Therefore, no new impacts or significantly more adverse impacts to agriculture are anticipated from the Modified Proposed Action Option (Table 14).

Table 14. Evaluation of Modified Proposed Action Option Impacts to Agriculture

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Impacts to active agriculture	Minor	Minor	The Modified Proposed Action Option would have reduced impacts to active agriculture compared to the Proposed Action due to a smaller Project footprint.
Impacts to irrigation/water availability or road access for farmers	Minor	Minor	The Modified Proposed Action Option and the Proposed Action would result in temporary disruptions in access to farm plots and/or to irrigation water during construction.

2.14 Recreation and Tourism

Similar to the Proposed Action, the Modified Proposed Action Option would not result in a direct loss of opportunity to any recreation or tourism resource in the analysis area. The Modified Proposed Action would have negligible to minor impacts on recreation and tourism due to

construction traffic and noise and will have comparable overall visual impacts as the Proposed Action.

No new impacts or significantly more adverse impacts to recreation and tourism are anticipated from the Modified Proposed Action Option. Table 15 evaluates each recreation and tourism impact issue identified in the DEIS.

Table 15. Evaluation of Modified Proposed Action Option Impacts to Recreation and Tourism

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Direct loss of recreation or tourism opportunity	No Impact	No Impact	No change in impact.
Indirect loss of recreation or tourism opportunity due to traffic, noise, or visual impacts	Negligible	Negligible	No change in impact.
Predicted impacts to recreation and tourism use rates	Negligible	Negligible	No change in impact.

2.15 Visual Resources

Direct and indirect effects on visual resources from the Modified Proposed Action Option would be essentially the same as those for the Proposed Action using the same methodology and standards of evaluating impacts on visual resources (see Section 4.16 – Visual Resources). Table 16 summarizes the potential visual impact of the Project for each viewpoint under the Modified Proposed Action Option. At each viewpoint, the visual impact intensity is similar to the Proposed Action and ratings are the same determined for the Proposed Action (see Table 4.16-3 of the EIS).

Visual simulations of the Modified Proposed Action Option and the Proposed Action are shown in Figures 2 through 6 at the four viewpoints that was included in the DEIS. At locations from which the Project would be visible, the view with the Modified Proposed Action Option would typically include one less turbine than would have been visible with the Proposed Action. This aspect of the Modified Proposed Action Option would result in a slight reduction in the incremental visual change created by the Project. Because the Modified Proposed Action Option would employ taller turbines, however, each turbine would create slightly more visual contrast than an individual turbine under the Proposed Action. Reevaluation of the with-Project conditions for each viewpoint under the Modified Proposed Action Option indicated that the difference in visual contrast would not be sufficient to change the contrast rating or the change in visual quality rating for any of the viewpoints.

Table 17 summarizes the updated results of the viewpoint-specific impact evaluation and the overall evaluation of the change to visual resource character, which was the fundamental impact

Table 16. Modified Proposed Action Option: Visual Impact Intensity for Viewpoints

Viewpoint	Viewpoint Name	Closest Wind Turbine to Project (miles)	Viewer Group(s) Represented	Existing Scenic Quality	Contrast Rating	Change in Visual Quality	Overall Viewer Response	Impact Intensity
01	Laie Hawaii Temple	1.7	Recreational, Institutional	High	None	None	Moderate	None
02	Polynesian Cultural Center	2.5	Recreational	Medium	None	None	Moderate	None
03	The Church of Jesus Christ of Latter Day Saints	5.0	Institutional	High	None	None	Moderate	None
04	Kahuku Community	0.5	Residential	Low	Weak	Low	High	Moderate
05	Kahuku Sugar Mill Site	0.5	Commercial	Low	Weak	Low	Low-Moderate	Low
06*	Kahuku Community Center	0.5	Recreational	Moderate	Moderate	Moderate	Moderate	Moderate
07	Malaekahana State Recreation Area	1.0	Recreational	Moderate	Moderate	Moderate	Moderate	Moderate
08	Kamehameha Highway	0.6	Highway travelers	Low	Moderate	Low	Moderate	Low-Moderate
09	Kahuku High and Intermediate School	0.5	Institutional	Low	Weak	Low	Moderate	Low-Moderate
10	Turtle Bay Resort	2.5	Recreational	Moderate	Weak	Low	Moderate	Low-Moderate
11	Punaluu Beach Park	7.3	Recreational	High	None	None	Moderate	None
12	Kahama Valley State Park Beach	9.0	Recreational	High	None	None	Moderate	None
13*	James Campbell National Wildlife Refuge	1.0	Recreational	Moderate	Moderate	Moderate	Moderate	Moderate
14	North Windward Baptist Church	5.0	Institutional	Moderate	None	None	Moderate	None
15	Laie Point Coastal Residences	2.5	Residential	High	Moderate	Moderate-High	Moderate-High	Moderate-High
16	Swanzy Beach Park	9.6	Recreational	High	None	None	Moderate	None

Table 16. Modified Proposed Action Option: Visual Impact Intensity for Viewpoints (continued)

Viewpoint	Viewpoint Name	Distance from Project (miles)	Viewer Group(s) Represented	Existing Scenic Quality	Contrast Rating	Change in Visual Quality	Overall Viewer Response	Impact Intensity
17	Kahuku Hospital and Medical Center	0.5	Institutional	Low	Weak	Low	Moderate	Low-Moderate
18	Kahuku Elementary School	0.3	Institutional	Low	Weak	Low	Moderate	Low-Moderate
19*	Kahuku Golf Course	1.0	Recreational	Moderate	Moderate	Moderate	Moderate	Moderate
20*, **	Malaekahana Bike and Pedestrian Path	1.0	Recreational	Moderate	Moderate	Moderate	Moderate	Moderate
21	Kamehameha Highway	1.6	Highway Travelers	Low	Moderate	Low	Moderate	Low-Moderate

Key:
* - A visual simulation has been completed for the viewpoint.
** - A nighttime visual simulation has been complete for viewpoint

Table 17. Evaluation of Modified Proposed Action Option Impacts to Visual Resources

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Number of viewpoints with no visual impact	7	7	Number of viewpoints with no visibility same for Proposed Action and Modified Proposed Action Option.
Number of viewpoints with low or low-moderate visual impact intensity	7	7	No change in impact.
Number of viewpoints with moderate or moderate-high visual impact intensity	7	7	No change in impact.
Number of viewpoints with high visual impact intensity	0	0	No change in impact.
Changes to visual resource character	Moderate	Moderate	No new or substantially more adverse visual impacts with Modified Proposed Action Option.

issue identified in the DEIS under this resource. The summary of visual impact under the Modified Proposed Action Option would be the same as reported in the DEIS for the Proposed Action: visual impact intensity would be moderate or less for all of the viewpoints; the extent of the most noticeable visual impacts would be local; the Project would primarily affect common visual resources that are not rare, unique, or protected by specific legislation; and the overall visual impacts of the Project would be moderate. Therefore, the Modified Proposed Action Option would not result in a significant new impact or a significantly more adverse impact than the Proposed Action.

2.16 Transportation

Direct and indirect effects on transportation infrastructures from the Modified Proposed Action Option would be the comparable to the Proposed Action. There would be no change in the transportation route for construction. The Proposed Action and Modified Proposed Action Option would result in the same number average number of truck trips per day (144 truck trips) and maximum number of truck trips per day (154 truck trips). Therefore, no new impacts or significantly more adverse impacts to transportation would occur under the Modified Proposed Action Option. Table 18 evaluates each impact issue identified in the DEIS under this resource.

Table 18. Evaluation of Modified Proposed Action Option Impacts to Transportation

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Increase traffic exceeding a 100 new peak hour trips or 500 daily trips on Kamehameha Highway	Negligible	Negligible	No change in impact. Neither the Proposed Action nor Modified Proposed Action Option would trigger then need for a Traffic Impact Report by HDOT.
Long term traffic delays for a substantial number of motorist	Minor	Minor	No change in impact. Under both the Proposed Action and Modified Proposed Action Option, 90 percent of construction truck trips would occur outside of peak traffic times, and would comprise less than 3 percent of the base traffic levels along Kamehameha Highway.
Changes to traffic patterns that create hazardous situations for motorist, pedestrians, or bicyclists	Minor	Minor	No change in impact.
Changes to air or marine traffic patterns that would cause substantial safety hazards	Negligible	Negligible	No change in impact.
Increase traffic to affect traffic patterns to and from the mitigation areas	Negligible	Negligible	No change in impact.

2.17 Public Health

Impacts associated with construction and operation of the Project under the Modified Proposed Action Option related to public health and safety would be the same as under the Proposed Action with respect to turbine collapse and blade throw, fire risk and hazardous materials exposure, EMF, and stray voltage.

There is no state or national standard that exist for frequency or duration of shadow flicker from wind turbines. However, a threshold of 30 hours per year has been widely used in the industry as a target value in the absence of formal guidelines. However, predicted shadow flicker greater than this threshold does not necessarily create a nuisance and is still well below concerns for impacts to health such as triggering epileptic seizures.

Shadow flicker impacts would be slightly greater under the Modified Proposed Action Option at some sensitive receptors due to the larger size of the turbines. Twenty-five of the 737 receptors modeled in the shadow flicker analysis showed impacts of more than 30 hours per year under the Modified Proposed Action; whereas 17 receptors showed shadow flicker impacts of more than 30

hours per year under the Proposed Action. The maximum predicted shadow flicker impact at any receptor under the Modified Proposed Action is 258 hours 19 minutes per year versus a maximum predicted shadow flicker impact of 244 hours 9 minutes per year under the Proposed Action. This receptor is a farm structure located within the wind farm site used for storing and processing truck crops from the surrounding agricultural fields. Although the number of shadow flicker hours would increase for some receptors (see Appendix K of the EIS), there would be no change in risk to public health and safety.

Under both the Proposed Action and Modified Proposed Action, the potential for shadow flicker would be almost entirely contained within the wind farm site, and the amount of potential flicker extending onto adjacent areas would be relatively short in duration. No shadow flicker impacts would occur at the Kahuku High School, Kahuku Elementary School, or Kahuku Medical Center under either the Modified Proposed Action Option or the Proposed Action. To mitigate for shadow flicker impacts, NPMPP will offer home owners for which shadow flicker is predicted to be greater than 30 hours per year reimbursement for costs up to $800 for adding awnings or blinds to windows facing the wind farm and/or landscaping/trees to block shadow flicker.

Table 19 evaluates each impact issue identified in the DEIS under this resource. No new impacts or significantly more adverse impacts to public health and safety are anticipated from the Modified Proposed Action Option.

Table 19. Evaluation of Modified Proposed Action Option Impacts to Public Health

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Turbine collapse and blade throw	Negligible	Negligible	No change in impact. Under both the Modified Proposed Action Option and the Proposed Action there is a negligible risk of impacts to public health and safety in association with turbine collapse and blade throw.
Shadow flicker	Moderate	Moderate	No change in significance of impact; shadow flicker at individual receptors would increase under the Modified Proposed Action Option but there would be no change in effects to public health and safety.
Fire and fuels	Minor	Minor	No change in impact. The reduction of one turbine to the Project layout under the Modified Proposed Action Option will only slightly reduce the risk of fire; therefore the impact is the same as the Proposed Action.
Noise and vibration	Minor/negligible	Minor/negligible	Due to the reduced number of turbines under the Modified Proposed Action Option, there is a reduced risk of impacts to public health and safety in association with noise. No impacts would occur in association with vibration.

Table 19. Evaluation of Modified Proposed Action Option Impacts to Public Health (continued)

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Electromagnetic fields (EMF)	Negligible	Negligible	No change in impact. Public or farm worker exposure to EMF is negligible under both the Modified Proposed Action Option and the Proposed Action due to low frequency of the magnetic field.
Stray voltage	Negligible	Negligible	No change in impact. Due to the implementation of standard industry procedures, negligible effects to public health and safety from stray voltage are expected in association with the both the Modified Proposed Action Option and the Proposed Action.

2.18 Environmental Justice

The communities of Kahuku, Laie, and the coastal area south to Kaneohe Bay may be considered minority environmental justice populations based on the disproportionate concentration of Native Hawaiians and Other Pacific Islanders relative to Oahu as a whole (Oahu Metropolitan Planning Organization and Department of Planning and Permitting 2004, U.S. Census Bureau 2012). Neither the Modified Proposed Action Option nor the Proposed Action would result in high and adverse human health or environmental impact; and therefore, neither action alternative would have the potential to disproportionately impact these minority communities, especially Kahuku.

Table 20 provides an evaluation of each environmental justice impact issue identified in the DEIS. No new impacts or significantly more adverse impacts to the environmental justice community are anticipated from the Modified Proposed Action Option.

Table 20. Evaluation of Modified Proposed Action Option Impacts to Environmental Justice

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Effects to environmental justice community	Negligible	Negligible	No change in impact.

2.19 Public Infrastructure

Potential effects on public infrastructure facilities and services, including electric service, gas service, water supply, wastewater management, stormwater management, education facilities, emergency and health services, solid waste management, and telecommunications would be the same under the Modified Proposed Action Option as they would be under the Proposed Action. Table 21 provides an evaluation of each public infrastructure impact issue identified in the DEIS. No

new impacts or significantly more adverse impacts to public infrastructure are anticipated from the Modified Proposed Action Option.

Table 21. Evaluation of Modified Proposed Action Option Impacts to Public Infrastructure

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Electric service	Minor adverse/moderate beneficial	Minor adverse/moderate beneficial	No change in impact. The electricity service required during construction and operation will be the same under both the Modified Proposed Action Option and the Proposed Action.
Gas service	Negligible	Negligible	No change in impact. Traffic management plan prepared under both the Modified Proposed Action Option and the Proposed Action will mitigate any potential for disruption to bottled gas delivery.
Water supply	Negligible	Negligible	No change in impact. Avoidance and minimization measures described under the Proposed Action will be implemented under the Modified Proposed Action Option to avoid any impacts to existing water wells or public water system infrastructure in the vicinity of the Project.
Wastewater management	Minor	Minor	No change in impact. Wastewater generation will be the same (minimal) under the Modified Proposed Action Option as it would be under the Proposed Action.
Stormwater management	Minor	Minor	No change in impact. Construction of the Project would not impact existing stormwater drainage infrastructure, as there is none in the wind farm site that could be affected
Solid waste management	Minor	Minor	No change in impact. The amount of waste generated under the Modified Proposed Action Option would be similar to the Proposed Action and is not expected to adversely impact existing waste management services or facility capacity.

Table 21. Evaluation of Modified Proposed Action Option Impacts to Public Infrastructure (continued)

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Education facilities and emergency and health services	Minor	Minor	No change in impact. Direct and indirect impacts to nearby educational facilities and emergency and health services will be the same under both the Modified Proposed Action Option and the Proposed Action.
Telecommunications	Minor	Minor	No change in impact. Minor impacts to telecommunications described under the Proposed Action would be the same for the Modified Proposed Action Option.

2.20 Military Interests

Direct and indirect effects on military interests from the Modified Proposed Action Option would be the same as the Proposed Action. Table 22 provides an evaluation of each military interest impact issue identified in the DEIS. No new impacts or significantly more adverse impacts to military interests are anticipated from the Modified Proposed Action Option.

Table 22. Evaluation of Modified Proposed Action Option Impacts to Military Interests

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Loss of land area available to the military for training	Negligible	Negligible	No change in impact. Construction and operation of the Project under both the Modified Proposed Action Option and the Proposed Action would not occupy any land currently used by the military, and would not reduce the area of land available for training.
Change in training practices or activities with a resulting change in military readiness	Negligible	Negligible	No change in impact. Negligible impacts to military helicopter flights and other military air traffic described under the Proposed Action would be the same for the Modified Proposed Action Option.

Table 22. Evaluation of Modified Proposed Action Option Impacts to Military Interests (continued)

Impact Issues	Summary of Impact		Evaluation of whether Modified Proposed Action Option Impacts are New or More Adverse from Proposed Action
	Proposed Action	Modified Proposed Action Option	
Degradation of function of military communication systems	Negligible	Negligible	No change in impact. Negligible impacts to military communication systems described under the Proposed Action would be the same for the Modified Proposed Action Option.
Hazard to training flight operations in the A-311 TFTA[1/]	Negligible	Negligible	No change in impact. Under both the Modified Proposed Action Option and the Proposed Action, approximately 198.1 acres (80.2 hectares) of the wind farm site lies within the TFTA, representing approximately 0.32 percent of the flight training area. All turbines under the Propose Action would be below assumed approach/departure clearance planes helicopter landing zones in the Kahuku Training Area; one turbine under the Modified Proposed Action would coincide with the clearance planes of two landing zones. However, because the FAA allows heliport approach/departure paths to be curved, allowing them to avoid pre-existing or new obstructions, this turbine would not represent an obstruction for designated helicopter landing zones.

1/ The Army's A-311 Alert Area overlays the Kahuku Training Area and Kawailoa Training Area (see Figure 3.19-1 in EIS); it is commonly referred to as the Tactical Flight Training Area (TFTA).

3.0 CONCLUSION

Based on the above analysis, the Modified Proposed Action Option would not result in any new impacts or significantly more adverse impacts than the Proposed Action and already disclosed in the DEIS. Therefore, the Final EIS will carry forward the proposed modifications to the Project as described in Section 2 as the Modified Proposed Action Option evaluated as Alterative 2a.

Figures

Figure 1

Na Pua Makani Wind Project

Visual Simulation
Kahuku Community Center

January 2016 **Oahu, HI**

Looking southwest from the Kahuku Community Center

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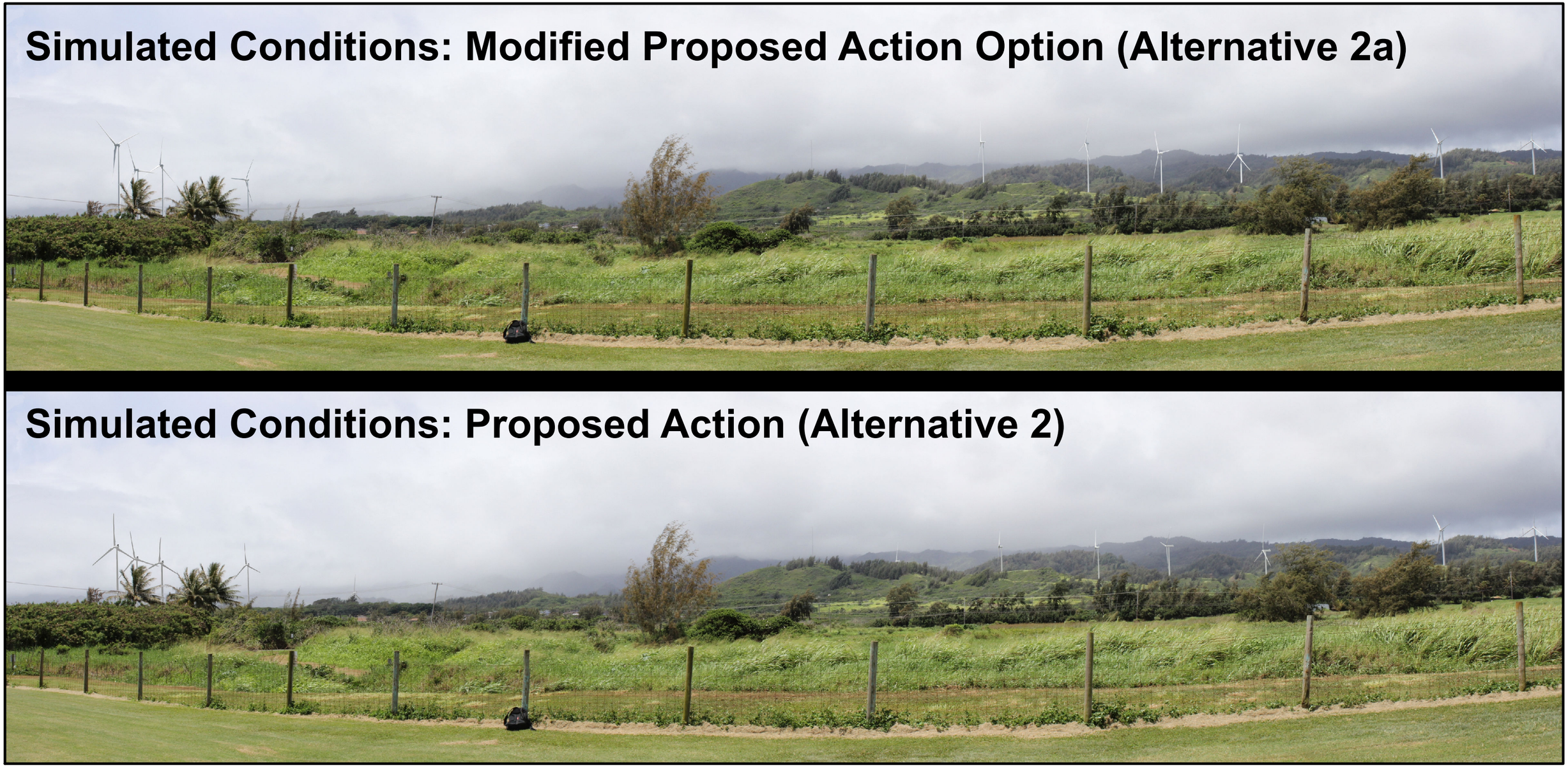

Figure 2

Na Pua Makani Wind Project

Visual Simulation
James Campbell National Wildlife Refuge

January 2016 **Oahu, HI**

Looking southwest from the James Campbell National Wildlife Refuge

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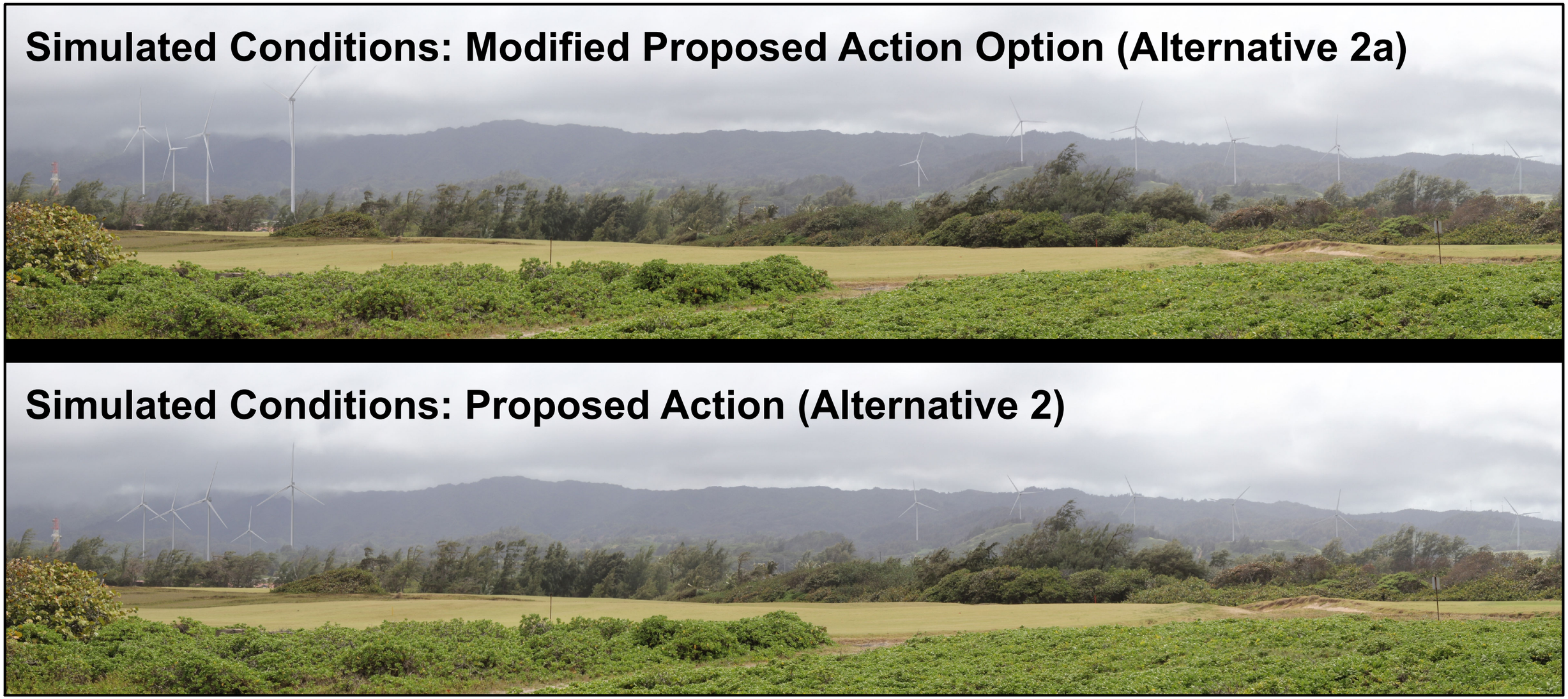

Figure 3

Na Pua Makani Wind Project

Visual Simulation
Kahuku Golf Course

January 2016 **Oahu, HI**

Looking southwest from the eastern edge of the Kahuku Golf Course

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Figure 4

Na Pua Makani Wind Project

Visual Simulation
Kahuku Walking Trail

January 2016 **Oahu, HI**

Looking northwest from the walking path on the west side of Kamehameha highway, approximately 1/2 mile south of Kahuku

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Figure 5

Na Pua Makani Wind Project

Night Time Visual Simulation
Kahuku Walking Trail

January 2016 **Oahu, HI**

Looking northwest from the walking path on the west side of Kamehameha highway, approximately 1/2 mile south of Kahuku

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