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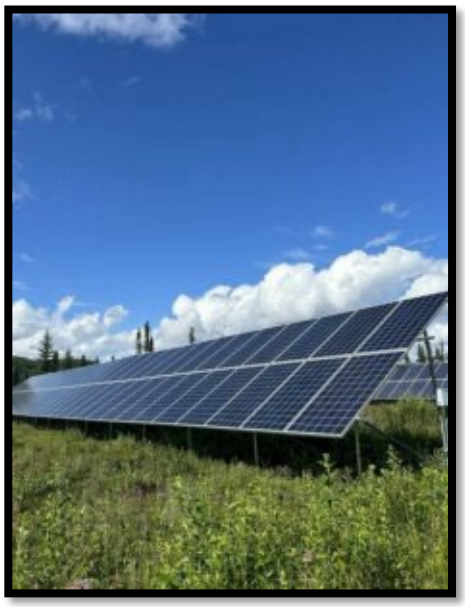
DOE/EA-2284

FINAL Environmental Assessment

Tanana Chiefs Conference
Alaska Tribal Energy Sovereignty, Minto and Grayling, Alaska



Solar panels in Hughes, Alaska
(source: https://www.tananachiefs.org/updates-from-tcc-infrastructure/)

Hughes, Alaska Community Members in front of their solar array
(source: https://www.energy.gov/oced/energy-improvements-rural-or-remote-areas-selected-and-awarded-projects)

U.S. Department of Energy
Office of Clean Energy Demonstrations
1000 Independence Ave SW
Washington, D.C. 20585

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ACRONYMS AND ABBREVIATIONS

ADF&G	Alaska Department of Fish and Game
APE	Area of Potential Effects
AVEC	Alaska Village Electric Cooperative
BESS	Battery Energy Storage System
CFR	Code of Federal Regulations
dB	Decibel
dBA	Decibel (A-weighted)
DOE	United States Department of Energy
EA	Environmental Assessment
EO	Executive Order
FEMA	Federal Emergency Management Agency
GHG	Greenhouse Gases
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
OCED	Office of Clean Energy Demonstration
OSHA	Occupational Safety and Health Administration
O&M	Operation and Maintenance
PPV	Peak Particle Velocity
PV	Photovoltaic
STP	Shovel Test Pit
SWPPP	Storm Water Pollution Prevention Plan
U.S.	United States
USFWS	United States Fish and Wildlife Service

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SECTION 1 INTRODUCTION

1.1. Background

The United States Department of Energy competitively selected the Tanana Chiefs Conference (TCC) Alaska Tribal Energy Sovereignty Project for a DOE financial assistance award under the Office of Clean Energy Demonstrations' "Energy Improvements in Rural or Remote Areas Program" fiscal year 2024 funding opportunity, DE-FOA-0002970. The Project and award would assist with deploying high-penetration solar Photovoltaic (PV) and battery energy storage systems (BESS) into existing microgrids in up to eight remote tribal communities (Anvik, Grayling, Huslia, Holy Cross, Kaltag, Minto, Shageluk, and Nulato) currently relying on diesel for 100 percent of their electrical production. This project would reduce the diesel generation of the electric utilities across these communities by 35%, reduce Greenhouse Gas and other noxious emissions dramatically, improve resilience by reducing blackouts and dependence on imported diesel and provide direct financial and health benefits to Alaska Native community members.

The Proposed Action would be to construct eight solar photovoltaic (PV) generation systems paired with community scale modular battery systems in eight small isolated tribal microgrids. The battery energy storage systems would be sized to allow for one to two hours of coverage during peak demand to avoid potential blackout conditions, which typically occur in the middle of winter. All eight communities are traditional Alaska Native communities practicing a traditional subsistence lifestyle. All eight communities are not accessible by road, are only seasonally reachable via barge or boat traffic, and are primarily served year-round by small airplanes. All eight communities operate small microgrids with peak demands ranging from 150 kW to 350 kW powered by 100 percent diesel generation. Homes are primarily heated by diesel as well. As a result, the communities are dependent upon importing expensive diesel fuel, resulting in high cost of energy in the communities. The high costs are largely due to the immense expense to transport and store fuel seasonally via barge, which can only occur between "breakup" and "freezeup," i.e., during the short summer season on the Yukon River.

Construction would be completed with 2-4 installations being completed each year; therefore, National Environmental Policy Act (NEPA) reviews for the eight communities will be completed in batches corresponding to their anticipated construction dates. This Environmental Assessment (EA) prepared pursuant to NEPA covers the systems planned for the villages of Minto and Grayling, Alaska (Figure 1).

The DOE is aware that the Council on Environmental Quality (CEQ), on February 25, 2025, issued an interim final rule to remove its NEPA implementing regulations at 40 C.F.R. Parts 1500–1508. Based on CEQ guidance, and to promote completion of its NEPA review in a timely manner and without delay, in this EA, DOE is voluntarily relying on the CEQ regulations, in addition to DOE's own regulations implementing NEPA at 10 C.F.R. Part 1021, to meet its obligations under NEPA, 42 U.S.C. §§ 4321 *et seq*.

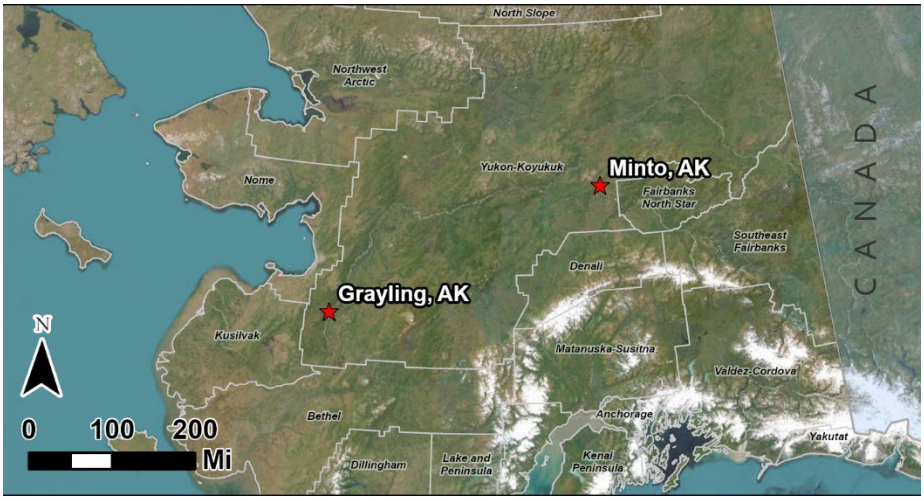

Figure 1: Minto, AK and Grayling, AK (PHE GIS)

1.2. Purpose and Need for Action

The purpose and need for agency action is to comply with the DOE's statutory mandates in the Infrastructure Investment and Jobs Act [1] (IIJA) (Pub. L. 117-58 (Nov. 15, 2021)) to provide Federal financial assistance to rural or remote areas[1] for the purpose of 1) overall cost-effectiveness of energy generation, transmission, or distribution systems; 2) siting or upgrading transmission and distribution lines; 3) reducing greenhouse gas emissions from energy generation by rural or remote areas; 4) providing or modernizing electric generation facilities; 5) developing microgrids; and, 6) increasing energy efficiency. 42 U.S.C. 18712(c).

DOE's purpose is to select ERA projects that:

- Fund community-driven projects that demonstrate clean energy systems,
- Deliver measurable and sustained benefits to people who live in areas with fewer than 10,000 people, and
- Build clean energy knowledge, capacity, and self-reliance throughout rural America.

The need is to respond to TCC's request for financial assistance through the cost-shared partnership to complete the construction and operation of solar PV and BESS projects in the villages of Minto and Grayling, AK, which would modernize and improve reliability of grid infrastructure, offset diesel consumption, lower and stabilize energy costs, and reduce emissions.

1.3. DOE's Proposed Action

DOE's Proposed Action would be to authorize the expenditure of federal funding for TCC to design, construct, and operate high-penetration solar PV arrays and battery energy storage systems as part of the existing microgrids in Minto and Grayling, Alaska. Section 2 of this EA describes the Proposed Action in detail.

1.4. Cooperating Agencies

No cooperating agencies are involved in this effort.

1.5. Scoping, Public Involvement and Issues

This Project aims to improve grid reliability, enhance air quality, and decrease community energy burdens (TCC n.d.1). TCC plans to implement a range of open communication channels to establish collaboration and engagement through social media, a Project website, radio announcements for meetings, and flyers posted on community bulletin boards. Project updates are being posted to the TCC website at https://www.tananachiefs.org/. Information on the Project has also been posted online in the AVEC newsletter at https://avec.org/2024/04/03/april-2024-back-page-spring-into-the-future/.

TCC notified the public about the Project through a website posting on February 29, 2024 (TCC February 29, 2024). A similar posting was made by AVEC on April 3, 2024 (AVEC April 3, 2024). Updates on the Project were then posted by the TCC in September of 2024 (TCC September 24, 2024).

DOE provided the draft EA on April 23, 2025, for a 14-day host tribe review closing on May 7, 2025. DOE did not receive any comments.

SECTION 2 PROPOSED ACTION, NO-ACTION ALTERNATIVE, AND REASONABLY FORESEEABLE ACTIVITIES

2.1. Proposed Action

The Minto, Alaska, solar PV array site (Figure 2) would be located at the north end of Minto on the west side of the existing pathway to the existing sewage lagoon. Construction activity would include clearing one acre of land and site preparation for the PV racking foundation and an equipment pad.

[1] Rural or remote area meaning a city, town, or unincorporated area that has a population of not more than 10,000 inhabitants.

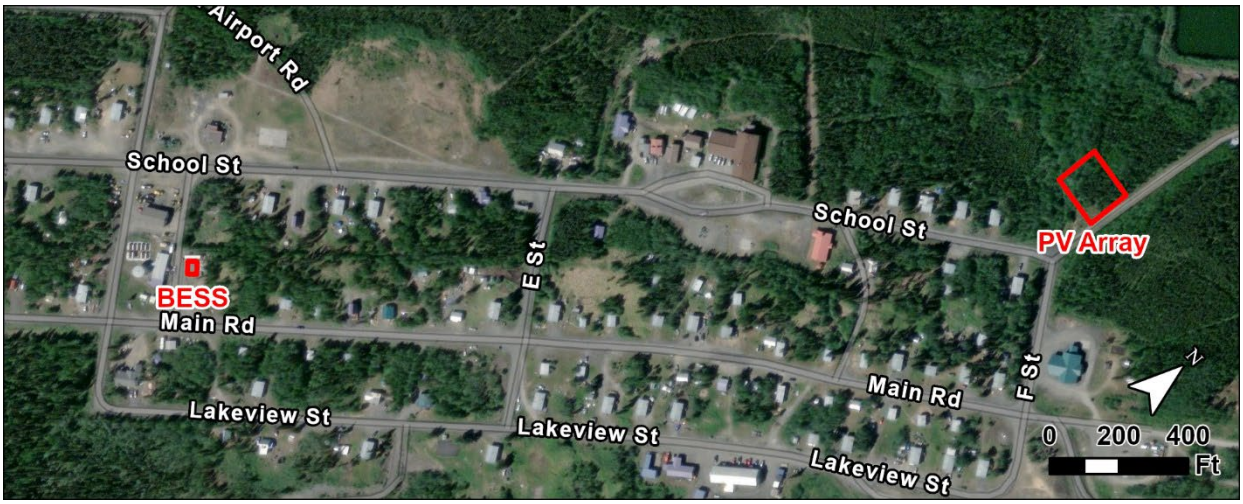

Figure 2: Minto, AK site (PHE GIS)

The PV racking foundation would consist of 10 feet deep metal "helical" piers or piles which are driven into the ground by a pile driving machine requiring no boring, fill, or additional concrete. The piers (piles) would be installed in three rows with approximately 40 feet spacing between the rows with two 3-1/2-inch diameter piles driven for each eight feet span of solar panels. Approximately 200 piles would be driven to support the solar PV array, which would occupy approximately half of the solar PV array site.

A 10-foot by 20-foot concrete pad would also be constructed at the solar PV array site to hold inverters, associated switch gear, and a transformer. Electric conduit from the solar PV modules to the concrete pad (inverter pad) would be buried at a 24-inch depth; this trench would be around 200 feet long. Excavated soil from the trench would be used as backfill. The entire solar PV area would be enclosed with a chain link fence.

A second 10-foot by 20-foot pad to house a prefabricated BESS building would be constructed at the existing AVEC (utility provider) power plant on previously disturbed ground. The BESS building would house solar batteries. A pad mounted transformer would also be installed at the BESS building site. The utility (AVEC) would add two power poles to their existing utility easement for wires connecting the inverter and transformer pad at the solar PV array site to the BESS building.

The Grayling, Alaska solar PV site (Figure 3) would be located in Grayling on the north side of H Street between the 3rd and 4th Streets intersections. The existing sewage lagoon is located to the north of the PV array site. The solar PV array at Grayling would be constructed on piles as described above for the Minto site. The only difference would be that the Grayling site would include two rows of PV panels spaced 40 feet apart. The solar PV area would be enclosed with a chain link fence. A similar inverter, switch gear and transformer 10-foot by 20-foot pad would be constructed at the solar PV array site in Grayling as described for the Minto site and connected with conduit in an approximately 200-foot-long trench. A 10-foot by 20-foot BESS building pad would also be constructed at the Grayling power plant and a prefabricated building installed. One new power pole, within the existing utility easement, is anticipated for the Grayling site for transfer of power from the solar PV array inverter pad to the BESS building.

Figure 3: Grayling, AK site (image provided by TCC)

The Tribal ownership business model would be used for the Proposed Action and would help to complete operation and maintenance (O&M) of the systems. In support of the model, TCC plans to establish a utility board of Tribal leaders from across the region to oversee the newly established independent power producer and ensure long term O&M across these systems.

2.2. Alternatives Carried Forward for Detailed Analysis

The only action alternative carried forward is the Proposed Action as presented in Section 2.1.

2.3. Alternatives Considered but Eliminated for Further Analysis

No other alternatives were considered.

2.4. No-Action Alternative

An evaluation of a No-Action Alternative is required under DOE's NEPA implementing regulations at 10 CFR 1021.321(c). Under the No-Action Alternative, DOE would not authorize expenditure of federal funds for TCC to design, construct, and operate solar arrays in Minto and Grayling, Alaska. Any potential beneficial or adverse effects to the physical, biological, cultural or socioeconomic resources from the Proposed Action would not be realized.

DOE has assumed, for the purposes of comparison in this EA, the Project would not proceed without its assistance. If the Project proceeded without DOE assistance, the potential impacts essentially would be identical to those under the DOE Proposed Action.

2.5. Past, Present and Reasonably Foreseeable Activities

DOE has considered reasonably foreseeable impacts that may result from projects proposed, under construction, recently completed or reasonably anticipated to be implemented. Reasonably foreseeable impacts would occur only to those resources impacted by the Proposed Action. Past actions in both Project areas include the construction of the villages of Minto and Grayling, including associated infrastructure like the sewage lagoons and access road. Due to the remote, only seasonally accessible nature of the sites, and the fact that they are both fully located within Tribal lands, no future development or activities are anticipated. The only known present action is the Proposed Action.

2.6. Permitting and Authorization Summary

TCC submitted applications for Department of Army (DA) Permits for both sites. The applications state that no surface waters or floodplains would be impacted. The Proposed Action would convert up to 0.5 acres of wetlands to construct a photovoltaic array in the Villages of Grayling and Minto (up to 1 acre total).

On January 14th and 23rd, 2025, TCC received notification from DA that the work to be performed in the villages of Minto and Grayling would be authorized by Nationwide Permit No. 51, Land-Based Renewable Energy Generation Facilities. This permit addresses discharges of dredged or fill material into non-tidal waters of the United States for

the construction, expansion, or modification of land-based renewable energy production facilities, including attendant features. DA authorization is necessary because the Proposed Action would involve work in and/or placement of fill material into waters of the U.S.

A storm water pollution prevention plan (SWPPP) would be used for sediment and erosion control and mitigate storm water pollutants discharged from the cleared flat PV site in both locations. The Minto site was selected for proximity to the power plant as well as being above the floodplain, outside of mapped wetlands, and over 600 feet from Minto Flats water body. The Grayling site was selected for proximity to the power plant as well as being above the floodplain, outside of mapped wetlands, and over 1,300 feet from the Yukon River. No fill would be added, and the 24-inch distribution line trenching would be backfilled with the excavated soil. Vegetative cover would be allowed to grow back after the solar PV sites are constructed to reduce soil erosion. The 10-foot by 20-foot BESS buildings would be located at the existing AVEC (utility) power plants on previously disturbed ground above the floodplain.

No other permits are anticipated.

2.7. Applicant Committed Measures

This section summarizes the commitments made by TCC to mitigate potential impacts that were identified during the development, permitting, and consultation processes for the Proposed Action.

These commitments would be incorporated and binding through the DOE financial assistance award. For purposes of this EA, the term mitigation measure is broadly defined. The measures summarized below were not necessarily included to decrease the level of impact below significant (i.e., the impacts may have been less than significant with or without the measures), but the measures would be required as a condition of the DOE financial assistance award to further reduce the likelihood of impacts and to ensure the Project is carried out in an environmentally responsible manner.

TCC's submitted Proposed Mitigation Statements for both sites. The following were included:

- An existing road would be used for construction access. No new roads would be constructed.
- Any soil excavated for trenching would be reused for backfill in the trench once conduit is placed.
- A SWPPP would be implemented during construction at each site.

In addition, the following measures are identified in this EA:

- A visual inspection of the proposed solar PV array sites would be conducted prior to construction to determine whether any nesting owls or eagles may be present. If active Great Gray Owl (*Strix nebulosa*), Bald Eagle (*Haliaeetus leucocephalus*), or Golden Eagle (*Aquila chrysaetos*) nests are present, monitoring of the birds' activities should be conducted and tree clearing should be on-hold until it is determined that identified nests are inactive.
- TCC would notify nearby residents and the Minto Community Hall prior to construction activities, particularly commencement of pile driving, limit such activities to daytime hours to the extent possible, and coordinate pile driving activities at the proposed Minto solar PV array site with the Minto Community Hall so meetings and events can be scheduled around times when the loudest construction activities (pile driving) would occur.
- TCC would complete an inspection of construction activities to ensure proper installation of the proposed systems to reduce fire risks.
- Construction personnel would be provided with and required to wear hearing protection.
- TCC would ensure construction equipment is fitted with properly functioning emission and noise control systems.
- TCC would not permit construction equipment to idle, to the extent possible.

- TCC would prepare a proper O&M plan, that includes vegetative maintenance, especially during warm, dry weather conditions, to further reduce the risk for fires.
- TCC would ensure disposal of solar panels in accordance with DOE's Photovoltaic End-of-Life Plan (SETO 2022).

SECTION 3 AFFECTED ENVIRONMENT AND IMPACTS ANALYSIS

3.1. Background

This section discusses the existing conditions of the physical, biological, cultural, and human environment (affected environment) that could be affected by the alternatives described in Section 2. Following the description of the affected environment, potential direct, indirect, and reasonably foreseeable activity impacts from each alternative are analyzed.

The identification and description of activities that have the potential to create impacts on natural and human resources in areas proposed for use by the Proposed Action have been divided into two phases: (1) construction and (2) O&M phase of the solar arrays, BESS building, and associated power plant updates. The activities occurring during each phase were used, as appropriate, to evaluate resource specific impacts. It is important to note that these activities were considered within the larger context of other sources of the same or similar impact-producing actions that have occurred in the recent past, do currently occur, or could be reasonably expected to occur in the near future, within the site of the Proposed Action.

The following terms were used to characterize adverse impacts from the Proposed Action:

(1) Negligible:
- Impacts would be at the lowest levels of detection, barely or not measurable, with no perceptible consequences.

(2) Minor:
- Impacts would result in a detectable change, but the change would be slight or could be avoided with proper mitigation, or
- Impacts would not disrupt normal or routine functions of the affected resource, or
- Once the impacting agent is eliminated (i.e., construction activity), the affected resource would return to a condition with no measurable effects from the Proposed Action without requirement for any mitigation.

(3) Moderate:
- Unavoidable impacts would result in a detectable change with measurable effects and proper mitigation would reduce impact substantially during the life of the Proposed Action, or
- The affected resource would have to adjust somewhat to account for disruptions due to impacts of the Proposed Action, or
- Once the impacting agent is eliminated, the affected resource would return to a condition with no measurable effects from the Proposed Action if proper remedial action is taken.

(4) Major:
- Impacts would be unavoidable with substantial consequences, or
- Proper mitigation would reduce impacts somewhat during the life of the Proposed Action, or
- The affected resource would experience unavoidable disruptions to a degree beyond what is normally acceptable, and once the impacting agent is eliminated, the affected activity or community may retain measurable effects of the Proposed Action indefinitely, even if remedial action is taken.

3.2. Identification of Resources and Affects

Indigenous Knowledge also known as Traditional Ecological Knowledge or Native Science refers to the evolving knowledge acquired by indigenous and local peoples over hundreds or thousands of years through direct contact with the environment. This knowledge is specific to a location and includes the relationships between plants, animals, natural phenomena, landscapes, and timing of events that are used for lifeways, including but not limited to hunting,

fishing, trapping, agriculture, and forestry. TCC used their knowledge of the Project areas to select a site for the proposed solar PV arrays and associated infrastructure in locations that would avoid adverse impacts to the extent practicable to the natural, cultural, and social environments of the Project areas.

For those resources that are present and potentially affected, the table includes information on effects that are readily determined as negligible or minor. For resources that require more discussion to determine the significance of the impact, additional discussion is provided in Section 3.3.

Table 1: Minto, AK site Resources Not Present; Present, not Affected; and Present, Potentially Affected

Impact Topic	Not Present	Present		Rationale
		Not Affected	Potentially Affected	
Geology / Seismic			X	The proposed solar PV array would be installed with approximately 200 driven piles to a 10 feet depth. Only minimal excavation would be required for the trench connecting the solar array to the inverter pad and for the two concrete pads (inverter and BESS building). The Project area is located within an area of moderate to high potential for a damaging earthquake (Alaska Science Center 2024). Due to the minimal excavation and use of shallow (less than 10 feet deep) driven piles, negligible to minor impacts to geology would result. The Proposed Action would have no impact on seismic potential in the Project area during construction or the O&M phase.
Soils			X	The solar PV array would be installed with driven piles, minimizing disturbed areas and soil impacts. A short trench would be constructed between the array and the inverter pad. The trench would be backfilled with excavated soil. Two 10-foot by 20-foot concrete pads, one at the solar PV array site and one for the BESS building, would be installed within minimal to no excavation. Negligible to minor impacts to soils would result during construction. None of the impacted soils are used for agricultural purposes. The O&M phase would not impact soils.
Groundwater		X		Specific depth to groundwater information was not available for the Minto Project area. Information provided by the TCC noted that Minto's potable water supply is three deep groundwater wells (250 feet, 400 feet, 375 feet deep wells) (Sievers November 18, 2024). Based on this, it is unlikely that a shallow groundwater aquifer exists in the Project area. The Minto Project area is on elevated ground and is removed from water sources that would serve as a supply for a shallow aquifer. Thus, groundwater within 10 feet of the ground surface, where disturbance would occur, is not anticipated. No impacts to groundwater resources, including the potable water wells, are anticipated. The potable wells are substantially below site activities. Contamination of a shallow groundwater aquifer by O&M is not anticipated.
Wetlands		X		The Proposed Action would convert up to 0.5 acres of wetlands to construct a photovoltaic array in the

Table 1: Minto, AK site Resources Not Present; Present, not Affected; and Present, Potentially Affected				
Impact Topic	**Not Present**	**Present**		**Rationale**
		Not Affected	**Potentially Affected**	
				Villages of Grayling and Minto (up to 1 acre total). On January 14th and 23rd, 2025, TCC received verification that the work to be performed in the villages of Minto and Grayling would be authorized by Nationwide Permit No. 51, Land-Based Renewable Energy Generation Facilities. DA authorization is necessary because the Proposed Action would involve work in and/or placement of fill material into waters of the U.S.
Surface Waters		X		The closest surface water, approximately 625 feet to the east, is the Minto Flats water body (Google 2024). The surface waters would not be directly impacted, there would be no fill or discharges, and a SWPPP would be implemented during construction to prevent construction related discharges to any surface water (TCC n.d.2).
Floodplains	X			The Federal Emergency Management Agency (FEMA) does not have floodplain mapping available in Minto (FEMA 2024). However, the Project would not involve any fill (TCC n.d.3). Per information provided by the Applicant, both the solar PV array site and the BESS site would be outside and above any floodplains (TCC n.d.2).
Oceanic resources and coastal zones	X			The Project area is not located along the ocean or a coastal area (Google 2024).
Wildlife & Habitat			X	The solar PV array would impact an acre of boreal forest. Alaska's boreal forests are important habitats for migratory songbirds and other wildlife species. Migratory birds are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-711); Bald and Golden Eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). In addition, per the State Wildlife Action Plan, there is one species of concern in Alaska – the Great Gray Owl (ADF&G 2015). It is noted that the proposed power poles and the BESS building would be located in already disturbed areas with minimal to no wildlife habitat value. This topic is discussed in more detail in Section 3.3 of this EA.
Threatened and Endangered Species	X			Based on information available from the Alaska Department of Fish and Game (ADF&G) the following, non-marine and non-aquatic, threatened and endangered species exist in Alaska (ADF&G n.d.3): Wood bison (*Bison bison athabascae*) – use meadows and riparian areas along rivers (ADF&G n.d.2). No meadows or riverine riparian areas would be impacted. No suitable habitat for wood bison

Table 1: Minto, AK site Resources Not Present; Present, not Affected; and Present, Potentially Affected				
Impact Topic	**Not Present**	**Present**		**Rationale**
		Not Affected	**Potentially Affected**	
				exists in the Project area. Polar bears (*Ursus maritimus*) – not located in the Project area; their range is well north and west of the Project area (ADF&G n.d.1). Aleutian shield fern (*Polystichum aleuticum*) – only found on Adak, an island in the Aleutians (USFWS n.d.2)
Cultural Resources			X	Four recorded Alaska heritage resources are nearby (Sattler September 13, 2024). This topic is discussed further in Section 3.3.
Air Quality and GHG	X			The Project area is an air quality attainment area (EPA October 31, 2024). The General Conformity review (40 CFR Part 51 and 93) only applies to non-attainment and maintenance areas and is therefore not applicable to this Project. Additional information on the Proposed Action's potential for impact on air quality and GHG is discussed further in Section 3.3.
Socioeconomics		X		No displacements would occur. No change in social cohesion (i.e., the community would not be divided by any infrastructure) and no impact to any community facilities would occur. There would be no adverse impacts to socioeconomics. The Proposed Action would result in more reliable and lower-cost energy, which would result in a moderate to major beneficial impact.
Environmental Contamination and Waste Management		X		Based on information provided by the Applicant, no areas of known contamination exist in the Project area. Minimal excavation would occur for the trench between the solar PV array and inverter pad. Soils removed for the trench would be backfilled into the trench. Post construction, the eventual disposal of solar panels would be a waste concern. Disposal of solar PV panels would be handled in accordance with DOE's Photovoltaic End-of-Life Plan (SETO 2022). Disposal in accordance with this plan would result in a negligible to minor impact.
Noise and Vibration			X	Minto Community Hall and a few residences are located within 500 feet of the solar PV site. Residences are also located near where the BESS building would be installed. This topic is discussed further in Section 3.3.
Recreation	X			No recreational resources exist in the Project area (Google 2024).
Land Use and Aesthetics		X		The Proposed Action would clear one acre of forested area and convert the site to a solar PV array. While a change in land use would occur at the solar

Table 1: Minto, AK site Resources Not Present; Present, not Affected; and Present, Potentially Affected				
Impact Topic	**Not Present**	**Present**		**Rationale**
		Not Affected	**Potentially Affected**	
				PV site, impacts to the forested area are discussed further in Section 3.3 as part of the wildlife resource discussion. The change in land use would be negligible. The proposed solar PV array site is not easily visible from the village due to the presence of extensive areas of forested land that would remain post-construction. No visually sensitive areas have been identified based on information provided by the Applicant or through a view of aerial maps (TCC n.d.2 and n.d.3 and Google 2024). No aesthetic impacts are anticipated.
Utilities and Infrastructure			X	Two new power poles would be installed within an existing utility easement. The new BESS building would be added at the existing power plant site. Once constructed, O&M of the proposed solar PV array and associated infrastructure would be minor and funded as discussed in Section 2.1. The Proposed Action would have a moderate to major beneficial impact on the utility provider due to providing a more reliable and less expensive energy source.
Transportation and traffic		X		No changes to the transportation network would result from the Proposed Action.
Potential environmental impacts of intentional destructive acts (i.e. acts of sabotage or terrorism) per DOE policy dated December 1, 2006.[2].	N/A			Due to the remote, seasonally accessible, nature of the Project area, an intentional destructive act by actors outside of the village is highly unlikely. Because the Proposed Action is intended to highly benefit the village, an intentional destructive act by a village member is also unlikely. Should an intentional or unintentional act of destruction occur, the village power plant would be able to revert to diesel generated power until the solar PV array and associated infrastructure could be repaired. There is a negligible to minor likelihood of an intentional or accidental act of destruction related to the Proposed Action. If an act did occur, any impact would be mitigated to a minor level through switching back to diesel fueled power.

Table 2: Grayling, AK site Resources Not Present; Present, not Affected; and Present, Potentially Affected				
Impact Topic	**Not Present**	**Present**		**Rationale**
		Not Affected	**Potentially Affected**	
Geology			X	Same rationale as presented in Table 1.
Soils			X	Same rationale as presented in Table 1.
Groundwater		X		Depth to groundwater is not known for the Grayling Project area; however, groundwater is not used as a drinking water source (Sievers November 18, 2024). Due to the nature of Project activities (installing shallow, less than 10 feet deep piles and construction

[2] Need to Consider International Destructive Acts in NEPA Documents (energy.gov)

Table 2: Grayling, AK site Resources Not Present; Present, not Affected; and Present, Potentially Affected				
Impact Topic	**Not Present**	**Present**		**Rationale**
		Not Affected	**Potentially Affected**	
				of a shallow trench and two concrete pads on grade), impacts to groundwater are not anticipated, and no drinking water sources would be affected.
Wetlands		X		Same rationale as presented in Table 1.
Surface Waters		X		The closest surface water, approximately 1,300 feet to the east, is the Yukon River (Google 2024). Information provided by the TCC noted that Grayling's potable water supply is surface water from Grayling Creek (Sievers November 18, 2024). Grayling Creek is located over 250 feet from the proposed solar PV array and over 650 feet from the existing power plant where the BESS building would be installed (Google 2024). The proposed trench connecting the solar array with the inverter pad would not cross Grayling Creek. Aerial power lines would cross the creek on existing and one proposed power pole within an existing cleared utility easement. The surface waters would not be directly impacted and a SWPPP would be implemented during construction to prevent construction related discharges to any surface water (TCC n.d.4).
Floodplains	X			Same rationale as presented in Table 1.
Oceanic resources and coastal zones	X			Same rationale as presented in Table 1.
Wildlife & Habitat			X	Same rationale as presented in Table 1.
Threatened and Endangered Species	X			Same rationale as presented in Table 1.
Cultural Resources		X		Seven resources are located within Grayling. This topic is discussed further in Section 3.3.
Air Quality and GHG	X			Same rationale as presented in Table 1.
Socioeconomics		X		Same rationale as presented in Table 1.
Environmental Contamination and Waste Management		X		Same rationale as presented in Table 1.
Noise and Vibration			X	A few residences are located within 500 feet of the solar PV site. Residences are also located near where the BESS building would be installed. This topic is discussed further in Section 3.3.
Recreation	X			Same rationale as presented in Table 1.
Land Use and Aesthetics			X	Same rationale as presented in Table 1.
Utilities and Infrastructure			X	Same rationale as presented in Table 1.
Transportation and traffic		X		Same rationale as presented in Table 1.
Potential environmental impacts of intentional destructive acts (i.e. acts of sabotage or terrorism) per DOE policy dated December 1, 2006	N/A			Same rationale as presented in Table 1.

3.3. Affected Environment and Impacts Analysis

This section describes the affected environment for those resources identified in Tables 1 and 2 as needing additional analyses, including Wildlife and Habitat, Cultural Resources, Air Quality and GHG, and Noise and Vibration. This section documents anticipated impacts to those resources from the Proposed Action, including reasonably foreseeable activities. As discussed in Section 2.5, the only reasonably foreseeable environmental trend or planned actions in Minto and Grayling is the Proposed Action.

3.3.1. Wildlife and Habitat

3.3.1.1. Description of the Affected Environment

The Minto solar PV site is an immature boreal (northern) forest dominated by black spruce (*Picea mariana)* and a few Alaska paper birch (*Betula neoalaskana*) and balsam poplar (*Populus balsamifera*) (Gillespie October 3-5, 2024). The Grayling solar PV site is a boreal forest dominated by paper birch with some interspersed black spruce (Gillespie October 17-18, 2024). The understories are mixed grasses and other broadleaf plants.

Most of Interior Alaska is boreal forest with around 107 million acres of such forest (ADF&G 2015). Nearly 40 percent of Alaska's boreal forests are in protected or conservation areas. Birds represent the largest class of vertebrates (animals with a backbone) in the boreal forests. The State Wildlife Action Plan notes that boreal spruce forests (Minto) tend to have lower bird densities and variety of species than deciduous forests (Grayling) (ADF&G 2015). According to the State Wildlife Action Plan, Alaska's boreal forests are considered healthy.

Alaska's boreal forests are important breeding grounds for many migratory songbirds (ADF&G 2015). Bird species dependent on land habitats are the largest and most ecologically diverse component of Alaska's bird populations. Most landbird species are migratory, and four major global migration flyways merge in Alaska. As a result, birds travel to breed in Alaska from all over the world, and reproductive success in Alaska affects bird populations in both North and South America. Alaska's largest area of landbird habitat is interior boreal forest (ADF&G 2015). Migratory birds are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-711).

Predatory birds such as owls and eagles can also be found in Alaska's interior boreal forests. The largest owl in the world, the Great Gray Owl, is found, in part, throughout the boreal forests of Interior Alaska and is a Species of Conservation Need in Alaska per the State Wildlife Action Plan (ADF&G 2015). It hunts in openings, such as meadows or fields, adjacent to the forest. Depending on the practices used, tree clearing can impact owls positively (by creating small openings in which they hunt) or negatively (by creating openings too large for hunting or removing snags used for nesting and perching).

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). Alaska has the largest population of bald eagles in the U.S. (ADF&G n.d.4). The highest number of nesting bald eagles are found in the islands of Southeast Alaska, but bald eagles are often found around interior lakes and rivers, such as those to the east of both the Minto and Grayling Project areas. Bald eagles tend to nest high in trees close to water. Golden eagles are also found in interior Alaska, typically in open wooded country (ADF&G n.d.5). They typically nest on rocky cliffs but have been known to nest in large trees.

3.3.1.2. Impact Analysis of the Proposed Action

As noted, the Proposed Action includes installation of power poles (two for Minto and one for Grayling) within existing cleared utility easements and installation of a concrete pad and BESS building at the existing power plant sites, which are also cleared and developed. The construction and O&M activities at the existing already cleared utility easements and power plant sites would have no or negligible impacts on wildlife and habitats.

The clearing of one acre of forested land each at Minto and Grayling for the proposed solar PV array sites would result in impacts to boreal forest habitat and temporary disturbance to species that occur within the Project area. The loss of two acres of forestland is negligible to minor when compared to the vast amount of healthy boreal forests that exist within Interior Alaska (107 million acres). Because extensive habitat area would remain for songbirds, the Great Gray Owl, and eagles, negligible impacts to habitat for such species would be anticipated. During construction, noise and the presence of humans may displace bird and other wildlife species temporarily. The greatest concern for displacement would be to nesting species that are rearing young. Most bird species, including the Great Gray Owl, Bald Eagle, and Golden Eagle, nest and rear young in the spring to early summer

months (ADF&G n.d.4, n.d.5, & n.d.6). TCC would conduct a visual inspection of the proposed solar PV array sites just prior to construction to determine whether any nesting owls or eagles may be present. If active Great Gray Owl, Bald Eagle, or Golden Eagle nests are present, monitoring of the birds' activities should be conducted and tree clearing should be on-hold until it is determined that identified nests are inactive. With these measures in place, the Proposed Action's impact on wildlife, including the need for conservation of the Great Gray Owl and protected eagle nests, would be minor.

During the O&M phase of the Project, wildlife, including birds would be expected to adjust to the presence of the solar PV array and no impact on wildlife would be anticipated. It is noted that solar PV panels have been of concern related to migrating birds and bats, including concerns over glare and potential disruption to wildlife flight patterns (Hathcock 2018). However, more recent research has shown that birds use solar fields for habitat and do not seem to be impacted by the presence of the solar panels (SETO October 24, 2024). While research is ongoing, it appears that the presence of the solar PV array would have a negligible impact on birds. As noted, the addition of power poles and the BESS building within existing cleared and developed areas would have no impact on wildlife during the O&M phase.

The State Wildlife Action Plan mentions that wildfire concerns are growing with continual warming of the climate (ADF&G 2015). Research is ongoing into the emerging issue of the role of solar panels and solar fields on the potential for fires. Some research shows that the primary concern for fires is improperly installed and maintained solar panel systems (Vaverková 2022). Proper inspections and oversight of construction activities should be conducted to ensure proper installation of the proposed systems. The same research indicates that maintenance of vegetation under and around the solar PV field is also important, especially during dry, warm weather conditions. As mentioned in Section 2.1, TCC has a plan for funding and continuing O&M after the Proposed Action would be constructed. The O&M plan should include periodic and ongoing maintenance of vegetation under and near the solar PV array to reduce the risk of fire. Careful adherence to construction specifications during installation and a proper O&M plan after construction would reduce the risk for fires and would result in a negligible impact on fire risks in the Project areas.

3.3.1.3. Impact Analysis of No-Action Alternative

The No-Action Alternative would result in no change from existing conditions and would not contribute to any reasonably foreseeable impacts to wildlife or wildlife habitat.

3.3.1.4. Reasonably Foreseeable Impacts Analysis

As stated in Section 2.5, there are no reasonably foreseeable future actions in these Project areas. Past actions included the development of the villages and associated infrastructure. The Proposed Action would have a negligible to minor impact on wildlife and habitat (boreal forest) during construction and no or negligible impacts during the O&M phase. Because the Proposed Action would result in the clearing of up to two acres of boreal forest land, within approximately 107 million acres of similar habitat, reasonably foreseeable impacts from the Proposed Action would be negligible to minor. The following measures would help ensure impacts of less than minor:

- A visual inspection of the proposed solar PV array sites should be done just prior to construction to determine whether any nesting owls or eagles may be present. If active Great Gray Owl, Bald Eagle, or Golden Eagle nests are present, monitoring of the birds' activities should be conducted and tree clearing should be on-hold until it is determined that identified nests are inactive.
- Inspections and oversight of construction activities should be conducted to ensure proper installation of the proposed systems to reduce fire risks.
- A proper O&M plan, that includes vegetative maintenance, especially during warm, dry weather conditions, should be implemented to further reduce the risk of fires.

3.3.2. Cultural Resources

3.3.2.1. Description of the Affected Environment

The proposed Minto solar PV array is located adjacent to the Neal Charlie Native allotment where cultural

resources have been documented (Sattler September 13, 2024). There are four recorded Alaska Heritage Resources sites in the immediate vicinity of the solar PV Area of Potential Effects (APE) in Minto:

1) LIV-0449 (early 20th century seasonal camp with precontact archeological material)
2) LIV-0248 (Chief Charlie's cabin residence)
3) LIV-0448 (two historic burials)
4) LIV-0069 (precontact lithic tool remains)

The Grayling BESS facility is located in the central portion of the village where there are seven cultural sites documented (Sattler September 13, 2024). These include:

1) XHC-001 (a general identifier of the village of Grayling)
2) XHC-0034 (The Deacon Fish camp that has been determined eligible for the National Register of Historic Places – located south of the Project area)
3) XHC-0086 (New Grayling, related to the middle 20th century establishment of the village after its move from Holikachuk following a flood of that village)
4) XHC-0087 (Old Grayling referring to a series of ground pits that are considered eligible for the National Register, located south of the Project area)
5) XHC-0088 (a separate group of 11 ground pits believed to be semi-subterranean house pits and caches – also south of the Project area)
6) XHC-0154 (precontact stone tool remains)
7) XHC-0155 (stone tool remains considered not eligible for the National Register)

Of these, only XHC-154 and XHC-0155 are located near the Grayling Project APE adjacent to the proposed BESS site. These two sites are considered isolated finds and are described as areas where ground disturbing activity has compromised the integrity of the cultural sites. The proposed Grayling solar PV array site is on elevated terrain similar to where previous archeological discoveries have been located. A modern cemetery is located more than a half mile north of the APE for the proposed solar PV array.

Due to the presence of these cultural resources in the vicinity of the APE, a field survey was conducted at both Grayling and Minto Project sites to document the potential for archaeology resources.

3.3.2.2. Impact Analysis of the Proposed Action

No aboveground cultural resources are located in the vicinity of either proposed solar PV array. No aboveground cultural resources would be directly impacted by the Proposed Action. The proposed solar PV arrays are both located in vacant forested areas. Two proposed utility poles at Minto and one pole at Grayling are both within existing utility easements and would not substantially change the appearance of or to the easement areas. The proposed BESS buildings are located within previously disturbed areas already in use as power plants. The addition of the small (10 feet by 20 feet) BESS buildings would be consistent with the current land use and would not substantially alter the view of or from the existing power plant site. For these reasons, no above ground cultural resources would be impacted.

In October of 2024, a qualified archaeologist completed a field observation of both Project APEs that included excavation of a shovel test pits (STP) to determine the potential for archaeological resources in the Project APEs. The STPs were screened and examined for cultural materials (Gillespie October 3-4 and 17-18, 2024). The field survey observed that the APEs demonstrated previous ground disturbance from village infrastructure projects unassociated with the proposed photovoltaic Project. Disturbed sediment and soils were observed for archeological materials and undisturbed sediment were probed for possible buried artifactual remains. Based on the field survey, the areas possess low probability for undisturbed archeological material, and none were identified during the field surveys.

DOE received concurrence from AK SHPO on March 6, 2025, on DOE's finding of no historic properties affected by the activities proposed in the Village of Grayling. DOE received concurrence from AK SHPO on April 12, 2025, on DOE's finding of no historic properties affected by the activities proposed in the Village of Minto.

3.3.2.3. Impact Analysis of No-Action Alternative

The No-Action Alternative would result in no changes in the Project area and would have no impacts on any cultural resources.

3.3.2.4. Reasonably Foreseeable Impacts Analysis

As stated in Section 2.5, there are no reasonably foreseeable future actions in these Project areas. Past actions included the development of the villages and associated infrastructure. The Proposed Action would not impact cultural resources and therefore would not contribute to any reasonably foreseeable impacts to cultural resources. The No-Action Alternative would result in no change from existing conditions and would not contribute to any reasonably foreseeable impacts to cultural resources.

3.3.3. Air Quality and GHG

3.3.3.1. Description of the Affected Environment

As noted in Tables 1 and 2, the Project areas are in air quality attainment and do not require a Conformity Analysis.

GHG emissions released into the atmosphere from human-induced fossil fuel combustion contribute to global climate change. As mentioned in Section 2.1, the current source of electric power for both Minto and Grayling is diesel fuel generation which produces GHG emissions.

3.3.3.2. Impact Analysis of the Proposed Action

During construction of the Proposed Action, the operation of construction equipment would have a temporary negligible to minor impact on air quality, which would return to no measurable adverse effects following completion of construction. The contractor should ensure that construction equipment is fitted with properly functioning emissions controls and limit vehicle idling to the extent possible.

Following construction, during the O&M phase, generation of electricity using solar power would reduce the use of diesel fuel. Reduced use of diesel fuel would reduce GHG emissions from both Minto and Grayling power plants. A moderate beneficial impact on production of GHGs would result.

3.3.3.3. Impact Analysis of No-Action Alternative

The No-Action Alternative would result in continued use of diesel fuel to produce electrical power for Minto and Grayling. No reduction in GHG emissions would result.

3.3.3.4. Reasonably Foreseeable Impacts Analysis

As stated in Section 2.5, there are no reasonably foreseeable future actions in these Project areas. Past actions included the development of the villages and associated infrastructure. The Proposed Action would result in a reduction of GHG emissions, which would produce a beneficial reasonably foreseeable impact on (reduction in) GHGs. The No-Action Alternative would result in no change from existing conditions and would continue to result in adverse GHG reasonably foreseeable impacts due to continued use of diesel fuel for power generation.

3.3.4. Noise and Vibration

3.3.4.1. Description of the Affected Environment

The human ear can hear a wide range of sound levels, and as a result, noise levels are described on a logarithmic scale and are quantified in terms of decibels (dB), a unit that is typically adjusted to dBA. “dBA” is the decibels on an A-weighted scale to account for the sensitivity of the human ear. Sounds at or below 70 dBA are generally considered safe (CDC 2022). The U.S. Environmental Protection Agency and the World Health Organization recommend maintaining environmental noises below 70 dBA over 24 hours and below 75 dBA over eight hours to prevent noise-induced hearing loss. Over two hours of continuous noise levels between 80 to 85 dBA has the potential to lead to hearing damage (CDC 2022).

The Occupational Safety and Health Administration (OSHA) noise standard (29 CFR 1910.95) establishes minimum workplace noise requirements and states that constant noise exposure must not exceed 90 dBA over an eight-hour period. The highest allowable sound level for constant exposed is 115 dBA, which must not exceed 15 minutes within an eight-hour period. The standards limit instantaneous exposure (impact noise) to 140 dBA. If

noise levels are exceeded, employers must provide hearing protection equipment (OSHA 2008).

Noise-sensitive receptors near the Minto Project area include the Minto Community Center and residences; near the Grayling Project area they include residences.

Vibration can lead to disturbance or structural damage to nearby facilities. Vibration can be caused by operating heavy construction machinery and ground-breaking construction activities (e.g., excavation or pile driving). The effects of vibration range from feeling the floor shake and experiencing rumbling sounds to structural damage. Vibration is expressed in terms of the peak particle velocity (PPV), in inches per second, when used to evaluate human annoyance and building damage impacts. Vibration levels are highest closest to the source and dissipate with increasing distance, generally at a rate of Dref/D, where D is the distance from the source in feet, and Dref is the reference distance of 25 feet. Other factors that affect vibration include soil conditions and the type of equipment and vibration (i.e., continuous or transient). There are no federal standards for vibrations; however, various researchers and organizations have published guidelines.

Table 3. Noise Levels of Common Construction Equipment.

Equipment	Typical Noise Levels (dBA) at varying distances[a]		
	50 feet	500 feet	1,000 feet
Backhoe	80	60	54
Concrete mixer	85	65	59
Loader	80	60	54
Truck	84	64	58
Pile Driver (impact)	101	77	70

[a.] *Source: FTA 2018*

For historic buildings, appropriate vibration limits vary. A conservative PPV limit of 0.1 inch per second may be used, while 0.5 inch per second or even 0.2 inch per second may be considered appropriate (Wilson Ihrig et al. 2012). For structures not designated as historic, typical PPV vibration thresholds are 0.5 inch per second for buildings structurally sound and designed to modern engineering standards and 0.3 inch per second for buildings that are found to be structurally sound but where structural damage is a major concern. For the purposes of this analysis, conservative PPV limits of 0.1 inch per second and 0.3 inch per second are used to determine potential vibration impacts to historic structures and non-historic structures, respectively.

Humans are generally considered less sensitive to transient (impulsive) vibration, than to similar vibration from continuous (steady state) sources. For this analysis, a PPV limit of 0.2 inch per second was used for potential human response to vibration.

3.3.4.2. Impact Analysis of the Proposed Action

Noise levels from multiple sources combine logarithmically, with increases depending on the difference in decibels. Near-equal sources result in a combined increase of about 3 dBA, whereas differences of over 10 dBA result in no increase over the higher noise source (NRC 2012).

Typical noise levels of various construction equipment that is anticipated to be utilized during construction of the Proposed Action is shown in Table 3. During construction the proposed solar PV array sites would be cleared with (likely equipment) chainsaws, a backhoe, and a truck. Trucks would bring the solar panels to the site where a pile driver would be used to install the panel foundations. It is anticipated that the only equipment operating during the pile driving operation would be the pile driver (101 dBA), which is the loudest noise source in Table 3 (even if other equipment operated simultaneously as the dBA from that piece of equipment is more than 10 dBA higher than noise from other equipment). Due to the loudness of the pile driver, construction personnel on site during the pile driving operation should be provided with and wear hearing protection. Following pile driving operations a backhoe would be anticipated to be used to install the trench from the solar panels to the inverter pad. A concrete mixer and other trucks would likely be operating during installation of the 10 feet by 20 feet pad.

However, as mentioned, even with this equipment operating simultaneously, the pile driving operation would still produce the loudest and most intrusive noise during construction.

In Minto, the closest residence is around 150 feet and the Community Hall is about 350 feet from the proposed solar PV site. In Grayling, the closest residence is about 200 feet from the site (Google 2024). Based on Table 3, an extrapolated exterior noise level at the Minto residence during the pile driving operation would be about 96 dBA, 85 dBA at the Minto Community Hall, and at the Grayling closest residences noise levels would be about 93 dBA.

Standard buildings typically provide ten dB of noise reduction between exterior and interior noise levels with windows open, and 20 dB with windows closed (FHWA 2018). Therefore, inside the Minto residence noise would be at approximately 86 dBA, 75 dBA at the Community Hall, and 83 dBA at the Grayling residence with windows opened. With closed windows, the temporary construction noise during the pile driving operation would be approximately 76 dBA, 65 dBA, and 73 dBA, respectively. Noise from the pile driver would not be continuous but would instead be an impact source that occurred sporadically while piles were being driven. Approximately 200 piles would be driven at each site. The time it would take to install the piles would vary depending on site conditions. However, it is expected that nearby residences and the Minto Community Hall would be moderately impacted by construction noise for several months. Nearby residences and the Community Hall should be notified prior to the start of construction activities, particularly the pile driving operations. Pile driving operations should be limited to daytime hours. Events and meetings scheduled to be held at the Minto Community Hall should be coordinated with the contractor to avoid pile driving operations during the times the meetings and events are held.

Installation of the additional power poles (two at Minto and one at Grayling) would be a short-term operation, anticipated to be less than one day each, occurring within an existing utility easement. Some minor to moderate temporary increase in noise levels near where the poles would be installed would occur. Construction at the power plant sites for installation of the 10 feet by 20 feet pads and placement of the BESS buildings, along with other electrical and infrastructure connections, would be anticipated to be completed with trucks to haul equipment to the site, a concrete mixer, and a backhoe or similar machine (i.e., forklift) to place the BESS building. The noise level with all of this equipment operating simultaneously would be approximately 86 dBA. In Minto, the closest residence to the proposed BESS site is about 200 feet away and, in Grayling, approximately 100 feet. Exterior noise levels at these locations would be estimated at 80 dBA in Minto and 84 dBA in Grayling. Interior noise levels with windows open would be 70 dBA and 74 dBA, respectively, and 60 dBA and 64 dBA with windows closed. During the construction operations, a minor to moderate noise impact would occur. Again, nearby residences should be notified prior to construction commencing. Construction equipment should not be allowed to idle to reduce continuous noise sources and should be fitted with properly functioning mufflers.

While minor to moderate noise impacts would be expected during construction operations, these impacts would be temporary in nature, lasting only as long as construction. Elevated noise levels would dissipate once construction operations ceased. To minimize disruptions to nearby residences and the Minto Community Hall, construction should be limited, to the extent possible, to daylight hours.

During the O&M phase, there would be no noise impacts caused by operations or maintenance of the solar PV system and associated equipment. However, noise levels in the villages may decrease due to reduced operation of diesel-powered generators for electric production. A minor reduction in noise levels may result during the O&M phase.

Adverse impacts from construction vibration may occur due to the operation of heavy machinery. Primary construction activities with the Proposed Action that could result in vibration impacts would include potential installation of the solar PV array foundations (driven piles) and excavation of the trench from the solar PV arrays to the inverter pads. Table 4 presents average source PPVs at varying distances for the types of construction equipment most likely to be used during construction of the Proposed Action. These values are compared to the PPV limits discussed previously to evaluate potential for structural damage and the effects of human response from vibration.

Table 4. Vibration Levels for Construction Equipment at Various Distances from the Source.							
Construction Equipment	PPV (inches per second) at						
	25 feet[a,b]	50 feet	70 feet	100 feet	150 feet	200 feet	400 feet
Large bulldozer	0.089	0.045	0.032	0.022	0.015	0.011	0.006
Loaded trucks	0.076	0.038	0.027	0.019	0.013	0.010	0.005
Small bulldozer	0.003	0.002	0.001	0.001	0.001	0.0004	0.0002
Pile Driver (impact)	0.644	0.322	0.230	0.161	0.107	0.008	0.004

[a] *Source of PPV at 25 feet: FTA 2018*
[b] *Estimated vibration levels are highest closest to the source and dissipate with increasing distance at a rate of Dref/D.*

As noted earlier, PPV values potentially causing structural impacts are 0.1 inch per second for historic structures and 0.3 inch per second for non-historic structures. Vibration levels causing a human response (annoyance) are approximately 0.2 inch per second. In Minto, the closest building to the proposed solar panel site is about 150 feet away and in Grayling, the closest building is about 200 feet away. Based on Table 4, and assuming operation of an impact pile driver, the PPV would be 0.107 inches per second within 150 feet of the pile driving operation. This could cause damage to a historic structure but would be unlikely to damage non-historic structures. The closest building in Minto is not historic. The Minto Community Hall is over 350 feet from the proposed solar array site and would not be impacted by vibration based on the values in Table 4. In Grayling, the closest building is also far enough away that it would not be impacted by vibration whether it was historic or non-historic.

In the areas where the proposed power plant modifications would occur, including installation of the pad for and placement of the BESS building, the closest Minto building is 50 feet away and Grayling is about 65 feet away from the construction area. As mentioned, at this construction site, loaded trucks and a small bulldozer (forklift) would be operating. The PPV levels for this type of construction equipment are well less than the PPV levels that would cause impact (0.1 inches per second for historic buildings, 0.3 inches per second for non-historic, and 0.2 inches per second for human annoyance).

No vibration impacts to nearby buildings or in terms of human annoyance would be anticipated during construction.

During the O&M phase, there would be no vibratory impacts caused by operations or maintenance of the solar PV system and associated equipment.

3.3.4.3. Impact Analysis of No-Action Alternative

No construction would occur with the No-Action Alternative. There would be no change in noise levels from existing and no vibratory impacts.

3.3.4.4. Reasonably Foreseeable Impacts Analysis

As stated in Section 2.5, there are no reasonably foreseeable future actions in these Project areas. Past actions included the development of the villages and associated infrastructure. The Proposed Action would result in a temporary increase in noise levels during construction, which would return to existing after construction is completed and would not result in any reasonably foreseeable increases in noise. During O&M of the Proposed Action, a minor decrease in noise levels within the villages may result due to reduced operation of diesel-powered generators for power production. This minor decrease in noise would have a beneficial reasonably foreseeable impact on noise levels in the villages. The No-Action Alternative would result in no change in noise levels from existing conditions.

3.4. Relationship of Short-Term Uses and Long-Term Productivity

Short-term use of the environment, as the term is used in this document, is during construction of the Project, whereas long-term productivity refers to when the solar PV array and associated infrastructure are operational and in-use. The short-term use of the Project site for the Proposed Action would not affect the long-term productivity of the Project area.

SECTION 4 LIST OF AGENCIES AND PERSONS CONSULTED AND PREPARERS

List of Agencies and Persons Consulted

Name	Title	Organization	Role
Molly A. Herron	Archaeologist - Review and Compliance Unit	Alaska State Historic Preservation Office	Section 106 NHPA compliance
Heidi Zimmer	Regulatory Specialist	Alaska District, U.S. Army Corps of Engineers	Clean Water Act compliance

List of Preparers

Name	Title	Organization	Role	Document Section(s)
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Michael Kuca	Project Manager	DOE	Reviewer	Environmental Assessment
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SECTION 5 APPENDICES

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