

Visual Impact Assessment

Rail Tie Wind Project Albany County, Wyoming



Prepared for:

ConnectGen Albany County LLC

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1 INTRODUCTION

At the request of ConnectGen Albany County LLC (ConnectGen), Tetra Tech, Inc. (Tetra Tech) has prepared this Visual Impact Assessment (VIA) for the Rail Tie Wind Project (Project). This document is intended to provide reviewing regulatory agencies with information on potential visual impacts resulting from development of the Project.

The VIA contained herein includes a detailed description of the Project components that were evaluated (Section 2); a summary of the regulatory requirements and drivers behind the analysis conducted (Section 3); a detailed discussion of the methods used to identify the visual study area and inventory visual resources potentially affected by the construction and operation of the Project and a detailed discussion of the methods used to evaluate impacts (Section 4); a summary of existing conditions and visual resources within the visual study area (Section 5); a summary of potential effects (Section 6) and proposed Environmental Protection Measures (EPMs) to address potential visual impacts as a result of the Project (Section 7).

1.1 Project Background

The Project is located in southeastern Albany County, Wyoming, and encompasses approximately 26,000 acres of rangeland on private and state lands near Tie Siding, Wyoming (Project Area; Figures 1 and 2). The Project would include up to 149 wind turbine generators (WTGs), each ranging between 3.0 to 6.0 megawatts (MW) in size, with a combined maximum generating capacity rating of 504 MW. The Project proposes to interconnect to the existing transmission system of the Western Area Power Administration (WAPA) via the Ault-Craig 345-kilovolt (kV) transmission line, which runs through the Project Area.

For construction planning and site optimization, the Project consists of two separate phases, each approximately 252 MW. Construction of the Project is expected to begin in 2021, and both phases could be fully operational by the end of 2022. As is common with large wind projects, the Project may require two years to fully construct. If additional time is required to facilitate construction, it is anticipated that the first 252 MW phase would be completed and fully operational by the end of 2022, and the second phase operational in 2023. Although the Project would be developed in phases, this VIA analyzed full build-out of the Project.

2 PROJECT DESCRIPTION

This section describes the location of proposed Project components reviewed for potential visual effects in this VIA.

Wind Turbine Generators

The WTGs installed for the Project would be three-bladed horizontal-axis machines. The rotor would be attached to a nacelle containing the electrical generator and other equipment. The nacelle would sit on top of a tubular support tower. Wind energy causes the blades on a wind

turbine to rotate, which turns a generator that transforms the kinetic energy of the air into electricity.

Between 84 and 151 turbines would be installed for the Project. The total number of turbines would depend on the turbine model selected and final Project design. ConnectGen is currently considering several turbine models with generating capabilities between 3.0 MW and 6.0 MW each. Of the turbine models being considered by ConnectGen, the smallest model would be the General Electric Company (GE) 3.0 MW, and the largest would be the Siemens Gamesa 6.0 MW or the Vestas 5.6 MW. Each turbine, with associated foundations and equipment, would have a permanent physical footprint of approximately 0.1 acre and a vertical height of 500 feet (ft) to 675 feet, depending on the turbine type selected.

The wind turbines would be arranged in collinear strings located within 1,000-foot-wide wind turbine siting corridors. This corridor design approach provides flexibility in turbine placement during the design phase to avoid and minimize impacts wetlands, waterbodies, cultural sites, and other environmentally sensitive areas, to the extent practicable. The precise locations of each turbine within the siting corridor would be based on the wind turbine model selected, various siting criteria such as optimal wind speed, geotechnical conditions, environmental considerations, and landowner requested setbacks. For reference, Figure 1 depicts a representative Project layout for a 3 MW turbine model, and Figure 2 depicts a representative Project layout for a 6 MW turbine model.

This VIA evaluated two turbine scenarios based on the maximum number of representative 3 MW and 5.6 MW turbines being considered that could be observed from within the visual study area. The Vestas 5.6 MW model was used as the maximum representative turbine height because it has a total turbine height that is higher than the Siemens Gamesa 6.0 MW model. Table 1 provides a summary of the parameters for the proposed minimum and maximum representative turbine heights.

Table 1: Parameters for the Proposed Minimum and Maximum Turbine Height Scenarios

Parameter	Minimum Representative Turbine Height (GE 3.0 MW)	Maximum Representative Turbine Height (Vestas 5.6 MW)
Total Number	151	87
Tower Type	Tubular	Tubular
Blade (Rotor) Diameter	417 ft (127 m)	531 ft (162 m)
Hub Height	292 ft (89 m)	410 ft (125 m)
Total Turbine Height	500 ft (152.5 m)	675 ft (206 m)

Note: m =meter

Access Roads

Temporary and permanent all-weather access roads including new, improved, or existing access roads, may be necessary for both construction and operation of the Project. New, permanent all-weather access roads would be needed to access each wind turbine location during operation,

and existing or improved public roadways may be used as well. Based on initial estimates, approximately 60 miles of new, 20-foot wide, all-weather access roads would be constructed for the Project.

Electrical Collection System

Underground collection lines are proposed to connect wind turbines and deliver power from each turbine to the Project substations. If necessary due to the geology or topography, overhead collection lines may be used in some areas. Underground collection typically entails 34.5 kV electric cable buried to a depth of approximately 48 inches, while overhead collection consists of 34.5 kV electric lines strung from vertical wooden monopoles ranging in height from 50 to 80 ft tall. The total length of collection would be determined based on the final design and siting of turbine arrays and substations, but they could include up to 80 miles of collection facilities. To the extent possible, the electrical collection system will be co-located with access roads in areas likely already disturbed by the road construction.

Electrical Substation and Switching Station

The Project would include two 345 kV substations, one for each phase of the Project. Each substation site would encompass a fenced area of up to 5 acres, containing one to two main power transformers depending on the phase. Other electrical equipment would include outdoor control cabinets, transformers, switchgears, bus work, steel support structures, static masts, a small control building that would house electrical metering equipment and the supervisory control and data acquisition (SCADA) system for the wind turbines, and perimeter chain-link fence.

A 345 kV switching station (switchyard), operated and maintained by WAPA, would be required to connect both phases of the Project to the existing Ault-Craig 345 kV transmission line. The switchyard would be designed based on the findings of WAPA's facilities studies; however, a typical 345 kV switching station encompasses a fenced area of up to 8 acres of land.

345 kV Electric Transmission Line

Approximately 4 miles of new single circuit, 345 kV overhead transmission line would connect the two Project substations to the WAPA switchyard. The transmission line structures would likely be wood H-frame or steel monopoles as determined based on final engineering and design of the transmission line. Structure height would typically be 100 to 125 ft but may vary depending on terrain.

Operations and Maintenance Facility

A single operations and maintenance (O&M) facility is proposed for the Project. The proposed O&M facility would include an approximately 7,000-square-ft building, complete with sanitary and electrical services, located within an approximately 5-acre security fenced area. The O&M facility would house storage for spare parts, offices for wind farm staff, conference rooms, computers, telecommunications and control equipment for the wind turbines, SCADA equipment, emergency lodging quarters, and shop facilities. There would also be a parking lot and temporary laydown area. This building would likely be pre-engineered and assembled and finished onsite. The O&M

facility would be painted in an earth-tone color (such as light tan) conducive to the local site conditions.

Meteorological Equipment

At least three 344-ft-tall meteorological towers would be constructed for the Project. Meteorological towers would likely be self-supported, lattice-mast style towers used to collect data such as wind speed and direction, barometric pressure, humidity, and ambient temperature. ConnectGen has identified 12 potential meteorological tower locations but would select the final locations upon selection of a turbine type and finalization of Project design.

3 REGULATORY FRAMEWORK

3.1 Federal Regulations

3.1.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires the disclosure of potential environmental impacts for projects with a federal action, through either a Categorical Exclusion, Environmental Assessment, or Environmental Impact Statement (EIS), as well as a process of public and agency review and comment.

WAPA's action on the interconnection request is considered a major Federal action subject to NEPA, in accordance with Council on Environmental Quality (CEQ) regulations for implementing NEPA, and U.S. Department of Energy NEPA Implementing Procedures (40 CFR Parts 1500–1508, 10 CFR Part 1021). This technical report provides information to assist WAPA in analysis of the potential effects to the natural and human environments associated with approving or denying the interconnection request.

The federal government has not adopted laws or regulations that provide specific protection for visual resources on privately owned lands or specific direction for assessment of impacts to such resources. NEPA and its implementing regulations include visual resources as an element of the human environment to be considered in assessing the impacts of an action, but they do not specify how that assessment is to be conducted. While various federal laws, regulations, and guidelines address treatment of visual resources on federal lands, those measures are specific to the federal lands under the jurisdiction of federal land management agencies such as the U.S. Bureau of Land Management (BLM) and the U.S. Forest Service (USFS). To provide a systematic basis for evaluating visual resources, the description of existing visual resources and the assessment of potential impacts to those resources are based on the Visual Resource Management (VRM) System developed by the BLM. The methodology used for this VIA is discussed further in Section 4.

3.2 State Regulations

3.2.1 Wyoming Industrial Development Information and Siting Act

The Wyoming Department of Environmental Quality (WDEQ) Industrial Siting Division (ISD) administers the Wyoming Industrial Development Information and Siting Act (Act; Wyoming Statute § 35-12-101:119) and the Rules and Regulations of the Industrial Siting Council (ISC), Chapters 1 and 2. The Act is designed to protect Wyoming's environmental, social and economic fabric of communities from unregulated large-scale industrial development. By consolidating the review of 19 independent state agencies into one comprehensive permitting process, the Act offers a thorough analysis of the development's impacts to the public and affected agencies.

Pursuant to the Act, all wind energy projects consisting of 30 or more turbines (in all planned phases of the installation) and/or exceeding the statutory threshold construction cost amount of \$222.8 million are subject to review and approval by the ISC. For facilities permitted under Wyoming Statute (W.S.) § 35-12- 102(a)(vii)(E) and (F), a site reclamation and decommissioning plan and a financial assurance plan are required pursuant to W.S. § 35-12-105(d) and (e).

As part of the review and approval process, the ISC requires submittal of an application outlining the evaluation of potential project impacts and mitigation measures related to environmental¹, social and economic resources.

3.3 Local Regulations

3.3.1 Wind Energy Conversion System Permit

The Albany County Wind Energy Siting Regulations require all facilities with an aggregate generating capacity greater than 25 kilowatts (kW) apply for a Wind Energy Conversion System (WECS) Use Permit (Albany County 2017). The application process involves the review and recommendation of the Planning and Zoning Commission and the approval of the Board of County Commissioners, as well as community input during a defined and requisite public hearing and comment period (§§18-5-502(a)). The WECS Use Permit applicants must certify that the Project would comply with all applicable state and county zoning and land use regulations. As part of the application, potential impacts to resources such as economic, air quality, water quality, general nuisances, soil disturbance, wildlife, and cultural resources must be addressed.

The Albany County Wind Energy Siting Regulations has the following provisions for visual impacts (Albany County 2011 [Amended 2017], Chapter V, Section 8G):

2. *Color. Towers and blades shall be painted white or gray or another non-reflective, unobtrusive color as agreed to by the County Planner and the*

¹ According to the ISC Chapter 1 (Industrial Development Information and Siting Rules and Regulations) Section 2 (k), the definition of "Environment" means the physical conditions existing within an affected area, including aesthetic impacts over which the Industrial Siting Council has jurisdiction.

applicant that will help the project blend with the natural visual character of the area.

7. *Setbacks*

- j. *Setback distances may be modified at the discretion of the Board of County Commissioners to minimize degradation, if any, of the visual, environmental or acoustic character of the area, additional performance standards may be adopted by the Board of County Commissioners upon formal consideration, review and public hearings.*

4 METHODOLOGY

Although federal and state regulations require evaluation of potential project impacts to environmental resources, including visual resources, there is no specific direction for assessment of impacts of such resources. Since federal and state methodology and guidelines were not available, a standard inventory and assessment approach that applied certain elements of the BLM VRM system was used for this VIA. The inventory and assessment approach used for this VIA was supported through coordination with WAPA. The BLM VRM system is widely used for a variety of projects and, with some modifications, has been applied successfully to projects that do not occur on lands under the jurisdiction of the BLM.

Key steps in the methodology include establishing a study area, inventorying visual resources in the study area, identifying sensitive viewing locations and key observation points (KOPs)², conducting field work to assess the existing visual character of the landscape and to inventory KOPs, creating visual simulations, and assessing impacts and potential mitigation measures.

4.1 Analysis Area

The visual study area was identified based on locations from which the tallest Project components (i.e., wind turbines) would potentially be visible and noticeable to the casual observer. The “casual observer” is considered to be an observer who is not actively looking or searching for the Project facilities but is engaged in activities at locations with potential views of the Project, such as hiking, hunting, or driving on a scenic road. The proposed visual study area for the Project was discussed with and accepted by WAPA prior to commencing the visual inventory and assessment. The following section describes how the visual study area was identified.

4.1.1 Visual Study Area

Visual assessments conducted for proposed wind farms in Wyoming have applied study areas that range from approximately 20 to 30 miles, depending on the size of the proposed wind turbine, the wind turbine layout, and the surrounding landscape. A study prepared for the BLM in 2013 found that wind facilities (wind farms with wind turbine heights ranging from approximately 300 to 400 ft) “would be unlikely to be missed by casual observers at distances of up to 20 miles, and that the facilities could be major sources of visual contrast at distances of up to 10 miles” (Sullivan

² Key observation points are discussed in Section 4.2.2.

et al. 2013). The findings of this study were based on observations of operational wind farms in Wyoming with wind turbines that were smaller in height than those proposed for the Project. Based on the BLM study and precedence set by other wind energy facilities in Wyoming, a visual study area of 30 miles was used for this VIA.

4.1.2 Viewshed Analysis

Existing views from various locations in the vicinity of the Project would be altered to varying degrees as a result of the construction of Project facilities. To investigate the potential visual impacts of the Project, a viewshed analysis was conducted to determine the extent to which Project facilities would potentially be visible within the 30-mile visual study area. The wind turbines were used for the viewshed analysis because they are the tallest Project component and therefore the biggest source of contrast introduced into the landscape. Two viewshed analyses were conducted to determine the locations from which wind turbines would be potentially visible: one using the wind turbine specifications and layout associated with the minimum turbine height scenario (GE 3.0 MW; Figure 3) and one using the wind turbine specifications and layout associated with the maximum turbine height scenario (Vestas 5.6 MW; Figure 4). Parameters used for each turbine scenario are discussed in Section 2.

An assumed viewer height of 6 ft was used for both analyses. The topographic viewshed analyses assumed “bare-earth” conditions and were conducted using Environmental Systems Research Institute ArcGIS Geographic Information System (GIS) Pro 2.2.0 software with the Spatial Analyst extension to process 10 m Digital Elevation Models (DEM) of the terrain within the visual study area. The ArcGIS software was used to analyze line-of-sight from the three-dimensional coordinates of the wind turbines to points on the terrain surface, thereby identifying locations from which the Project would potentially be visible. The viewsheds accounted for both curvature of the earth and refraction, using the default values identified in the software. The bare-earth modeling approach used in the viewshed analyses, based only on the effects of terrain on visibility, results in a conservative assessment of potential visibility. A bare-earth analysis does not take into account the visibility effects of vegetation or buildings, which may screen or block certain views.

4.2 Resource Inventory Components

The inventory for visual resources considered the existing landscape and scenery and the scenic resources within the visual study area. These visual components are described below.

4.2.1 Existing Landscape Character and Scenic Quality

Scenery is the aggregate of features that give character to the landscape (BLM 1984). Typically, every landscape comprises varying levels of the following key characteristics; all of which combine to exhibit landscape character (BLM 1986a):

- Landforms—Landscapes with larger, steeper, or highly eroded landforms are more scenic than flat landscapes.

- Vegetation—The greater the diversity of plant species and forms, the more scenic the landscape becomes.
- Water—Landscapes with dominant water features that add movement or serenity are generally more scenic.
- Color—Landscapes with pleasing color combinations, vivid colors, or many different colors are more scenic than areas with subtle color variations and muted tones.
- Adjacent scenery—Areas with foreground and middleground views towards unique and scenic landscapes are generally more scenic.
- Scarcity—One-of-a-kind landscapes are more scenic than those that are common within the physiographic region.
- Cultural modifications—These may either detract from or improve the scenic quality of a landscape.

These key characteristics are specifically considered when measuring the scenic quality of the landscape. Within the inventory portion of the BLM VRM system, landscapes are rated as A (high), B (medium), or C (low) based on their apparent scenic quality. Section 4.3.1 describes how scenic quality within the visual study area was determined. Section 5.1 describes the landscape within the visual study area.

4.2.2 Sensitive Viewers/ Key Observation Points

The term “sensitive viewers” refers to specific user groups associated with various land uses that have a sensitivity to landscape change, and therefore could be adversely affected by the construction and operation of the Project. In this regard, viewing locations are typically associated with key travel routes, recreational areas, and residential areas. KOPs represent critical viewpoints where there is public sensitivity to visual change due to the type of user, level of use, or orientation to a proposed project, and can include points along a travel route or at an identified viewing location (BLM 2020c). KOPs are used to assess the visual effect of a proposed project. The sensitivity of viewers at each KOP is based on the type of use and expected concern for aesthetics. Identifying groups of individuals that would likely be sensitive to visual changes is part of the visual assessment process and helps to define specific locations from which to assess changes to the visual character of the landscape. The inventory considered: (1) the most critical viewpoints (i.e., views from communities, residential areas, and recreational areas); (2) views from scenic areas specifically identified in local planning documents; and (3) views that best represent the general area or landscape setting.

Data sources reviewed to identify scenic resources were obtained through aerial imagery (USDA’s National Agriculture Imagery Program [NAIP] or Esri World Imagery) for identification of sensitive landscape features such as residences and other structures; national, state, and local agency websites and local planning and zoning documents; and Google Earth. Locations identified for field verification within the viewsheds created for the Project are referred to as representative viewpoints. These representative viewpoints were reviewed during the field visits

(see Section 4.2.3) to determine expected visibility of the Project and assess potential visual impacts.

Based on the results of the field visits (4.2.3) and coordination with WAPA, a total of 13 KOPs within the visual study area (Figure 6) were selected for detailed study (Section 6.1.2.5). Criteria used to select KOPs included:

- Locations representing the most critical viewpoints (i.e., views from communities, residential areas, or recreational areas, scenic areas specifically identified through agency consultation, and during public scoping meetings)
- Geographic distribution representing locations at various distances within the visual study area

Should additional KOPs be identified at a later date through coordination with WAPA or other agencies/stakeholders, an addendum to the VIA will be developed outlining the results and analysis of these additional KOP locations.

4.2.3 Field Reconnaissance

Field visits to the visual study area were conducted to properly assess the existing visual character of the landscape and to inventory scenic resources. The field inventory included three components: (1) identify and photo-document scenic resources/representative viewpoints; (2) classify visual sensitivity of scenic resources; and (3) describe Project visibility from representative viewpoint locations visited. An initial field visit was conducted on September 25 and 26, 2019, to capture photography from representative viewpoints. Additional field visits were conducted on November 22 and December 6, 2019, to complete the visual resource inventory by visiting and photo-documenting locations identified through agency coordination. Following the field inventory, a subset of the representative viewpoints was selected as representative KOPs for use in the impact evaluation, discussed in Section 4.3.

At each representative viewpoint, a panorama (overlapping series of photos) was captured at each location visited in the field. Photographs were captured using a digital single lens reflex (dSLR) camera. The camera was equipped with a fixed lens with a 35 millimeter (mm) equivalent focal length of 53.55 mm to maintain a consistent field of view across photographs captured. This camera and lens combination most closely approximates the field of vision of the human eye. With this approach, the size and scale of objects in the background and foreground are depicted proportionately and are not distorted. A submeter GPS receiver was used to record the latitude, longitude, elevation, date, and time of each photo point location.

Table A-1 in Appendix A provides the locational details for photographs taken during the field visit and description of the existing views for locations initially identified as potentially sensitive within the visual study area. Photographs taken during the field visits are included in Appendix A.

4.3 Determining Impacts of the Project

4.3.1 Assess Existing Visual Resources / Scenic Quality

The BLM has conducted visual resource inventories in southern Wyoming and northern Colorado and identified landscape unit visual quality classes for lands. The majority of lands (both BLM-administered and non-BLM administered lands) within the visual study area were previously inventoried as part of the BLM VRM analysis process (BLM 2020a). The existing BLM mapping of visual quality was reviewed and used, as applicable, for documenting existing conditions within the visual study area (Figure 5). As noted in Section 4.2.1 landscapes are rated as A (high), B (medium), or C (low) based on their apparent scenic quality. Table 2 is a summary of the landscape class rating definitions based on the BLM VRM system.

Table 2: Landscape Class Rating Based on BLM VRM System

Class	Description
Class A (Distinctive)	Outstanding areas where characteristic features of landform, rockform, water, and vegetation are distinctive or unique in the context of the surrounding areas. These features exhibit considerable variety in form, line, color, and texture and have strong positive attributes of unity and intactness. A score of 19 points or more, as tallied on an individual field inventory sheet, resulted in a distinctive rating.
Class B (Average or Common)	Average or common areas in which features provide variety in form, line, color, and texture. And although the landscape elements may not be rare in the region, they provide sufficient visual diversity to be considered moderately interesting. These features exhibit more common variety in form, line, color, texture, and have positive, yet more common attributes of unity and intactness. The score of 12 to 18 points, as tallied from an individual field inventory sheet, resulted in an Average or Common rating.
Class C (Minimal or Indistinctive)	Minimal or Indistinctive areas are those where characteristic features have little variety in form, line, color, or texture in relation to the surrounding region. The score of 11 points or less, as tallied from an individual field inventory sheet, resulted in a Minimal or Indistinctive rating.

Source: BLM (1986a)

Scenic quality within the visual study area consists of lands primarily rated Class B and C with limited portions rated Class A (Figure 5). Class C landscapes include flat open grasslands associated with the valley between mountain ranges and is bisected by branches of the Laramie River. Class B rated landscapes include the rolling to steep, varied terrain associated with the Laramie Mountain Range and branches of the Laramie River and adjacent lands that consist of primarily of agricultural fields. Class A landscapes are limited to the steep, varied forest covered terrain associated with portions of the Laramie and Roosevelt Mountains (Figure 5).

Areas within the visual study area that were not inventoried as part of the BLM VRM inventory process include the city of Laramie and lands within Medicine Bow-Route National Forest under the jurisdiction of the U.S. Forest Service (USFS), including the Pole Mountain Area and portions of the Laramie and Roosevelt Mountains (Figure 5). The Pole Mountain Area is located just north of Interstate 80 approximately 2 miles northeast of the Project Area. The Laramie and Roosevelt Mountains are located in the southwestern and western portion of the visual study area. USFS lands are inventoried under their own system for analyzing and managing scenery called the Scenery Management System (SMS). The USFS's SMS process for inventorying landscape character, which is the equivalent to BLM's scenic quality, is similar to the BLM VRM system in

that the SMS process looks at landscape character (i.e., landform, vegetation patterns, water characteristics, and cultural features) and assigns scenic attractiveness classes expressed as Class A (distinctive), Class B (typical), and Class C (indistinctive).

Tetra Tech contacted staff at Medicine Bow-Routt National Forest to obtain SMS for USFS-administered lands within the visual study area and received SMS data for USFS lands within the Pole Mountain Area as well as the Wyoming portion of the Laramie and Roosevelt Mountains within the visual study area (Gonzales 2020; Figure 5). While no SMS data are available for the Colorado portion of the Laramie and Roosevelt Mountains within the visual study area (Figure 5) it is anticipated that scenic quality associated with these USFS lands would be rated conservatively as either Class A or Class B landscapes. This assumption is based on the varied terrain, rock outcroppings, dense vegetation, and water features that compose the majority of USFS lands within the visual study area and the scenic attractiveness classes of adjacent USFS lands that exhibit similar landscape characteristics. It should be noted that based on the results of the bare-earth viewshed analyses for both the minimum and maximum turbine height scenarios (Figure 3 and Figure 4), there is minimal visibility of the Project from within these un-inventoried USFS-administered lands, and no KOPs are located within this area (Figure 5).

4.3.2 Predicting Viewer Response

Viewer response to a change in visual quality is primarily based on the concept of visual sensitivity. The BLM VRM systems define visual sensitivity as a measure of viewer concern for the scenic resource and potential changes to the resource (BLM 1984). Those areas with greater public concern for the quality of visual resources are more sensitive to changes to visual resources. The sensitivity level for a given KOP can be classified as high, moderate, or low. A variety of factors can influence the level of viewer sensitivity and include the following (BLM 1986a):

- Type of Users—Visual sensitivity will vary with the type of users. Recreational sightseers may be highly sensitive to any changes in visual quality, whereas workers who pass through the area on a regular basis may not be as sensitive to change.
- Amount of Use—Areas seen and used by large numbers of people are potentially more sensitive. Protection of visual values usually becomes more important as the number of viewers increase.
- Public Interest—The visual quality of an area may be of concern to local, State, or National groups. Indicators of this concern are usually expressed in public meetings, letters, newspaper or magazine articles, newsletters, land-use plans, etc. Public controversy created in response to proposed activities that would change the landscape character should also be considered.
- Adjacent Land Uses—The interrelationship with land uses in adjacent lands can affect the visual sensitivity of an area. For example, an area within the viewshed of a residential area may be very sensitive, whereas an area surrounded by commercially developed lands may not be visually sensitive.

- **Special Areas**—Management objectives for special areas such as Natural Areas, Wilderness Areas or Wilderness Study Areas, Wild and Scenic Rivers, Scenic Areas, Scenic Roads or Trails, and Areas of Environmental Concern, frequently require special consideration for the protection of the visual values. This does not necessarily mean that these areas are scenic, but rather that one of the management objectives may be to preserve the natural landscape setting. The management objectives for these areas may be used as a basis for assigning sensitivity levels.
- **Other Factors**—Consider any other information such as research or studies that includes indicators of visual sensitivity.

For clarity, assessment of viewer response to the change in visual quality attributed to the Project incorporates separate and specific consideration of viewer sensitivity and viewer numbers. In this context, viewer sensitivity reflects the types of users, identifiable level of public interest, adjacent land uses, special areas, and other factors as described in the list above. Consideration of viewer numbers corresponds to the amount of use associated with a KOP and is a factor in evaluating the intensity of an impact.

4.3.3 Photographic Simulations

Photographic simulations (simulations) were created to depict the proposed wind turbines (both minimum and maximum turbine height scenarios) and their potential changes to the existing landscape. Photographic simulations did not include other Project components (i.e., overhead collection, transmission, meteorological towers, O&M facility) because the scale and spatial dominance³ of these features introduce weak contrast relative to the wind turbines. The simulations were used to determine the level of contrast between the existing landscape and the expected landscape after the Project is implemented. Of the 13 KOP locations selected for the analysis (see Section 4.2.2 and Section 5.3), seven representative KOPs, primarily those representing locations with high viewer sensitivity and high potential for visual impacts to existing visual resources, were selected for development of simulations to demonstrate how the constructed Project would appear to future viewers (Figure 6). Should additional photographic simulations be identified at a later date through coordination with WAPA or other agencies/stakeholders, an addendum to the VIA will be developed outlining the results of the simulation(s) and any associated analyses.

Two simulation sets were created for each selected KOP within the visual study area, one depicting the proposed minimum turbine height scenario and one depicting the proposed maximum turbine height scenario. Nighttime simulations for both scenarios were also completed for KOP 2 (The Buttes) and KOP 11 (Snowy Range Road/ Big Hollow Road; Figure 6). Simulations depict actual weather conditions at the time photography was taken during the field visits (see Section 4.2.3).

³ Spatial dominance is the scale of an object relative to the visible expanse of the landscape that forms its setting. From certain vantage points, the Project will be a subordinate feature in the context of the expansive valley setting.

The simulations were created using Esri's ArcMap geographic information system (GIS) software, Autodesk 3D Studio Max®, and rendering and Photoshop software. To create the simulations, the location data captured by the GPS device were transferred to ArcMap, where it was combined with GIS data of the preliminary layouts of Project components and facilities. The data were exported at true scale and imported into 3D Studio Max®. Using this scaled data as a base, 3D models of the Project Area were created to scale. These 3D models of the Project features, previously modeled to scale in 3D Studio Max®, were added in their appropriate locations and elevations. The views from the existing digital photographs were then matched in the 3D model using virtual cameras with the same focal length and field of view as the dSLR camera setting. After date- and time-specific lighting was added to the 3D model, renderings from the virtual cameras were created. These renderings were then blended into the existing conditions photographs in Adobe Photoshop software. Any necessary modifications to the existing landscape (such as removal of trees) were completed in Photoshop as well. This process of creating a 3D model at true scale and rendering images using the same specifications used by the camera ensures that the spatial relationships of the landscape, Project features, and viewer perspective are accurate and match the existing site photographs. Each simulation was then scaled to be viewed at a specified distance to represent the actual size of the turbines. The simulations for all seven representative KOP locations are provided in Appendix B.

4.3.4 Visual Impact Assessment

Public enjoyment of a scenic resource is subjective and highly dependent on the viewer's perception of beauty and scenery. The addition of the Project into a view may be detrimental to one viewer's enjoyment of a location but may have a negligible effect or a positive effect for a different viewer. Therefore, a process using the concept of "contrast" based on the BLM VRM system is often used to objectively measure potential changes to landscape features of inventoried sensitive resources (BLM 1986b; BLM 1984). Concepts from the BLM VRM system are widely used for assessment of a variety of projects and, with some modifications, have been applied successfully to projects that do not occur on lands under the jurisdiction of the BLM. In the BLM VRM system, potential visual effects are assessed by considering the level of contrast a proposed facility introduces to the existing landscape. The BLM's visual contrast rating process (Handbook 8431-1 Visual Resource Contrast Rating; [BLM 1986b]) was used as the basis for reviewing potential landscape changes resulting from the Project and is discussed below.

Visual Contrast Rating

Assessing the degree of visual contrast is a means to evaluate the level of modification to the existing landscape features that would result from an action. In the context of the Project, existing landscape scenery is defined by the visual characteristics (form, line, color, and texture) associated with the landform (including water), vegetation, and existing facilities within and adjacent to the Project. Descriptions of each visual character element are listed below:

- Form—The shape and mass of landforms or structures
- Line—The edge of shapes or masses, silhouettes, or bands

- Color—The property of reflecting light of a particular intensity of wavelength that the eye can see
- Texture—The nature of the surface of landforms, vegetation, or structures

The level of visual contrast introduced by an action can be measured by changes in form, line, color, and texture. The greater the difference between these character elements found within the landscape and the Project components, the level of visual contrast becomes more apparent, which typically increases perceived contrast.

The degree of contrast introduced to a particular viewpoint by Project facilities, in combination with the sensitivity of viewers at that viewpoint, would determine the level of visual effect. The following general criteria are used by the BLM when rating the degree of contrast, and they are utilized here to describe the visibility/noticeability of the Project components:

- None—The element contrast is not visible or perceived
- Weak—The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
- Moderate—The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
- Strong—The element contrast demands attention, will not be overlooked, and is dominant feature in the landscape (BLM 1986b).

Contrast ratings were prepared for each of the KOPs using a form adapted from the BLM's Visual Contrast Rating Worksheet (Form 8400-4), and are included in Appendix C. Table 5 in Section 6.1.2.4 provides a summary of the level of contrast (i.e., strong, moderate, weak, none) for each KOP within the visual study area.

Distance Zones

Viewer distance from an area is a key factor in determining the level of visual effect, with perceived impact generally diminishing as distance between the viewer and the affected area increases (BLM 1986a). As part of the contrast rating process, landscapes are subdivided into distance zones based on relative visibility from sensitive viewers. Three distance zones were defined for this assessment and are consistent with established protocols of the BLM VRM methodology. The BLM VRM categorizes views into foreground/middleground, background, and seldom seen distance zones. These distance zones provide a frame of reference for classifying the degree to which details of the viewed Project would affect visual resources. The three distance zones are defined as follows:

- **Foreground/Midleground (0 to 5 miles).** This distance zone is considered to be the range from which Project element details would be visually clear (in the foreground) and where viewers still have the potential to distinguish individual forms, and texture and color are still identifiable but become muted and less detailed (midleground).
- **Background (5 to 15 miles).** Within this distance zone texture has disappeared and color has flattened, making objects appear “washed out;” however, landform ridgelines are still distinguishable.
- **Seldom Seen (15 miles or more).** This distance zone includes lands visible beyond 15 miles or lands hidden from view from key locations.

Other Environmental Factors

Other environmental factors that can influence the amount of visual contrast introduced by the components of a project include (BLM 1986b):

- **Angle of Observation.** The angle between the viewer’s line-of-sight and a project’s location. Angles of observation are typically described as inferior (in which viewers are situated at a lower elevation than the proposed project), level (as described above), and superior (in which viewers are situated at a higher elevation than the proposed project). Angle of observation influences the perception of visual contrast. Viewers at higher elevations (superior views) tend to see larger portions of a project.
- **Available Panorama.** The more of the available view the proposed facilities are visible in, the greater the amount of visual contrast
- **Length of Time the Facility is in View.** If the viewer has only a brief glimpse of the project, the contrast may not be of great concern. If, however, the project is subject to view for a long period, as from an overlook, the contrast may be very significant.
- **Relative Size or Scale.** The level of visual contrast created by a project is directly related to its size and scale compared to the surrounding landscape in which it is located.
- **Season of Use.** The physical conditions that exist during the heaviest or most critical visitor use season, such as snow cover and tree defoliation during the winter, leaf color in the fall, and lush vegetation and flowering in the spring.
- **Lighting Conditions.** The direction and angle of the sun affects the color, intensity, shadow, reflection, form, and texture of visual aspects of proposed project components.
- **Atmospheric Conditions.** The visibility of projects due to atmospheric conditions such as air pollution, natural haze, fog, and precipitation, which could affect the visibility of an object.

5 EXISTING ENVIRONMENT

The following sections describe the existing environment in the visual study area. Existing conditions were evaluated by means of aerial photography and field reconnaissance to determine where modifications have affected natural settings.

5.1 Existing Landscape Character/Existing Conditions

The existing landscape character provides the context for assessing the effects of changes to the landscape. Landscape character is identified and described by the combination of the scenic attributes that make each landscape identifiable or unique. A region's landscape character creates a sense of place and describes the visual image of an area. To assess impacts to the landscape's visual character and quality, it is important to establish the context for the visual environment at both a regional level and at a project-specific level.

5.1.1 Regional Landscape Character

U.S. Environmental Protection Agency Level IV ecoregions of Wyoming and Colorado were used to develop a description of the existing landscape character within the visual study area (Chapman et al. 2004; 2006). Ecoregions are defined based on multiple elements similar to those used in the BLM's VRM for inventorying and assessing scenic quality (BLM 1986a). These factors include physiographic elements of landform, vegetation, and water, and cultural modifications, defined as human/man-made modifications to the landscape. The visual study area encompasses the Laramie Basin division of the Wyoming Basin Ecoregion; the Mid-Elevation Forests and Shrublands, Foothill Shrublands, and Subalpine Forests divisions of the Southern Rockies Ecoregion; and Moderate Relief Plains and Front Range Fans divisions of the High Plains Ecoregion. Landscape conditions within these Level IV ecoregions are discussed below.

Wyoming Basin—Laramie Basin

The Laramie Basin division of the Wyoming Basin Ecoregion is characterized as a wide, gently sloping intermontane valley between 7,100 and 7,900 ft in elevation, with nearly flat floodplains and low terraces. Gently sloping streams, including the Laramie River and the Little Laramie River, meander from the south to north through the valley along cottonwood-lined river channels, collecting at several small reservoirs that dot the valley floor. The dominant vegetation in the region is mixed-grass prairie and rabbitbrush, and rangeland and seasonal livestock grazing is the primary land use (Chapman et al. 2004).

This ecoregion encompasses the northwest portion of the visual study area.

Southern Rockies—Mid-Elevation Forests and Shrublands

Surrounding the Laramie Basin is the Crystalline Mid-Elevation Forests division of the Southern Rockies Ecoregion, which is characterized by low mountain ridges and rugged hills at elevations between 7,500 and 9,000 ft. Outwash fans created by the moderate to high gradient perennial streams can also be found at the toe of the ridge slopes. Forests within this ecoregion contain a

dense mix of aspen, lodgepole pine, Douglas fir, and ponderosa pine. Wildlife habitat, livestock grazing, logging, recreation, and mineral extraction are common land uses within this ecoregion (Chapman et al. 2004).

This ecoregion encompasses the central and extends into the southwest portion of the visual study area.

Southern Rockies—Foothill Shrublands

The Foothills Shrublands division of the Southern Rockies ecoregion is a transition from higher elevation forests to more arid grasslands and is characterized by rolling to irregular terrain such as hills, ridges, and footslopes at elevations between 5,000 and 7,500 ft. Water courses, including perennial, intermittent, and ephemeral streams, originate at higher mountain ranges and meander to the surrounding valleys can also be found within this ecoregion. The dominant vegetation in the region includes high plains prairie grasslands interspersed with big mountain sagebrush and mountain mahogany shrubland with pockets of aspen, limber pine, and Douglas-fir on north-facing slopes. Livestock grazing, rangeland, and wildlife habitat are the primary land uses within this ecoregion (Chapman et al. 2004).

This ecoregion encompasses central portion of the visual study area and is adjacent to the Mid-Elevation Forests and Shrublands ecoregion.

Southern Rockies—Subalpine Forests

The Subalpine Forests division of the Southern Rockies encompasses a narrow elevational band on the steep forest slopes of mountains at elevations between 8,000 and 12,000 ft and is characterized by steep, rugged terrain. The dense forests are dominated by Englemann spruce and subalpine fir. Recreation, logging, mining, and wildlife habitat are the major land uses (Chapman et al. 2006).

This ecoregion encompasses a small area within the southwest portion of the visual study area in Colorado.

High Plains—Moderate Relief

The Moderate Relief division of the High Plains ecoregion is characterized by irregular plains with moderate slopes at elevations between 4,700 to 7,600 ft. Water courses, including intermittent and perennial streams, originate at higher mountain ranges and traverse this ecoregion. The dominant vegetation in this ecoregion is mixed-grass prairie dominated by blue gamma, western wheatgrass, bluegrass, rabbitbrush, and various forbs, shrubs and other grasses. Patches of mountain mahogany and skunkbush sumac grow on bluffs and hilltops. Land use common in this ecoregion includes primarily rangeland, livestock grazing and wildlife habitat (Chapman et al. 2004).

This ecoregion encompasses the eastern portion of the visual study area.

High Plains—Front Range Fans

The Front Range Fans division of the High Plains ecoregion borders the northern Front Range of the Southern Rockies in Colorado, and is characterized by fans, irregular plains, and scattered low hills and are found at elevations between 4,800 and 5,300 ft. Water courses include intermittent and perennial streams that traverse this ecoregion. The dominant vegetation is mixed-grass prairie and shortgrass with cottonwoods, shrubs and herbaceous species found along riparian areas. Land use includes urban and residential and some irrigated cropland (Chapman et al. 2006).

This ecoregion encompasses a small area within the southeast portion of the visual study area in Colorado.

5.1.2 Project Area

The Project Area is located approximately 18 miles south of Laramie, Wyoming, and is generally situated between the Pole Mountain Area, which is located approximately 2 miles to the northeast and the Laramie Mountains which are located directly south-southwest of the Project Area. The Project Area encompasses approximately 26,000 acres of rangeland on private and state lands and is bisected by U.S. Highway 287. The topographic character of the Project Area is gently to moderately rolling to irregular terrain that is dissected by drainageways and associated tributaries, including Fish Creek, Boulder Creek and Willow Creek in the southern portion of the Project Area, and Dale Creek in the northeastern portion of the Project Area. Some of the creeks have been dammed, thereby creating small reservoirs throughout the area. The terrain in the northeast portion of the Project (north of U.S. Highway 287) is more heavily bisected by tributaries associated with Dale Creek. The slopes of these tributaries appear steeper and create a more undulating and hilly landscape. In addition, scattered rock outcroppings are apparent in this portion of the Project Area. Most of the Project Area consists of rangeland that is covered in grasslands and dwarf sagebrush shrublands that appear in varying hues of light green, brown, and yellow in the spring and summer. In the fall and winter, when not covered by snow, these grasses turn a dull grayish yellow color. In low-lying areas around perennial streams, the grasses appear to be a much darker hue of green. Large deciduous trees also dot the landscape along the streams and provide a contrast to the low grasses. In addition, limber pine-juniper woodland is scattered across the Project Area, but focused primarily within the very southern portions. The Project Area is primarily used as rangeland for livestock grazing. Human-made modifications are limited within the Project Area to paved and unpaved roads, rural residential structures, structures associated with ranching and grazing activities (such as sheds and fences), the Union Pacific Railroad that crosses the eastern portion of the Project Area, and the high-voltage WAPA transmission lines that cross the southern portion of the Project Area. Interstate 80 is located approximately 1.5 miles to the northeast. In addition, there are several communication towers located within and adjacent to the Project Area that are visible both day and night due to the FAA lighting on the towers.

5.2 Viewing Areas and Viewer Groups

This section provides a general description of the key viewer groups in the visual study area that might experience the visual effects of the Project. Distinctions among user groups and their expected sensitivity to landscape changes, based on activity types and viewing characteristics, are standard components of visual impact assessment.

Viewer concern can vary depending on the characteristics and preferences of the viewer group. For example, residential viewers are expected to have high concern for changes in views from their residences. Motorists' concern generally depends on when and where travel occurs and the type of travel involved (e.g., commuting vs. recreational travel). The duration of view (the estimated length of time of the view from a viewer to a proposed project or project feature) is a key consideration in assessing the sensitivity of various types of viewers.

Scenic views designated in land use plans adopted by federal, state, or local government entities typically formalize a widely recognized visual value of a resource and the public's desire to protect that value (e.g., a designated wilderness or scenic area). Where such official designated lands exist, the public expectation is that the view at the location or of the identified resource would be preserved, and the viewer concern is considered high.

For this analysis, sensitive viewing areas and viewer groups have been identified and grouped into the following categories: local residences, travelers, and tourists and recreational users. These categories are described in the following sections.

5.2.1 Local Residences

The local residential viewer groups consist of people who live and work within the visual study area. Local residents are present on a year-round basis. Generally, they view the landscape from their properties and homes, and often from places of employment while engaged in daily activities. Residents include rural residences located around the perimeter of the Project Area (typically within approximately 3 miles); the small community of approximately 20 to 25 residences within The Buttes, located 5 miles north of the Project; and residences within and around the city of Laramie, located approximately 18 miles north of the Project.

Regardless of their residence or work location, local residents may have similar reactions to views of the Project. Residents' sensitivity to visual quality can be variable and may be tempered by the visual character and setting of their neighborhoods. For example, residents with a view of existing commercial or industrial facilities may be less sensitive to landscape changes than those with a view of open farmland or forested areas. It is assumed, however, that local residents are generally familiar with the local landscape and may be more sensitive to changes in particular views that are important to them.

5.2.2 Travelers

Travelers passing through an area typically view the landscape from motor vehicles on their way to work or other destinations. Travelers include daily commuters and people engaged in business or personal travel.

Commuters traveling within the visual study area view the landscape from motor vehicles on their way to work or other business destinations. This viewer group is likely to be relatively small because of the small population and limited employment centers within the analysis area. Commuting activity is likely concentrated around larger communities in the visual study area, including Laramie and Cheyenne, Wyoming. Commuters do not tend to stop along their travel routes, have a relatively narrow field of view because they are focused on road and traffic conditions, and are destination-oriented. Passengers in commuter vehicles would have greater opportunities for prolonged off-road views toward landscape features and, accordingly, may have greater perception of changes in the visual environment.

Through travelers are typically moving, have a relatively narrow field of view, and are destination-oriented. They would be concentrated on the major roads that traverse the visual study area, including Interstate 80, U.S. Highways 287 and 30, and Wyoming Highways 130 and 230. Generally, drivers in this group are focused on driving and on the road and traffic conditions but have the opportunity to observe roadside scenery from time to time. Both drivers and passengers may have greater opportunities for prolonged views toward landscape features and may take more notice of changes in the visual environment.

5.2.3 Tourists and Recreational Users

This viewer group includes local and seasonal residents engaged in recreational activities, and tourists and recreational users visiting from out of the local area. These users can be involved in outdoor recreational activities at parks and other developed recreational facilities or in undeveloped natural settings such as forests, fields, and water bodies. Tourists and recreational users come to the area for the purpose of experiencing its cultural, scenic, and/or recreational resources. Some, such as weekend and seasonal homeowners, may spend additional time in the area. They may view the landscape while traveling to these destinations on local roads, or from the sites themselves.

The recreational user group includes those involved in active recreation (e.g., bicyclists, hikers, joggers, hunters) and those involved in more passive recreational activities (e.g., picnicking, sightseeing, wildlife observation or walking). For some of these viewers, scenery is a very important part of their recreational experience, and recreational users often have continuous views of landscape features over relatively long periods of time. However, most recreational viewers would only view the surrounding landscape from ground-level vantage points. Recreational users' sensitivity to visual quality and landscape character would be variable, depending on their reason for visiting the area. For example, an off-highway vehicle (OHV) recreation user is considered less sensitive to visual change than a wildlife viewer or a recreator

looking for a cultural experience. However, recreators are generally considered to have relatively high sensitivity to scenic quality and landscape character.

Within the visual study area, likely locations for this group would include the Roosevelt and Medicine Bow National Forests (including Vedauwoo Recreation Area), Curt Gowdy State Park, Hutton Lake and Mortenson Lake National Wildlife Refuges, and historic sites such as Ames Monument and Virginia Dale historical marker. Within the Project Area, the Wyoming Game and Fish Department (WGFD) administers and manages the Cherokee Park Hunter Management Area (HMA), located within the southern portion of the Project Area, and South Platte River Area 2 Walk-In Fishing Area (WIFA), located within the southeastern portion of the Project Area. The Cherokee Park HMA primarily supports elk hunting and is comprised of 3,166 acres of both private and state lands. The South Platte River Area 2 WIFA is located within state lands along Johnson Creek and is identified as an area for brook trout fishing. In addition, the WGFD administers and manages several public access areas (PAAs) in the visual study area, which allow the public to access small bodies of water, such as small lakes and rivers. These areas are used for a variety of outdoor recreation activities, including fishing, waterfowl hunting, boating, and camping and include Lake Hattie Reservoir, Twin Buttes Lake, Gelatt Lake, and Meeboer Lake, all located approximately 16 miles northwest of the Project Area, and Alsop Lake, located approximately 24 miles northwest of the Project Area (WGFD 2020).

As distinguished from recreational visitors, tourists may be just passing through the local area or staying for a period of varying duration to enjoy local attractions. Tourists typically come to the area for activities such as visiting historic or geologic sites, taking sightseeing tours, visiting friends and family, and attending festivals or events, but they may also engage in recreational activities while they are present. Consequently, there is a considerable degree of overlap among recreational and tourist visitors in terms of activity patterns and user characteristics.

Tourists' activity would likely be concentrated on and near the major travel routes or major developed areas such as Laramie or Cheyenne, as identified above.

5.3 Representative Viewpoints

Based on the results of the field visits (see Section 4.2.3), a total of 13 KOPs within the visual study area were selected for detailed study (Figure 6). Criteria used to select KOPs included:

- Locations representing the most critical viewpoints (i.e., views from communities, residential areas, or recreational areas, scenic areas specifically identified in planning documents)
- Geographic distribution representing locations at various distances within the visual study area

Table 3 identifies the locations and summarizes key attributes for the KOPs. KOPs identified were the same for both the minimum and maximum turbine height scenario layouts.

Table 3: List of Key Observation Points within the Visual Study Area

KOP No. ¹	Name	KOP Category/ Viewer Group	Distance Zone ²	Distance to Project Area Boundary (miles)
1	Tie Siding	Residential Travel Route	Foreground/ Middleground	0
2	The Buttes	Residential Travel Route	Background	5.4
3	Ames Monument	Historic Site Residential	Foreground/ Middleground	0.4
4	Cherokee Park Road and Fish Creek Road	Residential Travel Route	Foreground/ Middleground	0.8
5	Virginia Dale Monument	Historic Site Travel Route	Background	6.3
6	Laramie / City Ranch Road	Residential	Background	11
7	Mortenson Lake National Wildlife Refuge	Recreation Travel Route	Background	14
8	Medicine Bow–Routt National Forest	Recreation	Foreground/ Middleground	2.5
9	Interstate 80	Travel Route	Foreground/ Middleground	4.5
10	Arapaho and Roosevelt National Forest/ Prairie Divide Road	Residential Recreation	Background	9.1
11	Snowy Range Road / Big Hollow Road	Travel Route	Seldom Seen	22
12	US 30 - Willow Trail	Travel Route	Seldom Seen	20
13	Bath Brothers Ranch / Herrick Road	Historic Site	Seldom Seen	25

1 KOP numbers also correspond to the Map ID numbers included on the map shown in Figure 6.

2 Distance zones are defined in Section 4.3.4

Table 4 includes the locations identified for photographic simulations and notes the daytime and nighttime simulations created for each. Photographic simulations of these KOPs are included in Appendix B.

Table 4: Photographic Simulation Locations

KOP No. ¹	Name	Location	Simulations	
			Daytime	Nighttime ²
1	Tie Siding	Albany County, WY	X	
2	The Buttes	Albany County, WY	X	X
3	Ames Monument	Albany County, WY	X	
4	Cherokee Park Road and Fish Creek Road	Albany County, WY	X	
7	Mortenson Lake National Wildlife Refuge	Albany County, WY	X	
9	Interstate 80	Albany County, WY	X	
11	Snowy Range Road / Big Hollow Road	Albany County, WY	X	X

1 KOP numbers also correspond to the Map ID numbers shown in Figure 6.

2 Nighttime simulations are computer generated and not based nighttime photography.

6 POTENTIAL EFFECTS ANALYSIS

Where visible and noticeable, the Project facilities have the potential to create visual effects. This section describes potential visual effects anticipated from the construction and operation of the Project. At the end of the Project's operational life, it would be decommissioned in accordance with a detailed Project decommissioning plan that would be developed in compliance with applicable laws, regulations, and best management practices. Decommissioning activities would be similar to construction activities but in reverse and would occur over a shorter period of time than initial construction. Once Project components have been removed, the visual character of the Project Area would return to pre-construction conditions.

6.1.1 Construction Impacts

Short-term visual effects would occur during construction of the Project and would result from construction activities and the presence of construction equipment and work crews. Construction activities associated with the Project would include the following:

- Surveying and staking
- Construction of temporary construction laydown areas
- Roadway improvements and construction of new access roads
- Trenching and placement of underground electrical collection lines
- Clearing and grubbing sites (i.e., Wind turbine pads, O&M facility, substations and switchyard)
- Construction of substation, switchyard, and wind turbine foundations
- Placement and erection of substation and switchyard equipment and wind turbine structures
- Construction of O&M facility
- Placement of perimeter fence around substations, switchyard and O&M facility sites
- Restoration

Viewers of the Project Area would see heavy construction equipment clearing vegetation and grading access roads, construction staging areas, and turbine foundations. These activities would move from place to place over the Project Area, and in some cases would be hidden from view, depending on the viewing location. Concrete trucks traveling to and from wind turbine locations and oversized load trucks hauling the large wind turbine components and substation equipment would be common along routes like Interstate 80, U.S. Highway 287, Cherokee Park Road, County Road 222/Hermosa Road and County Road 241/Pumpkin Vine Road during certain periods of construction. There would also be a noticeable increase in small vehicle traffic along those roads from workers traveling to and from the Project Area. One or more tall cranes would be required to assemble the components for each turbine. These cranes would need to be taller than the height of the turbine nacelle and would likely be more than 300 ft tall. Exhaust plumes from the heavy equipment may be seen. There would be increased fugitive dust from vehicle travel and grading activities, although EPMs that require construction crews to water unpaved roads and exposed soil to suppress dust would be implemented and would limit this effect.

Visual contrast introduced during Project construction would be evident primarily for local residents near the Project Area and travelers along routes that are nearby or traverse the Project Area, including local county roads, U.S. Highway 287, and Interstate 80, where the presence of construction equipment, materials, and crews would be prominent in the immediate foreground. Contrast is anticipated to be less apparent as the distance of the viewer to the construction activities increases. Views of Project construction from areas not within the foreground/midground distance zone (0 to 5 miles) of the Project Area would be mostly screened by intervening terrain and/or vegetation. Visual effects to these viewers would be mostly limited to construction traffic on U.S. Highway 287 or Interstate 80. With respect to the level of visual impact, the key characteristic of the construction impacts is that they would be temporary in duration.

As noted in Section 1.1, this VIA analyzed full build-out of the Project. However, it should be noted that the Project may be built in two phases; therefore, construction activities may occur twice. Although the overall characteristics of the potential impacts associated with construction activities as noted above would be similar for each construction phase, the amount of time that construction would occur and the amount of construction equipment, crews, and vehicles present on site would be less than if the whole Project was constructed at one time. Furthermore, when phase two begins, construction activities would be seen in the context of the Phase I Project components (i.e., wind turbines, substation, O&M facility).

6.1.2 Operation and Maintenance Impacts

Long-term visual effects during operation of the Project would result from the visibility of the above-ground components associated with the Project, including the wind turbines, meteorological towers, electrical collection system, substations and switchyard, overhead transmission line, O&M facility, and access roads.

6.1.2.1 Project Facility Characteristics

Wind Turbines

The proposed wind turbines would introduce contrasting elements of form, line, color, and texture to the existing landscape. The tall cylinders of the turbine towers would create a cluster of strong vertical lines that are unlike any other elements in the landscape. While other structures such as communication towers or transmission line structures exhibit similar characteristics, they do not occur at the size and scale or in as dense concentrations as would the proposed turbines. The dull white color of the turbines would contrast with the predominantly light green and brown colors of the landscape, although this contrast would be lower in the winter months when the vegetation turns a light gray and yellow color and is sometimes covered in snow. The smooth finish of the turbine components would introduce elements typically associated with industrial operations into a predominantly natural environment with few human-made alterations. During low sun-angle conditions, such as sunrise, sunset, and the winter months, the light is more directional and often emphasizes an object's texture or shape. The low-angle light is also filtered by more of the atmosphere, producing colors that are warmer in hue and are more saturated. These light

conditions would tend to make the turbines more visible and prominent than during different seasons or times of the day (BLM 2005). The movement of the turbine blades would be another source of visual contrast with the existing landscape. According to the 2013 BLM study (see Section 4.1.1), turbine blade movement is often visible at distances up to 24 miles.

The wind turbines would be the Project's most visible component. As suggested in the 2013 BLM study (Sullivan et al. 2013; see Section 4.1.1), wind turbines (under optimal viewing conditions) could be a major source of contrast at up to 10 miles. At this distance the turbines are a main focus of visual attention and may occupy a large portion of a person's field of view. As distance from the viewer and the wind turbines increase, contrast would decrease. The degree in which contrast would be decreased is dependent upon factors such as setting and viewer sensitivity (Sullivan et al. 2013). The overall visual impact of the wind turbines, based on consideration of the respective sources of contrast associated with the turbines and the applicable receptor characteristics, would vary by viewing location and is discussed for the respective KOPs in Section 6.1.2.4.

Meteorological Towers

Up to three permanent meteorological towers would be located strategically within the Project Area, one each in the western, southwestern and northeastern portions of the Project Area (Figures 1 and 2). The towers' tall lattice-type metal construction would be similar in form and line to existing communication towers in the vicinity as well as existing high-voltage transmission lines that cross the southern portion of the Project Area. The meteorological towers would be seen to varying degrees from roads that pass through or near the Project Area and from nearby residences. Views toward the meteorological towers from most perspectives would also include views of other Project components, most notably the wind turbines. Given the scale of the meteorological towers and limited number of structures in relation to the Project wind turbines, it is anticipated that, where visible, the meteorological towers would create weak contrast.

Electrical Collection System/Substations and Switchyard

The Project's electrical collection system includes 34.5 kV power collector lines, two substations (one for each Project phase), and a switching station. Some sections of the collector lines would be installed above-ground on wooden pole structures, typically ranging in height from 50 to 80 ft tall, and they would be visible to varying degrees, depending on the proximity of the viewer. The overhead collector lines would be seen in the context of other vertical Project components, including wind turbines, meteorological towers, 345 kV transmission line, and substation electrical equipment as well as high-voltage transmission lines that cross the southern portion of the Project Area. Given the size of the aboveground structures compared to other Project components, the overhead collector lines would likely create weak contrast where they are visible.

The electrical collection system would deliver power to the two Project substations. The Project substations would each be constructed on a 5-acre site enclosed by chain-link fencing. The substation serving Phase I of the Project (referred to herein as the Phase I substation) and switchyard would be located approximately 1.8 miles southwest of U.S. Highway 287 and would

be adjacent to the two high-voltage WAPA transmission lines. The substation serving Phase II of the Project (referred to herein as the Phase II substation) would be located along Dale Creek Road, approximately 2 miles east of U.S. Highway 287. Both substations would introduce vertical and geometric metal structures into a rural landscape setting that is characterized by flat to gently rolling terrain. Although the substations and switchyard would contrast with some of the elements of the existing landscape, their overall visual effect would vary depending on the portions of the substations and switchyard that are visible, distance of the substations and switchyard from the viewer, and if the substations and switchyard are seen in the context of other existing and proposed noticeable modification to the local natural landscape, including other Project components. For example, contrast is anticipated to be stronger where local residences traveling along Dale Creek Road⁴ are approaching or adjacent to the Phase II substation and would have open views toward the substation. Although the Phase II substation would be seen in the context of other Project components, including the wind turbines and the transmission line, due to the scale of the substation and the close proximity to the viewer, the Phase II substation would appear as a dominant feature. This visibility, however, would have a short duration for individual viewers because travelers would only be approaching and parallel to the Phase II substation for a limited time and their primary focus would be on the road ahead.

Aside from Dale Creek Road, the substations and switchyard sites are relatively distant from travel routes or stationary viewers, approximately 2 miles or greater. For viewers located approximately 2 miles from the substations/switchyard, contrast is anticipated to be reduced to weak where views would be partially screened by topography and portions of the substations and switchyard that are visible would be seen in the context of the Project wind turbines which would appear as dominant features in the landscape. From elevated viewing locations such as Boulder Ridge that are more than 2.5 miles west of the Project Area, the visual contrast of these Project components would also be weak because of the relatively small scale of the facilities in relation to the Project wind turbines which would appear as dominant features. It is anticipated that views of the substations and switchyard from locations in the background and seldom seen distance zones would be mostly to completely screened by topography, intervening vegetation or structures. For portions of the substations and switchyards that are visible, contrast would likely be weak, or would not be perceived due to the distance of the Project components from the viewer.

Overhead 345 kV Transmission Line

Approximately 4 miles of new single circuit, 345 kV overhead transmission line would connect the two Project substations. The transmission line structures would likely be wood H-frame or steel monopoles with a height between 100 to 125 ft, but may vary depending on terrain. The overhead distribution lines would introduce new vertical elements into the landscape setting. Viewers traveling U.S. Highway 287 where the transmission line crosses over the highway would have unobstructed views as they approach the transmission line. Although the transmission line would be seen in the context of other Project components, such as the wind turbines, due to the size of the transmission structures and the close proximity to viewers, the transmission line would attract

⁴ Dale Creek Road is a private road and would only be accessible by local residents.

attention and would appear as a co-dominant feature. As such, the transmission line would create moderate contrast. This visibility, however, would have a short duration for individual viewers because travelers would only be approaching and parallel to the transmission line crossing for a limited time and their primary focus would be on the road ahead. Views toward the transmission line from most other perspectives would also include views of other Project components, including wind turbines, meteorological towers, substation, overhead transmission line, and existing high-voltage transmission line. Given the scale of the transmission line in relation to other Project components and existing features in the landscape, it is anticipated that, where visible, the transmission line would create weak contrast. Furthermore, the transmission line would not be out of character with other overhead utility lines in the area, including the two high-voltage WAPA transmission lines that cross the southern portion of the Project Area, and existing distribution lines that serve rural residences in the area.

Operations and Maintenance Facility

The O&M facility would be located at the intersection of Boulder Ridge Road and Cherokee Park Road, two major county roads in the Project vicinity that provide access to the communities of Fish Creek Ranch Preserve and Boulder Ridge Estates. The new O&M facility would include an approximately 7,000-square-ft pre-fabricated steel building with a workshop/garage and office space. The building would have siding that would be painted in low-reflectivity paints in earth-tone colors (such as light tan) that blend with the surrounding landscape. The O&M facility would be seen to varying degrees from roads that pass through or near the Project Area and from nearby residences. Viewers traveling past the O&M facility on Boulder Ridge Road or Cherokee Park Road would have unobstructed views as they approach the facility in the foreground distance zone. However, these impacts would be short-term because travelers would only be approaching and parallel to the O&M facility for a limited time and their focus would be on the road ahead. Views toward the O&M facility from most other perspectives would also include views of other Project components, including wind turbines, meteorological towers, substation, overhead transmission line, and existing high-voltage transmission line. Given the scale of the O&M facility in relation to other Project components and existing features in the landscape, it is anticipated that, where visible, the O&M facility would create weak contrast. Furthermore, the O&M facility would be similar in form, scale, and color to agricultural buildings that are common in the area. Therefore, the O&M facility would not appear out of character with the existing landscape setting.

Access Roads

Up to approximately 60 miles of new all-weather access roads would be created to provide access to Project components; this would represent an increase in both the length and number of roads in the Project Area. These new roads would need to be graded and cleared of vegetation, which would create contrasting light, earth-tone, straight, and curvilinear bands on the landscape. In areas with steeper topography, clearing and grading would result in exposed slope faces. This extensive network of roads would break the uniform coverage of short, light green and brown grassland vegetation.

The new access roads would primarily be visible from local roads within the Project Area and nearby residences who would have unobstructed level viewing conditions towards the Project within the foreground. Viewers at elevated locations within the foreground would also see a large portion of the new access road network. Based on the distribution of travel routes and residences in the vicinity, there appear to be relatively few locations with these conditions. Although the access roads would create several linear, light bands within the landscape, the access roads that are visible would be similar to other local travel routes and roads used for farming or ranching within the area. The visual contrasts from the new access roads would continue to decrease for viewing locations further from the Project Area, such as along U.S. Highway 287 and Interstate 80, because the rolling terrain would partially to completely screen parts of roads from view. Given the low profile and small scale of the access roads in relation to other Project components and existing features in the landscape, it is anticipated that, where visible, the access roads would create weak contrast.

6.1.2.2 Nighttime Lighting

Wind Turbines

Aviation safety lighting would be installed on wind turbines to meet Federal Aviation Administration (FAA) guidelines (referred to herein as FAA lights) and would be mounted on the top of each wind turbine structure. The safety lighting would include two FAA Type L-864 red lights, one mounted on either side of the nacelle, so they are visible to pilots approaching from any direction. The FAA lights would be applicable to all wind turbines used for both the minimum and maximum turbine height scenarios.

The FAA lights would introduce visual contrast to the landscape during nighttime hours. Once the turbines for the Project have been constructed, there would potentially be 168 to 302 flashing red lights within the Project Area (depending on the turbine model selected), located approximately 292 to 410 ft above the ground. These lights would simultaneously flash 20 to 40 times per minute.

From some vantage points, FAA lights associated with the Project would be seen in the context of existing red flashing lights on the uppermost portion of the five communication towers within approximately 5 miles of the Project Area boundary. However, FAA lights associated with the Project FAA lights would introduce a dense horizontal cluster of flashing lights into a rural landscape that is relatively dark at night and would therefore introduce a greater degree of contrast than the existing lights. In addition, the height of the FAA lights would allow them to be seen from locations more than 25 miles away. Although the FAA lights can potentially be visible from great distances, the actual intensity of the lighting may appear no greater than other sources of nighttime lighting within and near the Project Area, including dual blinking red lights associated with communication towers, vehicle head and taillights, and some small-scale exterior lighting around residences and outbuildings.

A viewshed analysis based on nighttime conditions of the Project has not been prepared. However, based on the 2013 study prepared for the BLM (Sullivan et al. 2013), FAA lights were

noted as being visible at a distance of 36.2 miles.⁵ It is anticipated that locations within the visual study area that have potential views of wind turbine nacelles during day would also have potential views of the FAA lights at night. It is anticipated that all or most of the FAA lights would be visible from travel routes and residences in and near the Project Area that have unobstructed views toward the Project. For travelers along local and major travelways, the duration of visibility would be short-term because travelers would only be approaching and parallel to the Project Area for a limited time and their focus would be on the road ahead. In some instances, such as from roads located within the background or seldom seen distance zones, intervening terrain, vegetation and/or structures may partially or completely screen the Project Area. Strong contrast is anticipated for residential viewers within the foreground/midleground distance zone who have unobstructed to partially screened views towards the Project where the synchronized flashing lights would draw attention and dominate the nighttime setting. Contrast is anticipated to be reduced for residential viewers located farther from the Project Area. Regardless of the number of FAA lights visible, any lighting is more likely to be seen or noticeable from outside areas surrounding residences rather than within the residences, as lights within residential homes tend to reflect and mirror views in windows, or views outside are obscured by curtains or blinds.

In order to illustrate the potential visual effect of FAA lighting, nighttime simulations were created from two KOP locations, The Buttes (KOP 2) and Snowy Range Road/Big Hollow Road (KOP 11), which represent views from the foreground/midleground and seldom seen distance zones, respectively. Visual impacts for both of these KOPs are discussed in Section 6.1.2.4 and photographic simulations depicting nighttime conditions at these KOPs are included in Appendix B.

Although this analysis is based on the implementation of the FAA Type L-864 red lights, as noted above, ConnectGen plans to coordinate with the FAA on the feasibility of implementing an Aircraft Detection Lighting System (ADLS) (or a similar system) for the turbines, which would turn the aviation obstruction lights on and off in response to detection of nearby aircraft. Implementation of an ADLS is dependent upon a number of factors, including commercial availability, technical feasibility, and agency review and approval. However, if implemented, an ADLS would help to reduce the potential impact of nighttime lighting.

Public concern has also been raised regarding the potential astronomy-related impacts of nighttime lighting associated with the Project, particularly as it relates to the Red Buttes Observatory, located approximately 9 miles south of Laramie and 0.7 mile east of U.S. Highway 287 directly adjacent to The Buttes community. Astronomers are primarily concerned with the impacts of sky glow (a glow in the night sky derived from an artificial source such as the light of a city; Sullivan 2020). The required FAA Type L-864 red lights have a narrower spectrum and are less bright than full spectrum lights, which closely mimic natural daylight. These characteristics make them contribute very little to sky glow. In addition, there are a number of existing light sources of near the observatory, including the City of Laramie, security lights associated with

⁵ This was the maximum distance at which the FAA lights were officially recorded as visible in the study because topography prevented viewing the project facility from a greater distance.

nearby residences, and headlights from cars along U.S. Highway 287, that would likely contribute more potential sky glow than nighttime lighting associated with the Project. Furthermore, because the wind turbines are located approximately 7 miles or more from the observatory, the FAA lights would most likely be within a few degrees of the horizon, and thus would not cause direct interference with the majority of observations which are typically higher in the sky (Sullivan 2020).

One potential source of sky glow associated with the Project would be construction and operational lighting associated with the Project substations, O&M facility, laydown areas, and interconnection switchyard as these locations will use broader spectrum security lighting at night. As outlined in Table 6 below, EPMs will be implemented for nighttime lighting in these locations to reduce potential effects to nighttime skies, including placement of light caps and/or directing light downwards on outdoor facility lighting to minimize offsite glare.

Other Light Sources

In addition to the FAA lights associated with the wind turbines, other proposed nighttime light sources associated with the Project include manually activated emergency and security lighting located at the two substations and switchyard, and security lighting at the O&M facility.

Lights would be installed at each substation and the switchyard. This type of lighting is typically mounted at a height of 30 ft on static masts within the fenced area of the substations. The exact number of lights would be dependent upon final substation design. Lights would be directed downward toward equipment and the lights would only be turned on during a nighttime emergency repair or when Project personnel are performing other required maintenance. Security lights would be installed above the door of the control building at each substation. The security lights would be on during nighttime hours. Security lighting would be directed downward and shielded to avoid light trespass and nighttime light pollution impacts. Security lighting would also be located at the O&M facility and would be mounted above the doorways and remain on during nighttime hours.

The amount and character of the light generated by the substations and O&M facility would be consistent with commercial facilities that may employ similar lighting within the visual study area, such as Laramie Regional Airport and Mountain Cement Company. In addition, the proposed security lights would also be consistent with existing light sources within the visual study area including small-scale exterior lighting around residences, outbuildings, and commercial buildings near Tie Siding, Boulder Ridge, and along U.S. Highway 287.

6.1.2.3 Extent of Potential Visibility of the Wind Turbines

The geographic extent of potential visibility of the wind turbines within the visual study area was determined through the viewshed analysis, as discussed in Section 4.1.1. Based on the viewshed analyses for both the minimum and maximum turbine height scenarios, views are primarily limited to within 5 miles of the Project Area to the west, south, and east, with additional areas of potential

visibility in relatively higher-elevation areas and extended visibility to the northwest⁶ (Figures 3 and 4). The Laramie Mountains, which comprise the eastern portion of the Rocky Mountains, begins in northern Colorado and extends discontinuously into southeastern Wyoming between Cheyenne and Laramie. These mountains are the main factor limiting extended views to the west, south and east within the visual study area. The landscape to the northwest of the Project Area is comprised of a basin situated between the Medicine Bow and Laramie Mountain ranges. The relatively flat to moderately rolling terrain and limited vegetation allows for more expansive views to the northwest. Potential areas from which the Project may be visible include residences surrounding the Project Area, residential areas along the southern edge of Laramie, local roads within and adjacent to the Project Area, and portions of major travelways including Interstate 80, U.S. Highways 30 and 287, and Wyoming Highways 130 and 230. Locations identified as having potential visibility of the Project were field-verified as discussed in Section 4.2.3, with the results of existing views from each representative viewpoint described in Section 5.3. The degree of visibility for those viewers that would have visibility of the Project based on the viewshed and field verification are discussed below in Section 6.1.2.4.

6.1.2.4 Visual Effects at Key Observation Points

The visual impact assessment is based on evaluation of existing conditions and expected conditions with the Project at representative KOPs. The assessment covers 13 KOPs distributed throughout the visual study area (Figure 6). As discussed in Section 5.3, analysis for each KOP included the following components:

- Characterizing the existing landscape and visual resource conditions at the KOP
- Determining the expected or potential visibility of Project facilities from the KOP
- Rating the degree of visual contrast created by the Project for both minimum and maximum turbine height scenarios as seen from the KOP

This section includes the results of this site-specific impact evaluation process. The documentation includes assessment information for all KOPs applicable to the Project components. The content for each KOP includes a brief introduction identifying the KOP location and setting; a description of the existing landscape conditions; and a summary of the with-Project conditions for both the minimum and maximum turbine height scenarios (visibility, contrast rating, and viewer response components).

Table 5 provides a summary of the level of contrast (i.e., strong, moderate, weak, none) for each KOP within the visual study area. Photographs of existing conditions are included in Appendix A, photographic simulations for a subset of the KOPs are included in Appendix B, and Contrast Rating Worksheets for each KOP are located in Appendix C. The assessment results describing views with the Project implemented for each KOP are presented below. It should be noted that the assessments were based on the conditions that were experienced during the field visit (see

⁶ The results of the maximum turbine scenario viewshed were similar to the results of the minimum turbine height scenario viewshed in that the majority of areas identified as “seen” on both viewsheds were essentially the same.

Section 4.2.3). Typically, field conditions were clear and sunny (unless otherwise noted). It is anticipated that contrast would be reduced or not be perceived or visible under certain atmospheric conditions such as haze or fog.

Table 5: Summary of Contrast Rating of Key Observation Points in the Visual Study Area

KOP No. ¹	KOP Name	Distance to Project Area (miles)	Viewer Sensitivity	Existing Scenic Quality ²	Contrast Rating ³		Simulation Created for KOP ⁴
					Minimum Turbine Height Scenario (3MW Wind Turbine)	Maximum Turbine Height Scenario (6MW Wind Turbine)	
1	Tie Siding	0	Moderate (travelers) High (residents)	Common	Strong	Strong	Yes
2	The Buttes	5.4	Moderate (travelers) High (residents)	Common	Moderate	Moderate	Yes
3	Ames Monument	0.4	High (visitors) High (residents)	Common	Strong	Strong	Yes
4	Cherokee Park Road and Fish Creek Road	0.8	Moderate (travelers) High (residents)	Indistinctive	Strong	Strong	Yes
5	Virginia Dale Monument	6.3	Moderate (travelers)	Common	None	None	—
6	Laramie / City Ranch Road	11	High (residents)	Common	Weak	Moderate	—
7	Mortenson Lake National Wildlife Refuge/ Wyoming Highway 230	14	Moderate (travelers)	Common	Weak	Moderate	Yes
8	Medicine Bow–Routt National Forest	2.5	High (recreationists)	Common	Weak	Moderate	—
9	Interstate 80	4.5	Low (travelers)	Indistinctive	Weak	Weak	Yes
10	Arapaho and Roosevelt National Forest/ Prairie Divide Road	9.1	High (travelers/ residents)	Common	None	None	—
11	Snowy Range Road/ Big Hollow Road	22	High (travelers)	Common	Weak	Weak	Yes
12	U.S. Highway 30 - Willow Trail	20	Low (travelers)	Common	None	None	—
13	Bath Brothers Ranch / Herrick Road	25	High (travelers/ residents)	Common	None	None	—

1 KOP numbers also correspond to the Map ID numbers included on the map shown in Figure 6.

2 Landscape Class Rating based on BLM VRM System: Class A- Distinctive, Class B- Average or Common, Class C- Minimal or Indistinctive.

3 Visual Contrast Rating Worksheets for each KOP are included in Appendix C. Contrast Rating Worksheets for each KOP appear in the same order as they are listed in Table 5.

4 Visual simulations are included in Appendix B and appear in the same order as they are listed in Table 5.

KOP 1: Tie Siding

This viewpoint is located in the unincorporated area of Tie Siding on Hermosa Road/County Road (CR) 222 just east of U.S. Highway 287 and directly adjacent to the Project Area. The view orientation is to the southeast. This viewpoint represents through travelers and daily commuters traveling on U.S. Highway 287 between Laramie and Fort Collins and on local roads such as Hermosa Road/CR 222, as well as rural residences in the Tie Siding area⁷. Viewer sensitivity in this area would be classified as high for the residents, who are small in absolute number and account for a small proportion of the potential viewers in this location. Through travelers typically have a low sensitivity to changes in the landscape as they tend to be more focused on the road and destination-oriented, whereas higher sensitivity to visual change would be experienced by local commuters who are traveling through the area on a daily basis. Given the varying levels of sensitivity and high number of travelers associated with this viewpoint, overall response to visual change for travelers associated with this viewpoint is considered moderate.

Existing View

This viewpoint is located in an area with an indistinctive scenic quality rating; however, the scenic quality of the landscape seen from this viewpoint is considered common (Figure 5). Views from this viewpoint consist of U.S. Highway 287 in the foreground, open rangeland consisting of gently undulating terrain in the middleground rising to steeper rolling hills and the long, linear form of Boulder Ridge in the background to the south and west, respectively. Strong horizontal lines within the foreground are created by the highway and the horizontal undulating lines of the rolling hills and Boulder Ridge create a strong horizon line in the middleground and background. Vegetation is limited to grasses with some deciduous shrubs and trees clustered around residences and along drainage ways. The low vegetation allows for open expansive views from this viewpoint. Colors are primarily muted yellow-greens associated with the open rangeland with scattered patches of darker green associated with deciduous vegetation. Human-made modifications are limited to the highway, unpaved roads, street signs, and residential homes, and wind breaks are present in the foreground and middleground. Light poles at the intersection of U.S. Highway 287 and Hermosa Road/CR 222 and a communication tower are visible in the foreground and middleground, respectively, and high-voltage transmission lines are apparent rising above hills to the south in the background. Overall, the visual character is typical of the landscapes of the Laramie Basin ecoregion; as such, the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

The Project would introduce several tall, vertical elements into the landscape setting. The wind turbines would be visible extending above the horizon line. The wind turbines would appear as thin, white vertical lines. The bottom portions of the towers would most likely be screened by intervening topography. Due to the close proximity to the viewpoint and their height above the horizon, the turbines appear out of scale with the overall horizontal form of the existing landscape. Their white color also contrasts with the light blue color of the sky. Although the color of the wind

⁷ There are several rural residences located within a mile of this viewpoint, including a residence approximately 0.2 mile southeast.

turbines would change as lighting conditions change over the course of the day and year and the contrast of the wind turbines against the sky may be more muted at times, due to the scale and close proximity of the Project they would still attract attention. The vertical line of the wind turbines contrasts with the strong horizontal lines in the existing view. Addition of the wind turbines introduces a new industrial type use to a rural landscape setting. Although other vertical human-made features (i.e., communication towers and high-voltage transmission lines) are visible in the middleground and background in the existing view, the proximity of the wind turbines to the viewpoint, the introduction of vertical elements into a primarily horizontal landscape setting, the motion of the blades, and the spatial dominance within the landscape setting would cause the Project to attract attention and become a focal point within the view. As such, the Project would introduce strong visual contrast. A simulation depicting the minimum turbine height scenario is included in Appendix B.

View with the Project (Maximum Turbine Height Scenario)

Although the maximum turbine height scenario would introduce almost half as many wind turbines as the minimum turbine height scenario, the wind turbines associated with the maximum turbine height scenario would introduce the same level of visual contrast to the existing landscape setting. Given the close proximity of the wind turbines to the viewpoint, the introduction of vertical elements into a primarily horizontal landscape setting, the motion of the blades, and the spatial dominance within the landscape setting, the Project would attract attention and become a focal point within the view. As such, the Project would introduce strong visual contrast. A simulation depicting the maximum turbine height scenario is included in Appendix B.

KOP 2: The Buttes

This viewpoint is located in the unincorporated community of The Buttes⁸ on the east side of U.S. Highway 287 approximately 6.5 miles north of Tie Siding. The view orientation is to the southeast. This viewpoint represents through travelers and daily commuters traveling on U.S. Highway 287 between Laramie and Fort Collins, as well as rural residences in The Buttes community. Viewer sensitivity in this area would be classified as high for the residents, who are small in absolute number and account for a small proportion of the potential viewers in this location. Through travelers typically have a low sensitivity to changes in the landscape as they tend to be more focused on the road and destination-oriented, whereas higher sensitivity to visual change would be experienced by local commuters who are traveling through the area on a daily basis. Given the varying levels of sensitivity and high number of travelers associated with this viewpoint, overall response to visual change for travelers associated with this viewpoint is considered moderate. Viewer sensitivity for residential viewers associated with this viewpoint is considered high.

Existing View

This viewpoint is located in an area with an indistinctive scenic quality rating, and the scenic quality rating seen from this viewpoint is considered indistinctive in the foreground/middleground

⁸ The viewpoint was identified along U.S. Highway 287 because the road leading into The Buttes community was noted as a private road.

and background and common in the seldom seen distance zone (Figure 5). Views from this location consist of U.S. Highway 287 and open rangeland characterized by flat to gently rolling terrain with some small isolated hills in the foreground and middleground. The Medicine Bow Mountains are visible in the background, rising above a low berm that parallel to the highway. The grass covered terrain creates a fine texture that is punctuated by scattered rock outcroppings that are reddish-brown in color and contrast with the muted yellow-sage colored grasses. A large mineral extraction operation is visible to the southeast in the foreground which has created a large patch of tan that contrasts with the surrounding vegetation. Patches of darker green vegetation along the hills to the east and clumps of deciduous green vegetation along the highway and surrounding residences adds some variety in color and texture. U.S. Highway 287 and the Union Pacific Railroad that parallel the highway to the west create strong long linear lines in the foreground and middleground. Views from this viewpoint are relatively open and expansive due to the low terrain and lack of vegetation. Human-made modifications within the landscape include the highway, railroad, fences, rural residences, distribution line and communication tower, which add vertical elements to the landscape. A portion of the distribution line and the communication tower is skylined⁹ in the middleground and background, respectively. Even though there are some human-made modifications apparent in the view, overall, the visual character is typical of the landscape of the Laramie Basin ecoregion; as such, the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

The Project would introduce several tall, vertical elements into the landscape setting. However, it is anticipated that terrain in the foreground/middleground would screen lower portions of the wind turbines. Looking south along the highway, a greater portion of the wind turbine structures are visible extending above the horizon, while turbines to the southwest and southeast are partially to mostly screened by terrain leaving the nacelles and/or blades visible. The presence of other vertical features that punctuate the skyline, including a communication tower and distribution lines reduce the line and scale contrast presented by the Project. Color contrast is further reduced under the existing lighting/sky conditions. Although there are other human-made vertical features in the view, the number of wind turbines visible and the motion of the rotor blades are not likely to be overlooked and may appear as a co-dominant feature. As such, the Project would create moderate visual contrast. A simulation depicting the minimum turbine height scenario is included in Appendix B.

A nighttime photographic simulation¹⁰ depicting the minimum turbine height scenario was also prepared and is included in Appendix B. FAA lights on wind turbines where the nacelles are visible during the day would be visible during nighttime hours and would appear as a linear row of small red dots. The synchronized flashing of the FAA lights would attract viewers attention. However,

⁹ Skylined is when an object is seen in front of a contrasting color such as blue sky or a sunset and will be more likely to draw the viewers' attention.

¹⁰ Nighttime photographic simulations were computer generated using daytime photography captured in the field. Therefore, existing nighttime lighting that may occur in the view, such as those on communications towers, is not depicted in the photographic simulations.

FAA lights would only be visible for a portion of the wind turbines as several wind turbine nacelles are screened by terrain. The FAA lights would be similar in color, size, and intensity as other existing nighttime lights, including FAA lights associated with communication towers and moving taillights of vehicles along U.S. Highway 287. Although the FAA lights add a new source of nighttime lighting, they would be seen in the context of other light sources. As such, nighttime lights associated with the wind turbines would result in moderate contrast.

View with the Project (Maximum Turbine Height Scenario)

Although the maximum turbine height scenario would introduce almost half of the wind turbines as the minimum turbine height scenario, the wind turbines associated with the maximum turbine height scenario would introduce the same level of visual contrast to the existing landscape setting. From this viewpoint approximately the same number of wind turbines would be visible because only wind turbines in the northern and central portion of the Project Area would be visible from this viewpoint. Due to the taller wind turbines in the maximum turbine height scenario, more of the wind turbine structures would be visible extending above the horizon to the southeast and southwest. The number of wind turbines and the motion of the rotor blades are not likely to be overlooked and may appear as a co-dominant feature. As such, the Project would create moderate visual contrast. A simulation depicting the maximum turbine height scenario is included in Appendix B.

A nighttime photographic simulation depicting the maximum turbine scenario was also prepared and is included in Appendix B. It is anticipated that the FAA lights on wind turbines associated with the maximum turbine scenario would introduce a similar level of visual contrast to the existing landscape setting.

KOP 3: Ames Monument

This viewpoint is located at the Ames Monument located near the intersection of Hermosa Road and Monument Road and approximately 1.5 mile south of Interstate 80, and approximately 0.4 mile northeast of the Project Area. The Ames Monument is a large pyramid and commemorates the highest elevation along the route of the First Transcontinental Railroad. The monument was listed in the National Register of Historic Places in 1972 and designated a National Historic Landmark in 2016 (NPS 2020). It is important to note that the railroad was relocated several miles to the south of the monument in 1901 and visual evidence of the railroad no longer exists near the site. The monument is maintained as a Wyoming state historic site. The monument is open to the public and includes a parking area and interpretive signage. The view orientation is to the west-southwest. This viewpoint represents tourists and a national and state historic site. The Ames Monument receives over 16,000 visitors annually. Based on initial public scoping input, it is believed that visitors to the site (including local residences) would be visually sensitive to changes in the landscape setting from this location. Given the historic designation and public comment, overall viewer sensitivity for visitors associated with this viewpoint is considered high.

Existing View

This viewpoint is located in an area with a common scenic quality rating, and the scenic quality of the landscapes seen from this viewpoint is considered primarily common (Figure 5). Views from this viewpoint consist of rolling terrain in the foreground and middleground, a small portion of valley and Boulder Ridge is visible between the undulating terrain in the middleground and the Laramie Mountains and Medicine Bow Mountains are visible in the background to the southwest and west, respectively. Foreground and middleground views are dominated by open rangeland and the muted tan and sage green colors of the short grasses covering much of the landscape. Scattered small clumps of shrubs, deciduous vegetation, residences, and occasional rock outcrops provide some variety of color and texture. The mountain ranges in the background create an undulating horizon line that is somewhat diffused by the muted bluish-gray color of the mountains against the light blue of the sky. At this distance, the mountains appear mostly as dark horizontal forms. Human-made modifications include rural residences and ancillary structures (e.g., sheds, garages), distribution poles, wooden fences, and unpaved roads. There are also two communication towers located near this viewpoint: one located approximately 1.3 miles southeast and one located approximately 1 mile to the north. Overall, the visual character is typical of the landscapes of the Laramie Basin ecoregion; as such, the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

The Project would introduce tall, vertical elements into the landscape setting. Numerous wind turbines would be visible at various distances across the full field of view, with the closest wind turbines located approximately one mile from the viewpoint. Due to the close proximity of the wind turbines to the viewpoint, they would appear as dominant features within the landscape. The lower portion of the structures would be backdropped by rangeland and distant mountain ranges, but the upper portions of the structures would be skylined. The white color of the wind turbines would contrast against the blue sky. Contrast would become more apparent during certain times of the day, for example during sunset when the wind turbines are backlit, they may appear silhouetted against the sky. The motion of the wind turbine blades would also attract viewers attention. The perceived scale of the wind turbines diminishes as distance between the viewer structures increase. Wind turbines in the middleground would also be partially to mostly screened by intervening terrain in the foreground, with the exception of a small portion where the valley is visible. In this instance more of the wind turbine structures would be visible. Although other vertical human-made features (i.e., distribution line, communication tower) are visible in the foreground the number and scale of the wind turbines visible would be much larger and become a focal point within the view. The proximity of the wind turbines to the viewpoint, the introduction of vertical elements into a primarily horizontal landscape setting, the motion of the blades, and the spatial dominance within the landscape would cause the Project to appear dominant feature within the view. As such, the Project would introduce strong visual contrast. A simulation depicting the minimum turbine height scenario is included in Appendix B.

View with the Project (Maximum Turbine Height Scenario)

Although the closest wind turbines associated with the maximum turbine height scenario are located approximately one mile farther away from the viewpoint than the wind turbines associated with the minimum turbine height scenario, the maximum turbine height scenario would be approximately 175 ft taller and would introduce the same level of visual contrast to the existing landscape setting. Several wind turbines would be visible in the foreground. The close proximity of the wind turbines to the viewpoint, the introduction of vertical elements into a primarily horizontal landscape setting, the motion of the blades, and the spatial dominance within the landscape setting would cause the Project to attract attention and become a dominant feature within the view. As such, the Project would introduce strong visual contrast. A simulation depicting the maximum turbine height scenario is included in Appendix B.

KOP 4: Cherokee Park Road/Fish Creek Road

This viewpoint is located at the intersection of Fish Creek Road and Cherokee Park Road near the base of Boulder Ridge approximately 1.5 miles north of the Wyoming/Colorado border. The view orientation is east. This viewpoint represents rural residences along Elk Crossing Road in the Fish Creek Ranch Preserve, a private ranch¹¹ consisting of approximately 4,200 acres on the slopes of Boulder Ridge, as well as through travelers and daily commuters along Cherokee Park Road. The ranch provides its homeowners access to more than 3,700 acres of wildlife habitat that can be used for hiking, biking, fishing, horseback riding, or wildlife viewing. The ranch also borders the Arapaho-Roosevelt National Forest, which provides access to the same types of recreation opportunities mentioned above. Although the total number of residential viewers associated with this viewpoint is low, homeowners in the ranch have expressed a high sensitivity to changes to the visual character of the existing landscape. They have also noted appreciation for the landscape qualities, and orientation of their homes to the east to take advantage of the views. Therefore, overall viewer sensitivity for residences associated with this viewpoint is considered high. Through travelers typically have a low sensitivity to changes in the landscape as they tend to be more focused on the road and destination-oriented, whereas higher sensitivity to visual change would be experienced by local commuters who are traveling through the area on a daily basis. Given the varying levels of sensitivity and low number travelers (both through and daily commuters) associated with this viewpoint, overall viewer sensitivity for travelers associated with this viewpoint is considered moderate.

Existing View

This viewpoint is located in an area with an indistinctive scenic quality rating, and the scenic quality of the landscapes seen from this viewpoint is considered indistinctive to common (Figure 5). Views from this location are dominated by gently rolling prairie grasslands in the foreground and middleground. A slight rise in the topography to the northeast of this viewpoint obscures views of the valley and mountains beyond. This terrain forms the visible horizon against a hazy light blue sky. Low rolling hills associated with the Laramie Mountains is visible in the background to

¹¹ Since the preserve is privately owned, the location of the viewpoint was identified as a representative view on public property.

the southeast. These hills are covered in dense dark green vegetation which creates a low dark linear band along the horizon. Variety in vegetation, color is limited to the short, pale yellow/sage colored grasses which creates a fine texture across the landscape. Human-made modifications are limited to a wire fence along the road and two high-voltage transmission lines that cross the open prairie landscape in the middleground. Due to the lack of variety in the key characteristics that compose this landscape, the scenic quality rating is considered indistinctive.

View with the Project (Minimum Turbine Height Scenario)

The Project would introduce several tall, vertical elements into a relatively flat, horizontal landscape setting. Numerous wind turbines would be visible at various distances across the full field of view, with the closest wind turbines located approximately a mile from the viewpoint. The upper portions of the wind turbine structures would be skylined and the white color of the wind turbines would contrast against the blue sky. Contrast would become more apparent during certain times of the day, for example during sunrise when the wind turbines are backlit, they may appear silhouetted against the sky. The motion of the wind turbine blades would also attract viewers attention. Wind turbines located east of U.S. Highway 287 in the background would most likely be partially screened by the rise in topography just east of the viewpoint in the middleground. However, the upper portions of wind turbines would be visible extending above the terrain. Although the wind turbines would be seen in the context of the existing high-voltage transmission lines, the scale of the wind turbines would be much greater than the transmission line structures. Due to the close proximity of the wind turbines to the viewpoint, the number of wind turbines visible, the motion of the wind turbine blades, and the spatial dominance within the landscape, the Project would attract attention and become a focal point within the view. As such, the Project would introduce strong visual contrast. A simulation depicting the minimum turbine height scenario is included in Appendix B.

View with the Project (Maximum Turbine Height Scenario)

Although the maximum turbine height scenario would introduce almost half of the wind turbines as the minimum turbine height scenario, the wind turbines associated with the maximum turbine height scenario would introduce the same level of visual contrast to the existing landscape setting. From this viewpoint a similar number of wind turbines would be located along the Project Area's western boundary with wind turbines within approximately 1 mile of the viewpoint. The close proximity of the wind turbines to the viewpoint, the introduction of vertical elements into a primarily horizontal landscape setting, the motion of the blades, and the spatial dominance within the landscape setting would cause the Project to attract attention and become a focal point within the view. As such, the Project would introduce strong visual contrast. A simulation depicting the minimum turbine height scenario is included in Appendix B.

KOP 5: Virginia Dale Monument

This viewpoint is located in the unincorporated community of Virginia Dale near the intersection of U.S. Highway 287 and North County Road 13F, located approximately 4 miles south of the Wyoming border. The view orientation is the northwest. Virginia Dale was a famous stop on the Overland Trail. The settlement is memorialized by historical marker located approximately 0.3

mile south of the historic stage stop. This viewpoint represents primarily travelers along U.S. Highway 287 and a historic site. Through travelers typically have a low sensitivity to changes in the landscape as they tend to be more focused on the road and destination-oriented, whereas higher sensitivity to visual change would be experienced by local commuters who are traveling through the area on a daily basis. Given the varying levels of sensitivity, the presences of a historical site and high number of travelers associated with this viewpoint, overall viewer sensitivity for travelers associated with this viewpoint is considered moderate.

Existing View

This viewpoint is located in an area with a common scenic quality rating, and the scenic quality of the landscapes seen from this viewpoint is considered common (Figure 5). Views from this viewpoint consist of U.S. Highway 287 and moderately rolling hills transitioning into steeper terrain associated with the Laramie Mountains in the middleground and background. Rock outcroppings are apparent along the hillsides in the foreground. The horizon line is punctuated by trees and shrubs scattered over the rolling hills in the foreground and middleground, making the horizon line less defined. The rugged terrain is covered by a variety of vegetation which creates a coarse texture. The pale yellow grasses that covers much of the terrain contrasts with the irregular dark green patches created by dense stands of trees and trees scattered along the slopes. Human-made modifications include the highway and associated signs and safety markers, distribution lines, residences, fences and utility boxes. Although there is more variety in the key characteristics that comprise this landscape, it is still fairly common within the Southern Rockies ecoregion. As such, the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

Views toward the Project would be completely screened by the Laramie Mountain Range. As such, the Project would introduce no visual change.

View with the Project (Maximum Turbine Height Scenario)

Views toward the Project would be completely screened by the Laramie Mountain Range. As such, the Project would introduce no visual change.

KOP 6: Laramie/City Ranch Road

This viewpoint is located at the southern edge of the City of Laramie on City Ranch Road and approximately 400 ft east of U.S. Highway 287. The view orientation is south. Laramie is a city with a population of approximately 31,000 people according to the 2010 census (U.S. Census Bureau 2020). This viewpoint represents residences associated with the city of Laramie. Viewer sensitivity for residential viewers associated with this viewpoint is considered high.

Existing View

This viewpoint is located in an area with an indistinctive scenic quality rating, and the scenic quality of the landscapes seen from this viewpoint is considered indistinctive to the south and common to the east (Figure 5). Views from this location consist of flat open grassland in the

foreground extending to south and surrounded by moderately rolling hills visible in the middleground to the east and the Laramie Mountain Range visible in the background to the southwest. The mountains appear as a dark linear form along the horizon. The low prairie grasses create a fine texture within much of the landscape with the pale yellow-sage green color contrasting with the darker vegetation covering the hills to the east and dark form of the mountains to the south. Dark green vegetation surrounding a rural residence in the foreground creates a dark green line that contrasts with the surrounding prairie grasses and draws the viewers' attention. U.S. Highway 287 is also visible within the foreground and creates a thin gray line that becomes screened by topography in the middleground. Other human-made features within the view include low, barbed-wire fences, residences and associated out-structures, and a small windmill. Overall, the visual character is typical of the landscapes of the Laramie Basin ecoregion; as such, the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

From this viewpoint the Project wind turbines located east of U.S. Highway 287 would be mostly to partially screened by intervening terrain within the valley between the viewer and the Project. The wind turbines west of U.S. Highway 287 would be more visible (i.e., full rotor blade and portion of the structure tower would potentially be visible). The wind turbines that are visible would appear as thin white lines in the background. Some of the wind turbines would be backdropped by the Laramie Mountains which would accentuate color contrast, making the wind turbines appear lighter against the dark bluish-black mountains. However, some of the wind turbines would also be skylined against the light blue sky, which would decrease color contrast, although the turbines may present more color contrast with the sky under different weather conditions. The wind turbines' vertical lines would appear smaller in scale to the existing roadside utility poles located along U.S. Highway 287 that are visible from this viewpoint. Although the Project would introduce new human-made features into the landscape, they would be seen in the context of other existing human-made features, most notably the utility poles along the highway. Furthermore, their distance from the viewer reduces their perceived scale contrast, and the light-colored sky minimizes color contrast. The turbines do not extend above the height of the mountain form in the background and are confined to a relatively small portion of the background landscape. While they may attract some viewer attention, they would not appear as dominant features in the landscape. As such, the Project would introduce weak contrast.

View with the Project (Maximum Turbine Height Scenario)

The maximum turbine height scenario would introduce almost half of the wind turbines as the minimum turbine height scenario; however, due to the taller structures, more of the wind turbines located east of U.S. Highway 287 would be visible extending above intervening terrain. This would result in a more spatially dominant appearance of the wind turbines in the background because they extend across the horizon between the rolling hills and Laramie Mountains. Furthermore, the wind turbines would break the horizontal plane and visually connect these two previously separated landforms. Due to the distance of the wind turbines, they would appear similar in scale to the distant mountains and rolling hills and smaller in scale than the existing utility poles along the highway. The introduction of the wind turbines would attract viewers attention, however, due

to the distance to the viewpoint and similar scale to other features in the landscape, the wind turbines would appear as co-dominant features. As such, the Project would introduce moderate contrast.

KOP 7: Mortenson Lake National Wildlife Refuge / Wyoming Highway 230

This viewpoint is located on Wyoming Highway 230 along the eastern boundary of the Mortenson Lake National Wildlife Refuge (NWR) and approximately 9 miles southwest of Laramie, Wyoming. The view orientation is southeast. The Mortenson Lake NWR encompasses 1,776 acres and consists of four lakes and is managed by the Arapaho NWR in Walden, Colorado. According to the U.S. Fish and Wildlife Service website, the Mortenson Lake NWR is closed to the public due to the endangered status of the Wyoming toad (USFWS 2013). Wyoming Highway 230 is a 78-mile highway that is divided into two segments. The portion of the highway within the visual study area begins in Laramie and extends southwest to the Wyoming/Colorado border. This viewpoint represents travelers through travelers and daily commuters along Wyoming Highway 230. Through travelers typically have a low sensitivity to changes in the landscape as they tend to be more focused on the road and destination-oriented, whereas higher sensitivity to visual change would be experienced by local commuters who are traveling through the area on a daily basis. Given the varying levels of sensitivity and low number travelers (both through and daily commuters) associated with this viewpoint, overall viewer sensitivity for travelers associated with this viewpoint is considered moderate. Recreationists were not considered for this location due to the closure status of Mortenson Lake NWR.

Existing View

This viewpoint is located in an area with a common scenic quality rating, and the scenic quality of the landscapes seen from this viewpoint is considered common (Figure 5). Views from this location consist of flat open grassland in the foreground extending to southeast with the Laramie Mountains and Boulder Ridge visible in the background to the east and south-southeast, respectively. There is a gap between the two landforms where the grasslands extend to the horizon line. The mountains and ridge appear as a dark linear form along the horizon. The low prairie grasses create a fine texture which dominates the landscape. The pale yellow-sage green color of the grasses creates moderate contrast with the darker color of the landforms in the background. A thin line of dark green vegetation is also visible in the middleground, most likely associated with residential development. Human-made features are largely void from this viewpoint with the exception of a low barbed-wire fence and utility transmission line that parallels the highway. The fence includes short vertical elements and the utility transmission line, includes tall, thin, silver vertical elements, and both features appear even and ordered. Overall, the visual character is typical of the landscapes of the Laramie Basin ecoregion; as such, the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

From this viewpoint the Project would introduce several short thin lines into a predominantly horizontal landscape setting. Some of the wind turbines would be partially to completely screened by Boulder Ridge, however, the wind turbines that are not screened would appear along the horizon line between the ridge and mountains to the east and would be skylined against the light

blue sky which minimizes color contrast. The wind turbines' vertical lines would appear smaller in scale to the existing fence posts and utility poles located along Wyoming Highway 230 that are prominent features from this viewpoint. Although the Project would introduce new human-made features into the landscape, they would be seen in the context of other existing human-made features, most notably the utility poles along the highway. Furthermore, their distance from the viewer reduces their perceived scale contrast, and the light-colored sky minimizes color contrast. While they may attract some viewer attention, they would not appear as dominant features in the landscape. As such, the Project would introduce weak contrast. A simulation depicting the minimum turbine height scenario is included in Appendix B.

View with the Project (Maximum Turbine Height Scenario)

The maximum turbine height scenario would introduce almost half of the wind turbines as the minimum turbine height scenario, however, due to the taller structures, more of the wind turbines would be visible along the horizon. This would result in a more spatially dominant appearance of the wind turbines in the background because they extend across the horizon between the Boulder Ridge and the Laramie Mountains. Furthermore, the wind turbines would break the horizontal plane and visually connect these two previously separated landforms. Due to the distance of the wind turbines, they would appear similar in scale to the distant ridge and mountains and smaller in scale than the existing utility poles along the highway. The introduction of the wind turbines would attract viewers attention, however, due to the distance to the viewpoint and similar scale to other features in the landscape, the wind turbines would appear as co-dominant features. As such, the Project would introduce moderate contrast. A simulation depicting the maximum turbine height scenario is included in Appendix B.

KOP 8: Medicine Bow-Routt National Forest

This viewpoint is located within a Medicine Bow-Routt National Forest (NF) campground located along the western slopes of the mountain, approximately 0.7 mile north of Interstate 80 and 4.5 miles west of Buford. The view orientation is southwest. The Medicine Bow-Routt National Forest is managed by the USFS and covers lands across portions of Wyoming and Colorado. The viewpoint is located in an area of the forest that consists of numerous rock outcroppings. This viewpoint represents recreationists in the area who may be partaking in one of the many activities offered, which include hiking, camping, fishing, sightseeing, wildlife viewing, and rock climbing. Due to the passive nature of some of these activities, recreational users may have continuous views over an extended period of time. For example, campers may stay for several days. Overall viewer sensitivity for recreationists associated with this viewpoint is considered high.

Existing View

This viewpoint is located in an area with an indistinctive scenic quality rating, and the scenic quality of the landscapes seen from this viewpoint is considered common (Figure 5). Views from this viewpoint consists of gently rolling terrain in the foreground with views of the Laramie Mountains appearing as a dark linear form in the background. The mountains blend into the rolling terrain in the middleground and create the horizon line. The vegetation consists of low pale-yellow and sage colored grasses. A stand of evergreen and deciduous trees surrounds the open space of the campground and creates a loose, linear line in the middle of the view. The dark green and

bright yellow of the vegetation adds color contrast as well as variety in form and texture. As such, the vegetation is a focal point drawing the viewer's attention. Furthermore, the vegetation punctuates the horizontal line within the view. Four existing communication towers are also visible on the horizon, between gaps in the vegetation. Aside from the communication towers, human-made features are limited to a wooden split-rail fence in the foreground and structures that are presumably associated with the towers. Although there is more variety in the key characteristics that compose this landscape, it is still fairly common within the Laramie Basin ecoregion. As such, the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

Views toward the Project would be mostly screened by intervening terrain in the middleground or vegetation in the foreground. Portions of the Project that may be visible would include the upper portions of the wind turbine blades as they pass over the terrain in the middleground. The wind turbine blades would be backdropped by the dark color of the mountains, which would increase color contrast, however, the turbines may present less color contrast with the sky under different weather conditions. The presence of other vertical features that punctuate the skyline, including existing vegetation and communication towers, reduce the line and scale contrast presented by the Project. Although the motion of the blades may attract attention, the limited number and thin form of the blades visible would appear as subordinate features in the landscape. As such, the Project would create weak visual contrast.

View with the Project (Maximum Turbine Height Scenario)

The maximum turbine height scenario would introduce almost half of the wind turbines as the minimum turbine height scenario, however, due to the taller structures, more of the wind turbines would be visible extending above intervening terrain. Furthermore, more of the individual wind turbine structures would also be visible including the nacelle and upper portion of the blade. The portions of the wind turbines that are visible would be smaller in scale than the existing vegetation; however, the wind turbines would introduce moderate line, form and color contrast to the more natural, loose pyramidal forms of the vegetation. The introduction of the wind turbines would attract viewers attention; however, due smaller scale of the wind turbines to other features in the landscape, the existing vegetation that disrupts the horizon line and the existing communication towers visible in the view, the wind turbines would appear as co-dominant features. As such, the Project would introduce moderate contrast.

KOP 9: Interstate 80

This viewpoint is located along Interstate 80 near Exit 335 in Buford, an unincorporated community approximately 17 miles southeast of Laramie. The view orientation is southwest. Interstate 80 is an east-west transcontinental freeway that traverses across the southern portion of Wyoming. In Wyoming, the highest point along the highway is near Buford. The highway is a major transportation corridor and consists primarily of through-travelers traveling at high rates of speed. Because of the limited viewing duration, and the fact that most through travelers are destination oriented and focused on the road and traffic conditions, the viewer sensitivity for travelers along Interstate 80 are considered low.

Existing View

This viewpoint is located in an area with a common scenic quality rating, and the scenic quality of the landscape seen from this viewpoint is also considered common (Figure 5). Views from this viewpoint consist flat level landscape in the immediate foreground, transitioning to gently to moderately rolling in the middleground with views of the Laramie Mountains and Boulder Ridge appearing as dark linear forms in the background. The mountains and ridge blend into the rolling terrain in the middleground and create the horizon line. The horizon line is punctuated by several strong vertical elements in the foreground including a communication tower, utility poles, and structures associated with the Buford rest stop. Vegetation consists primarily of low, pale-yellow grasses with darker evergreen vegetation scattered in small clumps or dotted across the landscape which adds some variety in color and texture. The human-made features add additional colors of brown, reddish-brown, green, white, and gray. Additional human-made features visible from this viewpoint includes a split-rail fence, gravel parking area, railroad, and signs along the highway. Although the BLM scenic quality rating for this area indicates views towards landscapes considered to have common scenic quality, given the human-made vertical elements dominant within this view, the overall scenic quality rating is considered indistinctive.

View with the Project (Minimum Turbine Height Scenario)

Views toward the Project would be mostly screened by intervening terrain in the middleground with only the wind turbines located near the southern and southeastern portion of the Project Area visible. Of the wind turbines that would be visible, only the upper portion of the structures (typically from the nacelle up) would be visible extending above the horizon. The wind turbines would be backdropped by the light blue color of the sky which would help to minimize color contrast. However, the turbines may present more color contrast with the sky under different weather conditions. Although the movement of the wind turbine blades may attract the viewers' attention, due to the limited number of turbines visible and the existing vertical structures in the foreground in which the Project would be seen, the wind turbines would appear as subordinate features in the landscape. As such, the Project would introduce weak visual contrast. A simulation depicting the minimum turbine height scenario is included in Appendix B.

View with the Project (Maximum Turbine Height Scenario)

The maximum turbine height scenario would introduce almost half of the wind turbines as the minimum turbine height scenario, however, due to the taller structures, more of the wind turbines would be visible extending above intervening terrain. Furthermore, more of the individual wind turbine structures would also be visible extending above the horizon. The wind turbines would appear smaller in scale than the existing vertical elements in the foreground, however, they would add an additional element of busyness or visual clutter to the view. Given the limited number of wind turbines visible, the existing human-made features that would continue to be dominant features on the landscape and the short duration that the viewer would have as they travel along the highway, the Project would attract attentions but appear as a subordinate feature in the landscape. As such, the Project would introduce weak visual contrast. A simulation depicting the maximum turbine height scenario is included as in Appendix B.

KOP 10: Arapaho and Roosevelt National Forest/Prairie Divide Road

This viewpoint is located within the Arapaho and Roosevelt National Forest, along Prairie Divide Road, approximately 10 miles west of U.S. Highway 287 and 9 miles south of the Colorado/Wyoming border. The view orientation is to the north. The viewpoint represents daily commuters on local roads and rural residences in the area¹². Viewer sensitivity in this area would be classified as high for the residents. Although the traffic volume is assumed to be relatively low, given the distance from major transportation corridors and limited land uses within the surrounding area, it is anticipated that higher sensitivity to visual change would be experienced by local commuters who are traveling through the area on a daily basis. Overall, viewer sensitivity for residential viewers and local daily commuters associated with this viewpoint is considered high.

Existing View

This viewpoint is located in an area with a common scenic quality rating, and the scenic quality of the landscape seen from this viewpoint is also considered common (Figure 5). Views from this viewpoint consist of national forest lands, characterized by moderately rolling terrain in the foreground transitioning to steeper more rugged terrain in the middleground and background. The Pole Mountain Area is visible in the background to the northeast. The valley north or the Laramie Mountains is not visible from this viewpoint. Due to the downward sloping terrain and lack of vegetation in the immediate foreground, open views across the mountains are experienced from this viewpoint. Foreground views are dominated by open grassland bordered by a dense stand of evergreen trees which creates a dark green band that contrasts in color with the lighter pale yellow of the grasses. The coarse texture of the vegetation and outcroppings contrasts with the fine texture of the open field. The background is defined by the forested ridgeline of the Laramie Mountains that form the visible horizon against a hazy light blue sky. Human-made modifications visible from this viewpoint are limited primarily to the unpaved road and rural residential structures tucked within the dense stand of trees. Although there is more variety in the key characteristics that comprise this landscape as compared to valleys, it is still fairly common within the Southern Rockies ecoregion. As such, the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

Due to the distance of the viewpoint to the Project and the intervening terrain associated with the Laramie Mountain Range, views toward the Project would be completely screened. As such, the Project would introduce no visual change.

View with the Project (Maximum Turbine Height Scenario)

Due to the distance of the viewpoint to the Project and the intervening terrain associated with the Laramie Mountain Range, views toward the Project would be completely screened. As such, the Project would introduce no visual change.

¹² There are several residences within approximately 1 mile of this viewpoint.

KOP 11: Snowy Range Road/Big Hollow Road

This viewpoint is located on Big Hollow Road just south of Snowy Ridge Road approximately 12 miles west of Laramie, Wyoming. The view is oriented to the southwest. The highway is an alternative route to Interstate 80 that goes through the Snowy Range Mountains. A portion of the Snowy Range Road is designated as a scenic byway; however, the scenic designated portion begins in Centennial, Wyoming located approximately 9 miles west of the visual study area boundary.¹³ Through travelers and commuters are the most likely users along this travel route. However, because this route is an alternative to a major thoroughfare (Interstate 80) and connected to a designated scenic byway, overall viewer sensitivity is considered high.

Existing View

This viewpoint is located in an area with an indistinctive scenic quality rating, and the scenic quality of the landscapes seen from this viewpoint is considered indistinctive surrounded by common (Figure 5). Views from this location are elevated and look out over an expansive valley floor surrounded by the Laramie Mountains to the east and southeast and Boulder Ridge to the south. There is a gap between the two landforms where the grasslands extend to the horizon line. The mountains and ridge appear as a slightly darker linear forms due to the forested slopes and ridges. The valley is dominated by the pale-yellow and sage green color of the grasses. A line of dark green vegetation is visible in the middleground and most likely associated with a waterway, however, at this distance and in the open landscape setting, it does not likely draw the viewers' attention. Other human-made features visible within the landscape include an unpaved road, wind fences, rural residence and utility poles near the highway. Overall, the visual character is typical of the landscapes of the Laramie Basin ecoregion; as such, the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

From this viewpoint the Project would introduce several short thin white lines into a predominantly horizontal landscape setting. Given the rural nature of the landscape setting the Project would introduce a more industrial land use. Some of the wind turbines would be partially backdropped by the terrain of the valley floor although many would be skylined against the light blue sky. The thin form of the rotor blades may not be perceived at this distance, thereby reducing color contrast. The wind turbines' vertical lines would appear smaller in scale to existing vertical features in the foreground as well as smaller than the adjacent landforms in the background. At a distance of approximately 22 miles the motion of the rotor blades may not be perceived, further diminishing contrast. Therefore, it is anticipated that the wind turbines would appear as subordinate features in the expansive, open landscape setting. As such, the Project would create weak visual contrast. A simulation depicting the maximum turbine height scenario is included as in Appendix B.

¹³ Photographs were taken from Centennial during the September 2019 field visit and views toward the Project Area were determined to be completely screened by terrain associated with Sheep Mountain to the southeast.

A nighttime photographic simulation¹⁴ depicting the minimum turbine height scenario was also prepared and is included in Appendix B. FAA lights on wind turbines would appear as a linear row of small, red dots. The synchronized flashing of the FAA lights would attract viewers attention. The FAA lights would be similar in color, size and intensity as other existing nighttime lights, including FAA lights associated with communication towers and moving taillights of vehicles along roadways. Furthermore, lights associated with the city of Laramie are also visible from along this road¹⁵ and introduce a significant source of light into the nighttime landscape. Although the FAA lights add a new source of nighttime lighting, other light sources are evident from along Snowy Range Road. As such, nighttime lights associated with the wind turbines would result in moderate contrast.

View with the Project (Maximum Turbine Height Scenario)

Although the maximum turbine height scenario would introduce almost half of the wind turbines as the minimum turbine height scenario, the wind turbines associated with the maximum turbine height scenario would introduce the same level of visual contrast to the existing landscape setting. Although the Project would introduce new human-made features into the landscape, their distance from the viewer reduces their perceived scale contrast, and the light-colored sky minimizes color contrast. While they may attract some viewers attention, they would not appear as dominant features in the landscape. As such, the Project would introduce weak contrast. A simulation depicting the minimum turbine height scenario is included as in Appendix B.

A nighttime photographic simulation depicting the maximum turbine height scenario was also prepared and is included in Appendix B. It is anticipated that the FAA lights on wind turbines associated with the maximum turbine height scenario would introduce the same level of visual contrast to the existing landscape setting.

KOP 12: U.S. Highway 30/ Willow Trail

This viewpoint is located along U.S. Highway 30 near Willow Trail approximately 4.5 miles north of Laramie, Wyoming. The view orientation is to the south. U.S. Highway 30 is a major travel route that extends north of Laramie and turns west and eventually connects to Interstate 80 approximately 70 miles west of Laramie. Travelers along U.S. Highway 30 consist of through travelers and daily commuters. Through travelers typically have a low sensitivity to changes in the landscape as they tend to be more focused on the road and destination-oriented, whereas higher sensitivity to visual change would be experienced by local commuters who are traveling through the area on a daily basis. Given the varying levels of sensitivity, high number travelers (both through and daily commuters), and proximity to an urban area, overall viewer sensitivity for travelers associated with this viewpoint is considered low.

¹⁴ Nighttime photographic simulations were computer generated using daytime photography captured in the field. Therefore, existing nighttime lighting that may occur in the view, such as those on communications towers, is not depicted in the photographic simulations.

¹⁵ The nighttime photographic simulations do not depict lights associated with the city of Laramie as the view is oriented farther to the southeast.

Existing View

This viewpoint is located in an area with an indistinctive scenic quality rating, and the scenic quality of the landscapes seen from this viewpoint is considered indistinctive to the south and common to the east and southeast (Figure 5). Views from this location are at a slightly elevated point along the highway, which appears as a long linear line disappearing into the middleground. Views are dominated by open grasslands in the foreground and middleground with views of the Laramie Mountains to the southeast extending to the south and southwest in the background distance zone. Due to the low clouds on the horizon, the dark bluish form of the mountains in the background blend with the low clouds making a portion of the horizon line difficult to distinguish to from this viewpoint. Vegetation is predominantly low grasses except for darker trees and shrubs clustered around residences and commercial development near Laramie in the middleground. Human-made features are visible from this viewpoint and include residences and associated out structures, fences, communication towers, utility distribution and a railroad that parallels the highway to the west. The majority of development associated with Laramie is screened by a small rise in the terrain between the viewpoint and the city. Although there are more human-made elements visible from this location, the open grasslands and surrounding mountain ranges are dominant features within the view. Overall, the visual character is typical of the landscapes of the Laramie Basin ecoregion; as such, the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

From this viewpoint, the majority of the Project would be screened by intervening terrain. Portions of wind turbines that extend above terrain would be primarily limited to the upper portion of the turbine blades and tips of the turbines. It is anticipated that the thin lines created by the blades would not be noticeable or perceived by viewers along the highway at this distance. As such, the Project would create no visual contrast. Furthermore, under varying atmospheric conditions such as haze or fog the Project would not be visible.

View with the Project (Maximum Turbine Height Scenario)

The maximum turbine height scenario would introduce almost half of the wind turbines as the minimum turbine height scenario; however, due to the taller structures, more of the wind turbine structures would be visible extending above intervening terrain in the middleground. However, the change in wind turbine height would most likely not be perceived at this distance. As such, the Project would not be noticeable or perceived at this distance and result in no visual contrast.

KOP 13: Bath Brothers Ranch/Herrick Road

This viewpoint is located near Bath Brothers Ranch on Herrick Road approximately 1 mile west of Interstate 80. The ranch is one of the first established in Albany County, Wyoming. The ranch, which consists of a stone house and barn, was established around 1870. The ranch was listed in the NRHP in 1985 (Wyoming SHPO 2020). The ranch is privately owned and currently used for horse breeding. The view orientation is to the southeast. This viewpoint represents travelers along a local roadway and rural residences, including Bath Brothers Ranch which also represents a historic site. Although the ranch is NRHP listed, it is privately owned and not open and accessible

to the general public. Overall, viewer sensitivity for residential viewers and local daily commuters associated with this viewpoint is considered high.

Existing View

This viewpoint is located in an area with a common scenic quality rating, and the scenic quality of the landscape seen from this viewpoint is considered both indistinctive and common (Figure 5). The common rating is associated with waterways, such as the Laramie River, and adjacent lands that have a higher diversity of the key characteristics that comprise landscape (see Section 4.2.1). The view is dominated by flat to moderately rolling rangeland in the foreground and middleground with the low horizontal form of the Laramie Mountain Range visible in the background to the east and southeast. The steep slopes and bold form of Boulder Ridge is visible in the background to the south. Low horizontal landforms (or low ridges) that traverse the open rangeland from northeast to southwest are located approximately 5 miles southeast of the viewpoint and limits views of the valley beyond. The vegetation is dominated by low grasses with taller grasses along the Herrick Road and deciduous vegetation and grasses that follow along a drainageway which creates a dark linear band in the foreground. It should be noted that during the field visit (see Section 4.2.3) much of the ground was snow covered, and the snow may have increased the contrast in vegetation. It should also be noted that cloud banks settled over portions of the Laramie Mountains and Boulder Ridge obstructing views of landforms and other features in the background. Human-made modifications include fences, cattle and hay bales associated with ranching operations, rural residential structures and outbuildings, and a utility distribution line that serves local residences. Even though there are some human-made modifications apparent in the view, overall, the visual character is typical of the landscape of the Laramie Basin ecoregion; as such the scenic quality rating is considered common.

View with the Project (Minimum Turbine Height Scenario)

Views toward the Project would be completely screened by a low ridge located approximately 5 miles southeast of the viewpoint. As such, the Project would introduce no visual change.

View with the Project (Maximum Turbine Height Scenario)

Views toward the Project would be completely screened by a low ridge located approximately 5 miles southeast of the viewpoint. As such, the Project would introduce no visual change.

6.1.2.5 Avoidance and Minimization

In general, opportunities to mitigate visual effects for wind projects are limited, given the size and physical characteristics of the wind turbines and the open expanse of the western landscape environment in which they are located. Reducing the turbine height from a 6 MW to 3 MW wind turbine could lessen scale contrast; however, the line, form, texture and color of the wind turbines would remain essentially the same and would still contribute to the overall contrast with the existing landscape. Furthermore, the Project is designed to provide up to approximately 504 MW of electricity, and in order to reach this output, the Project would need to include almost twice as many small wind turbines as large wind turbines. A larger number of shorter turbines may result in greater visual impact than a smaller number of taller turbines. Regardless of the wind turbine

size, wind turbines across each phase would be uniform in size, shape and color. Turbine components would be painted with a light, non-reflective white color in accordance with the Albany County Wind Siting Regulations.

FAA lights on the wind turbines would contribute to their visual effect, as demonstrated in the visual simulations included in Appendix B. These warning lights are a required safety measure; therefore, they cannot be reduced in number or eliminated. However, lighting-related impacts can be minimized by limiting the wind turbine lighting to the minimum time duration allowable by the FAA. Visual effects could be further reduced by implementing a radar-based ADLS. ConnectGen is evaluating the possibility of implementing a radar-based ADLS to turn the aviation obstruction lights on and off in response to detection of aircraft near the wind farm. These systems are intended to reduce the amount of time that the lights are illuminated, thereby potentially minimizing the time that wind turbines are visible at night.

7 APPLICANT-PROPOSED ENVIRONMENTAL PROTECTION MEASURES

ConnectGen has developed EPMs that when implemented would avoid or minimize adverse effects to environmental resources from construction, operations and maintenance, and decommissioning of the Project. The EPMs listed in Table 6 below would both directly and indirectly avoid or reduce potential visual effects from development of the Project.

Table 6: Proposed Environmental Protection Measures Related to Visual Resources for the Rail Tie Wind Project

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
General					
GEN-1	The Project will be designed, constructed, and operated in compliance with Albany County Zoning Regulations (as amended) and Albany County Wind Energy Siting Regulations. Construction and operations activities will comply with all federal, state, and county environmental regulations, as applicable.	X	X	X	X
GEN-3	Construction travel will be restricted to existing roads and permanent or temporary access roads identified in the final Project Site Plan.		X		
GEN-4	The Project will implement speed limits on construction and permanent access roads to minimize potential for fugitive dust, impacts to wildlife, and for safety purposes. Speed limit signs will be posted as appropriate.		X	X	X
Visual Resources					
VIS-1	Collection lines will be buried and collocated with access roads to the extent practicable.	X	X		
VIS-2	The operations and maintenance building will be designed with rural and agricultural architectural elements to minimize contrast with existing structures. The building will be painted with earth-tone colors identified in the Bureau of Land Management (BLM) Standard Environmental Colors palette or as required by Albany County to reduce visual contrasts from color.	X	X	X	
VIS-3	Outdoor facility lighting will be designed with light caps and/or directed downward to minimize offsite glare.	X	X	X	
VIS-4	Turbine components will be painted with a light, non-reflective white color in accordance with the Albany County Wind Siting Regulations (Albany County 2017).	X	X	X	
VIS-5	The Project will follow Federal Aviation Administration (FAA) Obstruction Marking and Lighting requirements as defined by Advisory Circular No 70/7460-1L and will coordinate with the FAA on the feasibility of Aircraft Detection Lighting System (ADLS) to reduce the potential impact of nighttime lighting.	X	X	X	

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FIGURES

Figure 1: Representative Project Layout (3MW)

Figure 2: Representative Project Layout (6MW)

Figure 3: Minimum Turbine Height Scenario Viewshed Analysis

Figure 4: Maximum Turbine Height Scenario Viewshed Analysis

Figure 5: Scenic Quality

Figure 6: KOPs and Photographic Simulation Locations within the Visual Study Area

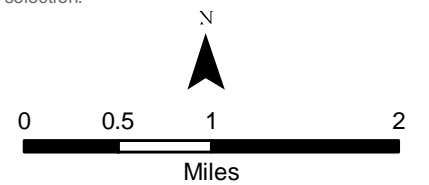
Rail Tie Wind Project

Figure 1 Representative Project Layout (3 MW)

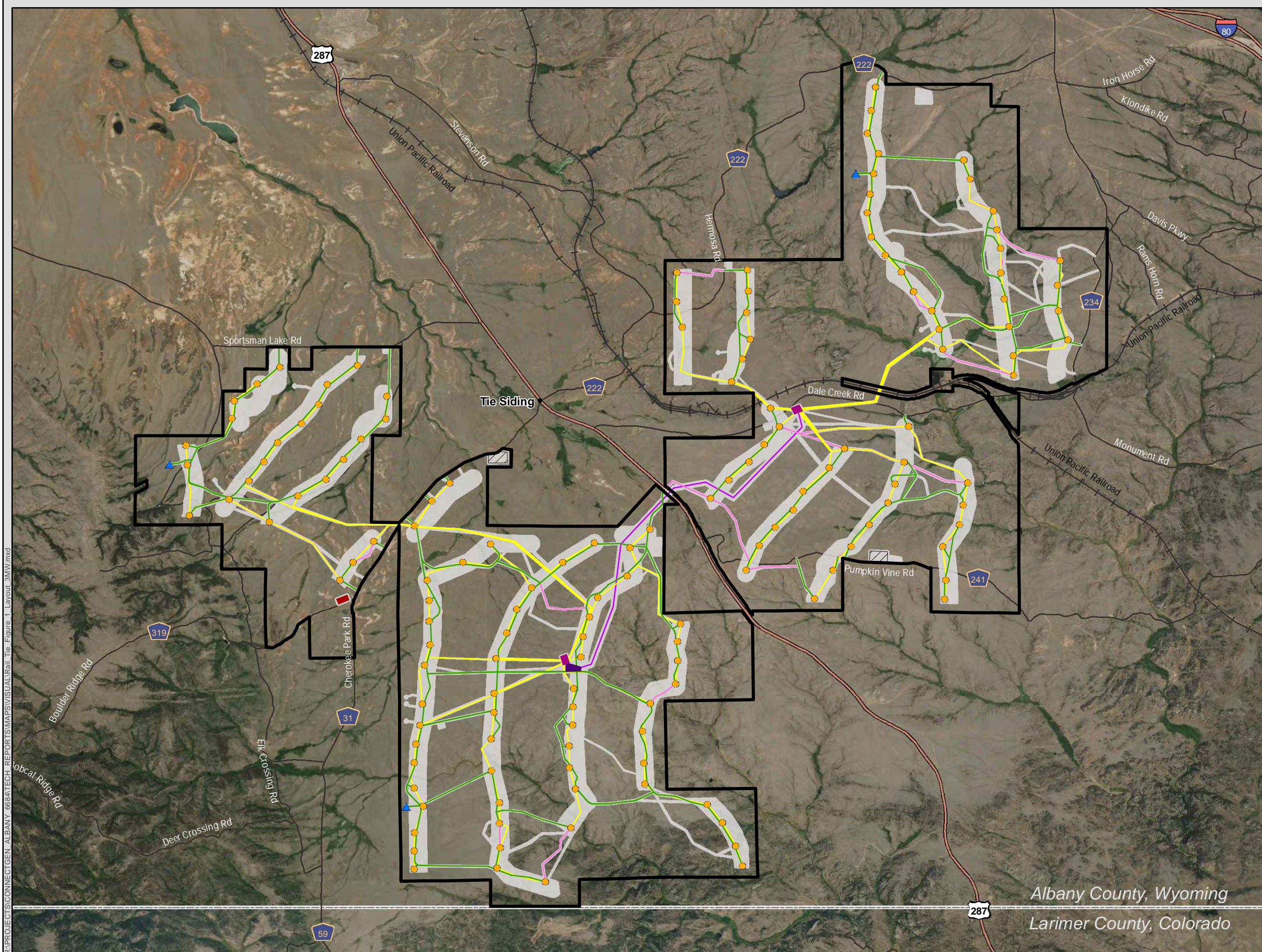
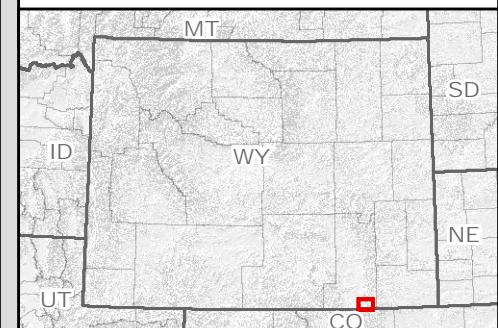
Albany County, WY

- Project Area
- Siting Corridor
- Representative Project Layout**
- Turbine
- Met Tower
- Access Road
- Collection Line
- Crane Path
- Transmission Line
- Project Substation
- Interconnection Substation
- Laydown Yard
- O&M Site
- State/County Boundary
- Highways
- County Roads
- Railroads

NOTE: WTG locations shown in the figure are representative and may change based on final engineering, environmental review and WTG model selection.



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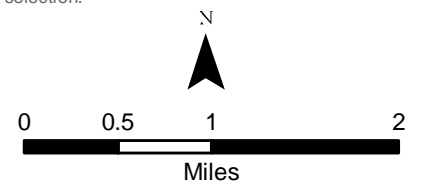
Rail Tie Wind Project

Figure 2 Representative Project Layout (6 MW)

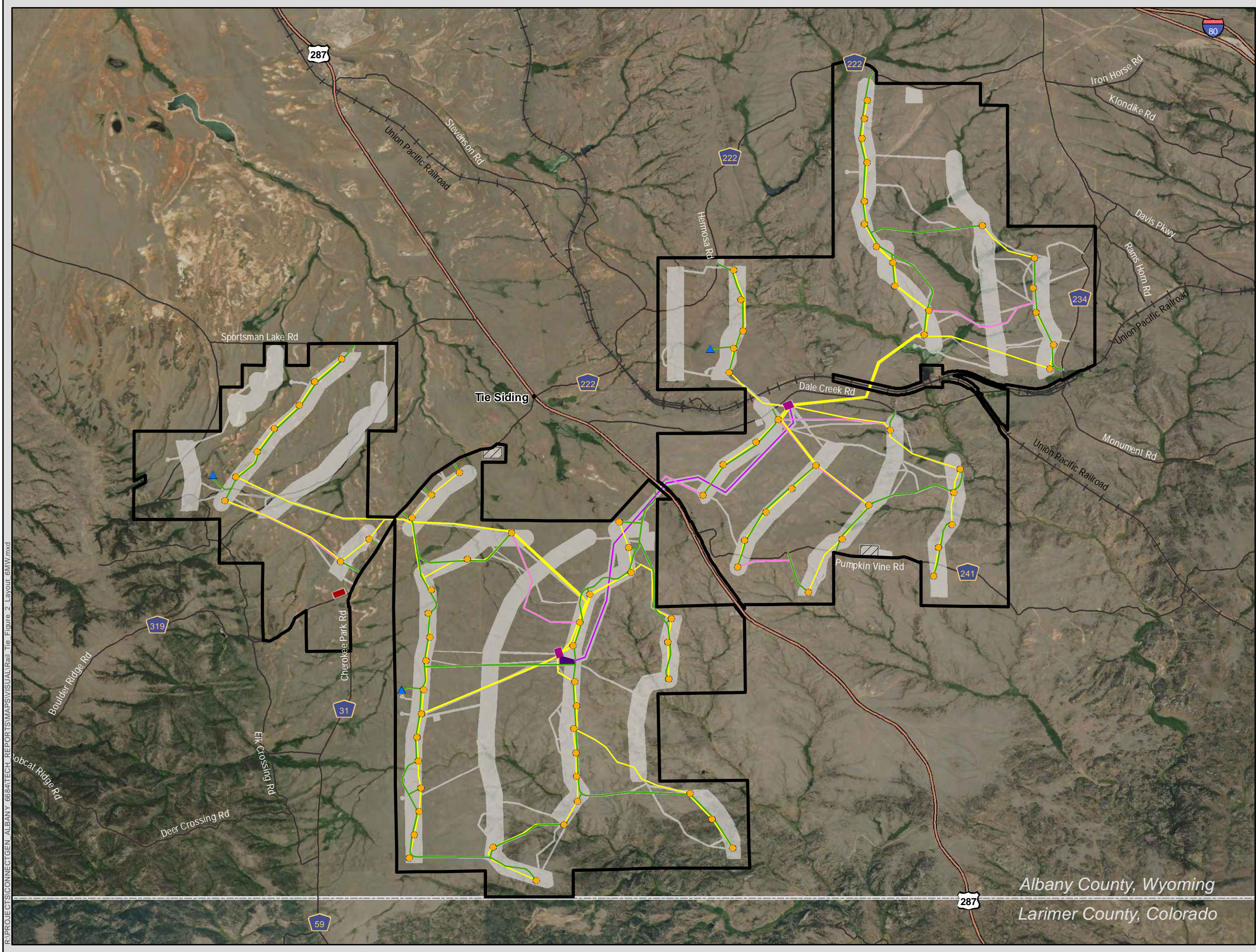
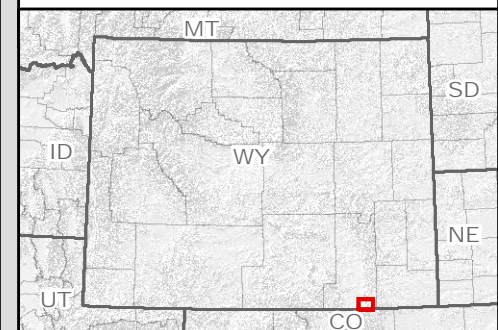
Albany County, WY

- Project Area
- Siting Corridor
- Representative Project Layout**
- Turbine
- Met Tower
- Access Road
- Collection Line
- Crane Path
- Transmission Line
- Project Substation
- Interconnection Substation
- Laydown Yard
- O&M Site
- State/County Boundary
- Highways
- County Roads
- Railroads

NOTE: WTG locations shown in the figure are representative and may change based on final engineering, environmental review and WTG model selection.



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Albany County, Wyoming

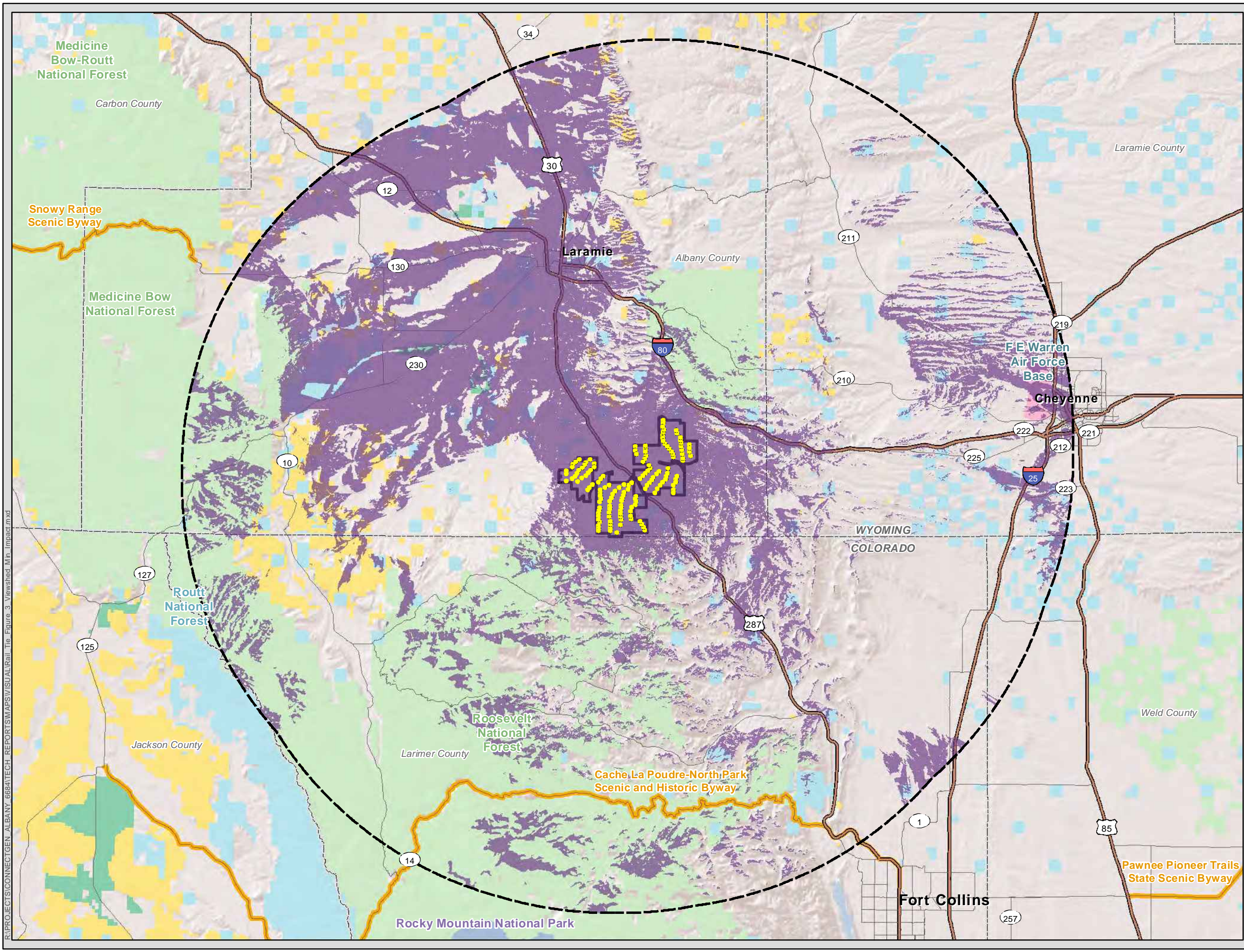
Larimer County, Colorado

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Rail Tie Wind Project

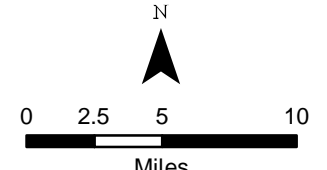
Figure 3
Minimum Turbine Height Scenario
Viewshed Analysis

Albany County, WY

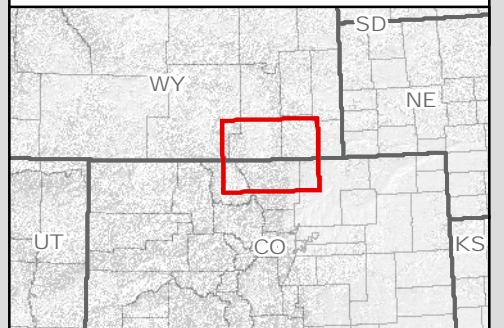


- Project Area
- 30-mile Visual Study Area
- GE 3.0 MW Turbines
- Potentially Visible*
- State/County Boundary
- Scenic Byways
- Highways
- Major Roads
- Department Of Defense (DOD)
- Bureau of Land Management (BLM)
- National Park Service (NPS)
- US Forest Service (USFS)
- US Fish and Wildlife (USFW)
- State Land

*Viewshed analysis assumed bare earth conditions (no vegetation) to evaluate the potential visibility of GE 3.0 MW turbines with a 152.5 meter tip height. Areas that are not shaded in purple indicate that turbines are likely not visible at that location.



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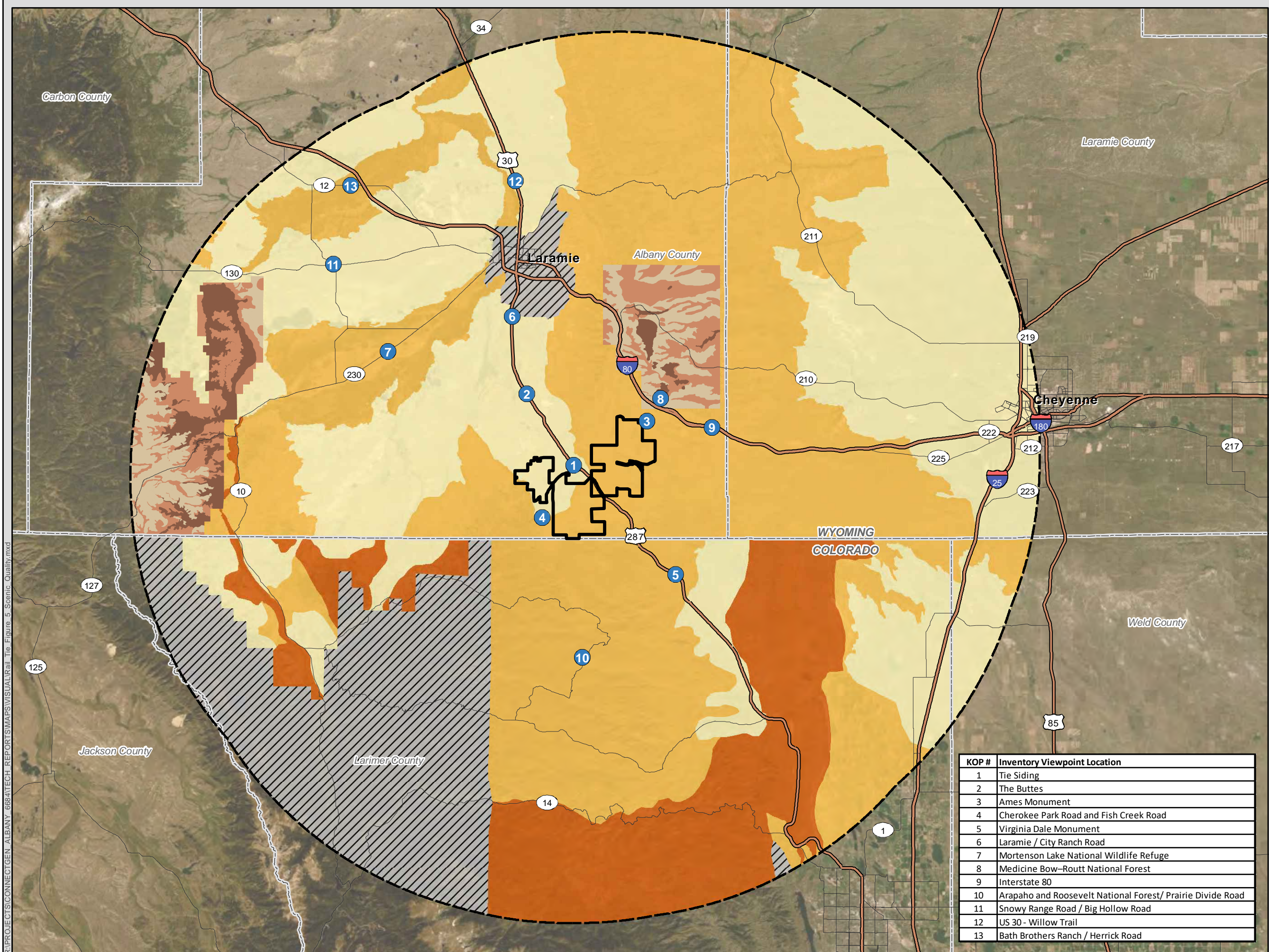


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Rail Tie Wind Project

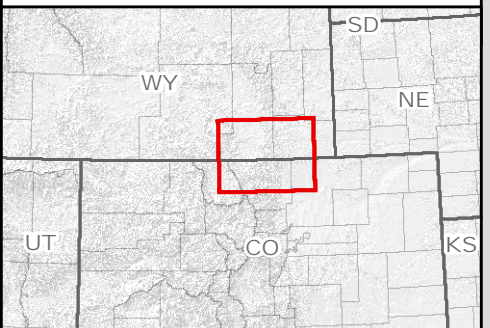
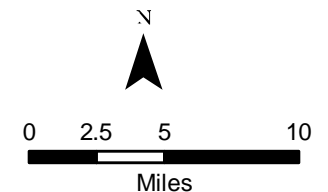
Figure 5 Scenic Quality

Albany County, WY



- Project Area
- 30-mile Visual Study Area
- Key Observation Point (KOP)
- Scenic Quality Rating***
 - Class A: Distinctive
 - Class B: Average or Common
 - Class C: Minimal or Indistinctive
 - N: Not Inventoried
- Scenic Attractiveness Class****
 - Class A: Distinctive
 - Class B: Typical
 - Class C: Indistinctive
- State/County Boundary
- Highways
- Major Roads

*Scenic quality ratings are based on the Bureau of Land Management Visual Resource Management system.
 **Scenic attractiveness classes are based on the U.S. Forest Service Scenic Management System.

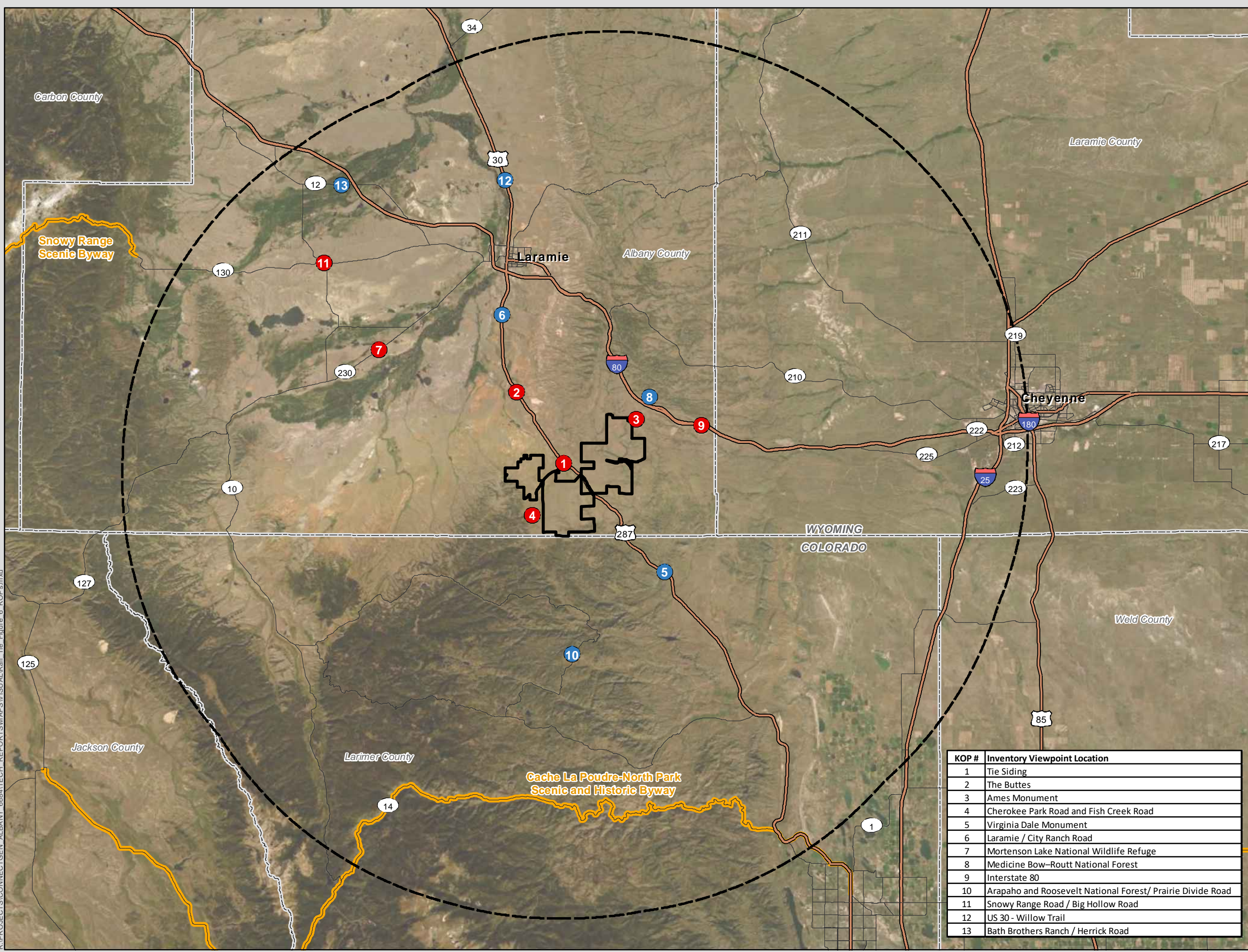


KOP #	Inventory Viewpoint Location
1	Tie Siding
2	The Buttes
3	Ames Monument
4	Cherokee Park Road and Fish Creek Road
5	Virginia Dale Monument
6	Laramie / City Ranch Road
7	Mortenson Lake National Wildlife Refuge
8	Medicine Bow-Routt National Forest
9	Interstate 80
10	Arapaho and Roosevelt National Forest/ Prairie Divide Road
11	Snowy Range Road / Big Hollow Road
12	US 30 - Willow Trail
13	Bath Brothers Ranch / Herrick Road

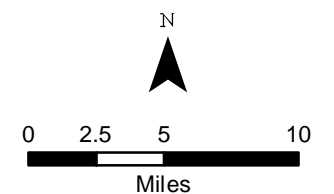
R:\PROJECTS\CONNECTGEN_ALBANY_6684\TECH_REPORTS\MAPS\VISUAL\Rail Tie Figure 5 Scenic Quality.mxd

Rail Tie Wind Project

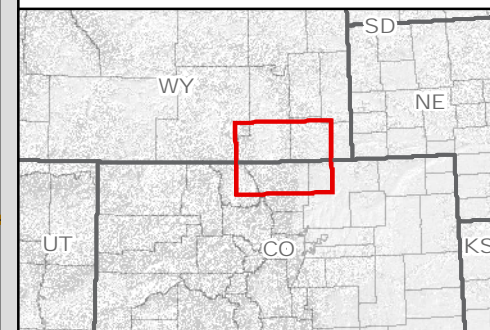
Figure 6
KOPs and Photographic
Simulation Locations
within the Visual Study Area
Albany County, WY



- Project Area
- 30-mile Visual Study Area
- Key Observation Point (KOP)
- Key Observation Point (KOP) Simulation Location
- State/County Boundary
- Scenic Byways
- Highways
- Major Roads



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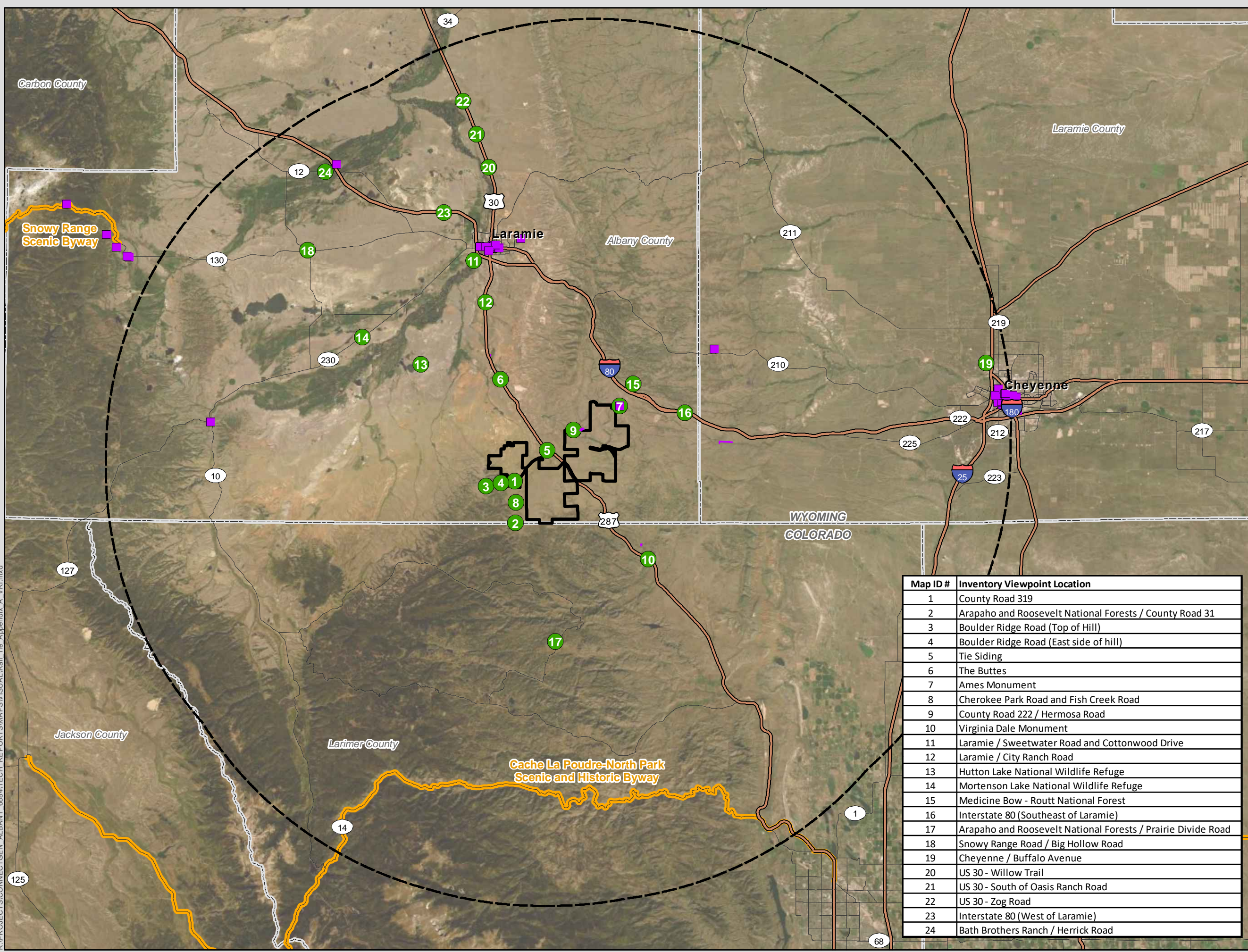
KOP #	Inventory Viewpoint Location
1	Tie Siding
2	The Buttes
3	Ames Monument
4	Cherokee Park Road and Fish Creek Road
5	Virginia Dale Monument
6	Laramie / City Ranch Road
7	Mortenson Lake National Wildlife Refuge
8	Medicine Bow-Routt National Forest
9	Interstate 80
10	Arapaho and Roosevelt National Forest/ Prairie Divide Road
11	Snowy Range Road / Big Hollow Road
12	US 30 - Willow Trail
13	Bath Brothers Ranch / Herrick Road

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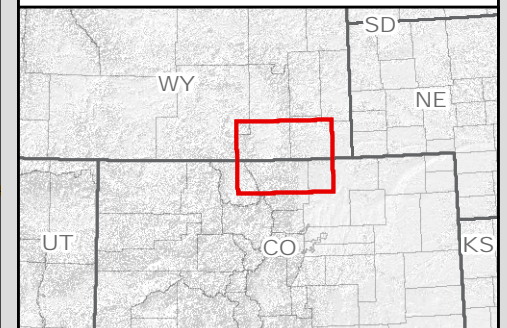
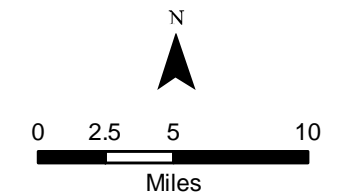
APPENDIX A: Visual Resource Inventory and Site Photographs

Rail Tie Wind Project
 Appendix A
 Visual Resource Inventory
 and Site Photographs
 Albany County, WY

- Project Area
- 30-mile Visual Study Area
- Visual Resource Inventory Point
- Historic Resource
- State/County Boundary
- Scenic Byways
- Highways
- Major Roads



Map ID #	Inventory Viewpoint Location
1	County Road 319
2	Arapaho and Roosevelt National Forests / County Road 31
3	Boulder Ridge Road (Top of Hill)
4	Boulder Ridge Road (East side of hill)
5	Tie Siding
6	The Buttes
7	Ames Monument
8	Cherokee Park Road and Fish Creek Road
9	County Road 222 / Hermosa Road
10	Virginia Dale Monument
11	Laramie / Sweetwater Road and Cottonwood Drive
12	Laramie / City Ranch Road
13	Hutton Lake National Wildlife Refuge
14	Mortenson Lake National Wildlife Refuge
15	Medicine Bow - Routt National Forest
16	Interstate 80 (Southeast of Laramie)
17	Arapaho and Roosevelt National Forests / Prairie Divide Road
18	Snowy Range Road / Big Hollow Road
19	Cheyenne / Buffalo Avenue
20	US 30 - Willow Trail
21	US 30 - South of Oasis Ranch Road
22	US 30 - Zog Road
23	Interstate 80 (West of Laramie)
24	Bath Brothers Ranch / Herrick Road



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Rail Tie Wind Project
 Visual Resource Inventory

Table A-1: Visual Resource Inventory within the Visual Study Area

Inventory ID #	Inventory Viewpoint Location	Resource Type	Distance Zone	Description
1	County Road 319	Travel Route	Foreground/ Middleground	This viewpoint is located along County Road 319 approximately 0.5 miles west of Cherokee Park Road. This viewpoint represents rural residences and daily commuters. From this location, views consist of open grasslands with gently rolling hills in the middleground. The viewpoint is just within the Project Area's western boundary and views toward the Project would be unobstructed.
2	Arapaho and Roosevelt National Forests / County Road 31	Recreation	Foreground/ Middleground	This viewpoint is located along County Road 31 just north of the Colorado/Wyoming border. This viewpoint represents recreationists traveling to/from the national forest and rural residences and daily commuters within the area. From this location, views consist of open grasslands with the Laramie Mountains visible in the background rolling hills in the middleground. The viewpoint is just southwest of the Project Area and views toward the Project would be unobstructed.
3	Boulder Ridge Road (Top of Hill)	Travel Route	Foreground/ Middleground	This viewpoint is located along Boulder Ridge Road (at the top of the hill) approximately 5.5 miles southwest of U.S. Highway 287/Tie Siding. This viewpoint represents travelers. From this elevated position, travelers would have panoramic views of the valley to the east and the Laramie Mountains in the background. Views toward the Project Area would be partially screened by topography and vegetation along the slopes of the ridge.
4	Boulder Ridge Road (East side of hill)	Residential Travel Route	Foreground/ Middleground	This viewpoint is located along Boulder Ridge Road (side of the hill) approximately 4.5 miles southwest of U.S. Highway 287/Tie Siding. This viewpoint represents travelers and rural residences in the area. From this elevated position, travelers would have intermittent views of the valley to the east and the Laramie Mountains in the background. Views toward the Project Area would be partially screened by topography and vegetation along the slopes of the ridge.
5	Tie Siding	Residential Travel Route	Foreground/ Middleground	This viewpoint is located in the unincorporated area of Tie Siding on Hermosa Road/CR 222 just east of U.S. Highway 287, and directly adjacent to the Project area. This viewpoint represents through travelers and daily commuters traveling on U.S. Highway 287 between Laramie and Fort Collins and on local roads such as Hermosa Road/CR 222, as well as rural residences in the Tie Siding area. From this location, views toward the Project Area are open and expansive due to the limited intervening terrain, vegetation and structures.

Rail Tie Wind Project
 Visual Resource Inventory

Inventory ID #	Inventory Viewpoint Location	Resource Type	Distance Zone	Description
6	The Buttes	Residential Travel Route	Background	This viewpoint is located in the unincorporated community of The Buttes on the east side of U.S. Highway 287 approximately 6.5 miles north of Tie Siding. This viewpoint represents rural residences associated with the community as well as travelers along U.S. Highway 287. From this location, views toward the Project Area are open and expansive due to the limited intervening terrain, vegetation and structures.
7	Ames Monument	Historic Site	Foreground/ Middleground	This viewpoint is located at the Ames Monument located near the intersection of Hermosa Road and Monument Road and approximately 1.5 mile south of Interstate 80, and approximately 0.4 mile northeast of the Project area. The monument was listed in the National Register of Historic Places in 1972 and designated a National Historic Landmark in 2016. The monument is maintained as a Wyoming state historic site. From this location, views toward the Project Area are open and expansive due to the elevated position of the viewer and low rolling terrain and lack of vegetation surrounding the site.
8	Cherokee Park Road and Fish Creek Road	Residential Travel Route	Foreground/ Middleground	This viewpoint is located at the intersection of Fish Creek Road and Cherokee Park Road near the base of Boulder Ridge and approximately 1.5 mi north of the Wyoming/Colorado border. This viewpoint represents rural residences along Elk Crossing Road in the Fish Creek Ranch Preserve a private ranch consisting of approximately 4,200 acres on the slopes of Boulder Ridge, as well as through travelers and daily commuters along Cherokee Park Road. From this location, views toward the Project Area are unobstructed due to the relatively flat landscape and lack of vegetation.
9	County Road 222 / Hermosa Road	Travel Route	Foreground/ Middleground	This viewpoint is located along County Road 222/Hermosa Road approximately 2.5 miles east of U.S. Highway 287/Tie Siding. This viewpoint represents daily commuters. From this location, views consist of open grasslands with the Laramie Mountains in the background. The viewpoint is adjacent to the Project Area boundary and views toward the Project would be unobstructed.
10	Virginia Dale Monument	Historic Site	Background	This viewpoint is located in the unincorporated community of Virginia Dale near the intersection of U.S. Highway 287 and North County Road 13F, located approximately 4 mi south of the Wyoming border. Virginia Dale was a famous stop on the Overland Trail. The settlement is memorialized by historical marker located approximately 0.3 mi south of the historic stage stop. This viewpoint represents primarily travelers along U.S. Highway 287 and a historic site. Views toward the Project Area are completely screened by the steep, rugged terrain of the Laramie Mountain Range located directly north of the viewpoint.

Rail Tie Wind Project
 Visual Resource Inventory

Inventory ID #	Inventory Viewpoint Location	Resource Type	Distance Zone	Description
11	Laramie / Sweetwater Road and Cottonwood Drive	Residential	Background	This viewpoint is located at the southern edge of the City of Laramie on City Ranch Road and approximately 400 feet east of U.S. Highway 287. Laramie is a city with a population of approximately 31,000 people according to the 2010 census. This viewpoint represents residences associated with the city of Laramie. From this location, views toward the Project Area are partially screened by development located south of the viewpoint.
12	Laramie / City Ranch Road	Residential	Background	This viewpoint is located at the southern edge of the City of Laramie on City Ranch Road and approximately 400 feet east of U.S. Highway 287. Laramie is a city with a population of approximately 31,000 people according to the 2010 census. This viewpoint represents residences associated with the city of Laramie. From this location, views toward the Project Area are unobstructed due to the relatively flat landscape and lack of vegetation.
13	Hutton Lake National Wildlife Refuge	Recreation	Background	This viewpoint is located near the eastern boundary of the Hutton Lake National Wildlife Refuge along Sand Creek Road approximately 9 miles southwest of Laramie. The refuge is comprised of approximately 1,968 acres and was established for the purpose of providing resting and breeding habitat for migratory birds and other wildlife. According to the U.S. Fish and Wildlife website, the refuge is managed as part of the Arapaho National Wildlife Refuge Complex. Activities within the refuge are limited primarily to wildlife viewing which occurs mostly from March through October. This viewpoint represents recreationists. From this location, views are open and expansive and include open grasslands surrounded by distant mountain ranges. Views toward the Project Area are primarily unobstructed.
14	Mortenson Lake National Wildlife Refuge	Recreation Travel Route	Background	This viewpoint is located on Wyoming Highway 230 along the eastern boundary of the Mortenson Lake National Wildlife Refuge (NWR) and approximately 9 miles southwest of Laramie, Wyoming. The Mortenson Lake NWR encompasses 1,776 acres and consists of four lakes and is managed by the Arapaho NWR in Walden, Colorado. According to the U.S. Fish and Wildlife Service website, the Mortenson Lake NWR is closed to the public due to the endangered status of the Wyoming toad. This viewpoint represents travelers through travelers and daily commuters along Wyoming Highway 230. From this location, views toward the Project Area are unobstructed due to the relatively flat landscape and lack of vegetation.

Rail Tie Wind Project
 Visual Resource Inventory

Inventory ID #	Inventory Viewpoint Location	Resource Type	Distance Zone	Description
15	Medicine Bow - Routt National Forest	Recreation	Foreground/ Middleground	<p>This viewpoint is located within a Medicine Bow-Routt National Forest (NF) campground located along the western slopes of the mountain, approximately 0.7 mi north of Interstate 80 and 4.5 mi west of Buford. The Medicine Bow-Routt National Forest is managed by the U.S. Forest Service. The viewpoint is located in an area of the forest that consists of numerous rock outcroppings. This viewpoint represents recreationists in the area who may be partaking in one of the many activities offered, which include hiking, camping, fishing, sightseeing, wildlife viewing, and rock climbing. From this location, views toward the Project Area are mostly screened by intervening terrain and deciduous and evergreen vegetation surrounding the area.</p>
16	Interstate 80 (Southeast of Laramie)	Travel Route	Foreground/ Middleground	<p>This viewpoint is located along Interstate 80 near Exit 335 in Buford, an unincorporated community approximately 17 mi southeast of Laramie. Interstate 80 is an east-west transcontinental freeway that traverses across the southern portion of Wyoming. In Wyoming, the highest point along the highway is near Buford. The highway is a major transportation corridor and consists primarily of through-travelers. From this location, views toward the Project Area are partially screened by intervening terrain in the middleground.</p>
17	Arapaho and Roosevelt National Forests / Prairie Divide Road	Recreation Travel Route	Background	<p>This viewpoint is located within the Arapaho and Roosevelt National Forest, along Prairie Divide Road, approximately 10 miles west of U.S. Highway 287 and 9 miles south of the Colorado/Wyoming border. The viewpoint represents daily commuters on local roads and rural residences in the area. Views toward the Project Area are completely screened by the steep, rugged terrain of the Laramie Mountain Range located directly north of the viewpoint.</p>
18	Snowy Range Road / Big Hollow Road	Travel Route	Seldom Seen	<p>This viewpoint is located on Big Hollow Road just south of Snowy Ridge Road approximately 12 mi west of Laramie, Wyoming. The highway is an alternative route to Interstate 80 that go through the Snowy Range Mountains. A portion of the Snowy Range Road is designated as a scenic byway; however, the scenic designated portion begins in Centennial, Wyoming located approximately 9 mi west of the visual study area boundary . Through travelers and commuters are the most likely users along this travel route. From this location, views toward the Project Area are open and expansive due to the elevated position of the viewer and low rolling terrain and lack of vegetation surrounding the highway.</p>

Rail Tie Wind Project
Visual Resource Inventory

Inventory ID #	Inventory Viewpoint Location	Resource Type	Distance Zone	Description
19	Cheyenne / Buffalo Avenue	Residential	Seldom Seen	This viewpoint is located on the western edge of the City of Cheyenne, in a residential community that borders the Francis E. Warren Air Force Base to the east. Cheyenne is a city with a population of approximately 60,000 people according to the 2010 census. This viewpoint represents residences associated with the city of Cheyenne. This viewpoint is located in the seldom seen distance zone and views toward the Project Area are completely screened by intervening terrain, including the Laramie Mountain Range located to the west of the viewpoint.
20	US 30 - Willow Trail	Travel Route	Seldom Seen	This viewpoint is located along U.S. Highway 30 near Willow Trail approximately 4.5 miles north of Laramie, Wyoming. Travelers along U.S. Highway 30 consist of through travelers and daily commuters. Views from this location are at a slightly elevated point along the highway which allows for open expansive views toward the Project Area. However, intervening terrain in the middleground would most likely screen a portion of the Project Area.
21	US 30 - South of Oasis Ranch Road	Travel Route	Seldom Seen	This viewpoint is located along U.S. Highway 30 near Willow Trail approximately 8 miles north of Laramie, Wyoming. Travelers along U.S. Highway 30 consist of through travelers and daily commuters. Views from this location consist of open rangeland with the Laramie Mountains visible to the east. Views toward the Project Area may be partially screened by intervening terrain, development associated with Laramie and vegetation located southwest and west of the viewpoint.
22	US 30 - Zog Road	Travel Route	Seldom Seen	This viewpoint is located along U.S. Highway 30 near Zog Road approximately 10 miles north of Laramie, Wyoming. Travelers along U.S. Highway 30 consist of through travelers and daily commuters. Views from this location consist of open rangeland with the Laramie Mountains visible to the east. Views toward the Project Area may be partially screened by intervening terrain located southwest of the viewpoint.
23	Interstate 80 (West of Laramie)	Travel Route	Seldom Seen	This viewpoint is located along Interstate 80 at a parking area approximately 2.5 miles west of the City of Laramie. Interstate 80 is an east-west transcontinental freeway that traverses across the southern portion of Wyoming. The highway is a major transportation corridor and consists primarily of through-travelers. From this location, views are primarily open and expansive due to grasslands surrounding the viewpoint. Structures and vegetation in the middleground and background may screen some portions of the Project Area.

Rail Tie Wind Project
 Visual Resource Inventory

Inventory ID #	Inventory Viewpoint Location	Resource Type	Distance Zone	Description
24	Bath Brothers Ranch / Herrick Road	Historic Site Residential	Seldom Seen	<p>This viewpoint is located near Bath Brothers Ranch on Herrick Road approximately one mile west of Interstate 80. The ranch is one of the first ones established in Albany County, Wyoming. The ranch, which consists of a stone house and barn was established around 1870. The ranch was listed in the NRHP in 1985. The ranch is privately owned and currently used for horse breeding. This viewpoint represents travelers along a local roadway and rural residences, including Bath Brothers Ranch which also represents a historic site. From this location, are primarily open and expansive due to low rolling terrain and minimal vegetation surrounding the location. However, there is a small rise/ridge in the middleground that may screen views of the Project Area.</p>

Notes:
 a/ Distance Zones are based on the Bureau of Land Management Visual Resource Management methodology and are categorized as foreground/middleground (0-5 miles), background (5-15 miles) and seldom seen (15 miles or greater).



1. County Road 319 - Views looking northeast - east



2. Arapaho and Roosevelt National Forests / County Road 31 - Views looking northeast



3. Boulder Ridge Road (Top of Hill) - Views looking northeast-east



4. Boulder Ridge Road (East side of hill)- Views looking east



5. Tie Siding - Views looking southwest



6. The Buttes - Views looking south



7. Ames Monument - Views looking southwest



8. Cherokee Park Road and Fish Creek Road - Views looking east



9. County Road 222 / Hermosa Road - Views looking south



10. Virginia Dale Monument - Views looking northwest



11. Laramie / Sweetwater Road and Cottonwood Drive - Views looking south-southeast



12. Laramie / City Ranch Road - Views looking south-southeast



13. Hutton Lake National Wildlife Refuge - Views looking southeast



14. Mortenson Lake National Wildlife Refuge - Views looking southeast



15. Medicine Bow - Routt National Forest - Views looking southwest



16. Interstate 80 (Southeast of Laramie) - Views looking southwest



17. Arapaho and Roosevelt National Forests / Prairie Divide Road - Views looking north



18. Snowy Range Road / Big Hollow Road - Views looking southeast



19. Cheyenne / Buffalo Avenue (west side of town) - Views looking southwest



20. US 30 / Willow Trail - Views looking south-southwest



21. US 30 / South of Oasis Ranch Road - Views looking south-southwest



22. US 30 / Zog Road - Views looking south-southwest



23. Interstate 80 (West of Laramie) - Views looking south-southeast



24. Bath Brothers Ranch / Herrick Lane - Views looking southeast

APPENDIX B: Photographic Simulations

Visual Simulations

KOP001 Tie Siding

Early Afternoon

GE 3.0MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	191120_DSC_0887_MAX_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	1:28 PM
Latitude	41.080677°
Longitude	-105.507013°
Ground Elevation + Tripod Height	2350m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

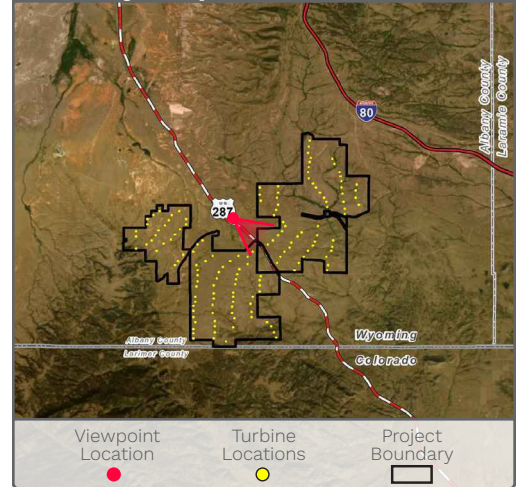
Sun Angle/Azimuth	191°
Sun Elevation	47°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	149
Make and Model	GE 3.0MW
Upper Blade Tip Height	152.5m
Lower Blade Tip Height	31m
Indicative Hub Height	89m
Rotor Diameter	127m

Vicinity Map



Viewing Instructions

The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP001 Tie Siding
Early Afternoon, viewing Southeast
GE 3.0MW, Minimum Turbine Height Scenario

Visual Simulations

KOP001 Tie Siding

Early Afternoon

Vestas V162-5.6MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	191120_DSC_0887_MAX_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	1:28 PM
Latitude	41.080677°
Longitude	-105.507013°
Ground Elevation + Tripod Height	2350m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

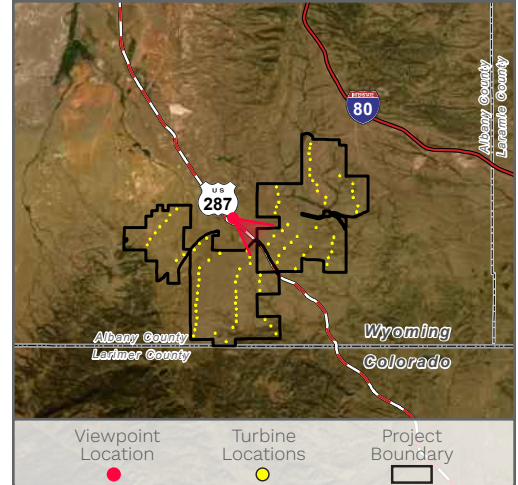
Sun Angle/Azimuth	191°
Sun Elevation	47°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	87
Make and Model	Vestas V162-5.6MW
Upper Blade Tip Height	206m
Lower Blade Tip Height	44m
Indicative Hub Height	125m
Rotor Diameter	162m

Vicinity Map



Viewing Instructions

The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP001 Tie Siding
Early Afternoon, viewing Southeast

Vestas V162-5.6MW, Maximum Turbine Height Scenario

Visual Simulations

KOP002 The Buttes - Hwy 287

Late Afternoon

GE 3.0MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200508_DSC_0534_MIN_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	5:02 PM
Latitude	41.160938°
Longitude	-105.577750°
Ground Elevation + Tripod Height	2248m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

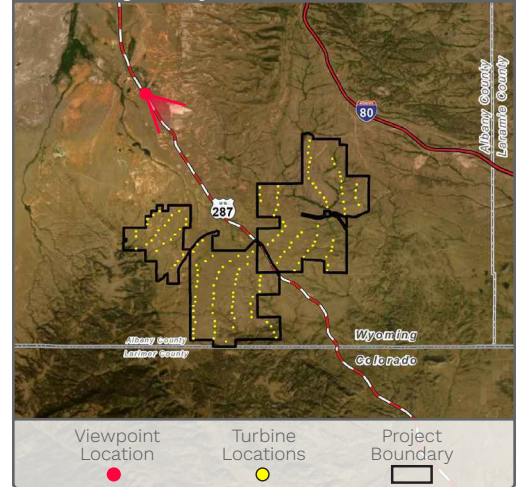
Sun Angle/Azimuth	249°
Sun Elevation	20°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	149
Make and Model	GE 3.0MW
Upper Blade Tip Height	152.5m
Lower Blade Tip Height	31m
Indicative Hub Height	89m
Rotor Diameter	127m

Vicinity Map



Viewing Instructions

The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP002 The Buttes - Hwy 287
Late Afternoon, viewing Southeast

GE 3.0MW, Minimum Turbine Height Scenario

Visual Simulations

KOP002 The Buttes - Hwy 287

Late Afternoon

Vestas V162-5.6MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	191130_DSC_0534_MAX_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	5:02 PM
Latitude	41.160938°
Longitude	-105.577750°
Ground Elevation + Tripod Height	2248m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

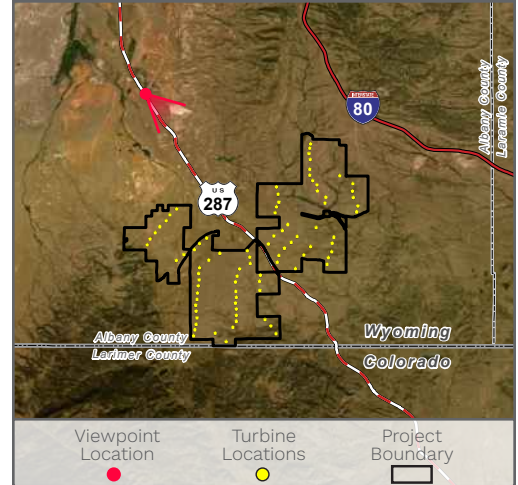
Sun Angle/Azimuth	249°
Sun Elevation	20°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	87
Make and Model	Vestas V162-5.6MW
Upper Blade Tip Height	206m
Lower Blade Tip Height	44m
Indicative Hub Height	125m
Rotor Diameter	162m

Vicinity Map



Viewing Instructions

The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP002 The Buttes - Hwy 287

Late Afternoon, viewing Southeast

Vestas V162-5.6MW, Maximum Turbine Height Scenario

Visual Simulations

KOP002 The Buttes - Hwy 287

Night (Computer Generated)

GE 3.0MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200508_DSC_0534_MIN_Night.JPG
Date of Photograph	09/25/19
Time of Photograph	Night (Computer Generated)
Latitude	41.160938°
Longitude	-105.577750°
Ground Elevation + Tripod Height	2248m
Photograph Settings	Simulated

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

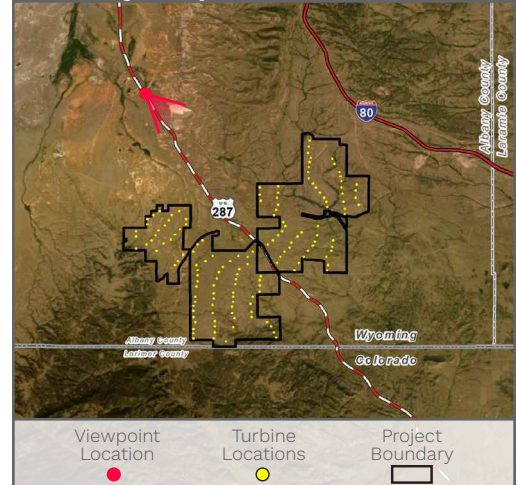
Sun Angle/Azimuth	n/a
Sun Elevation	n/a
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	149
Make and Model	GE 3.0MW
Upper Blade Tip Height	152.5m
Lower Blade Tip Height	31m
Indicative Hub Height	25.5m
Rotor Diameter	127m

Vicinity Map



Viewing Instructions

The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP002 The Buttes - Hwy 287
Night (Computer Generated), viewing Southeast
GE 3.0MW, Minimum Turbine Height Scenario

Visual Simulations

KOP002 The Buttes - Hwy 287

Night (Computer Generated)

Vestas V162-5.6MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	191130_DSC_0534_MAX_Night.JPG
Date of Photograph	09/25/19
Time of Photograph	Night (Computer Generated)
Latitude	41.160938°
Longitude	-105.577750°
Ground Elevation + Tripod Height	2248m
Photograph Settings	Simulated

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

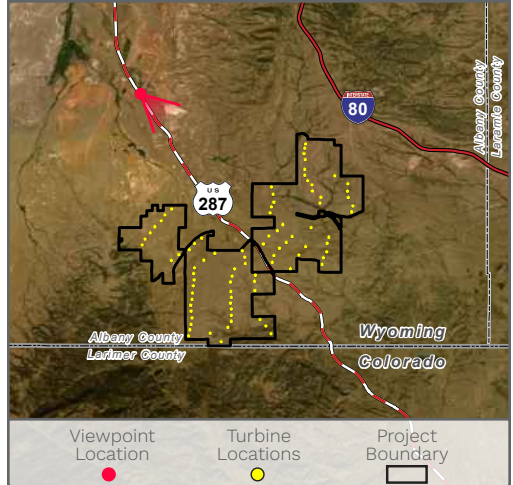
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Sun Elevation	n/a
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	87
Make and Model	Vestas V162-5.6MW
Upper Blade Tip Height	206m
Lower Blade Tip Height	44m
Indicative Hub Height	125m
Rotor Diameter	162m

Vicinity Map



Viewing Instructions

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If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition





KOP002 The Buttes - Hwy 287
Night (Computer Generated), viewing Southeast
Vestas V162-5.6MW, Maximum Turbine Height Scenario

Visual Simulations

KOP003 Ames Monument

Midday

GE 3.0MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200212_DSC_0074_MIN_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	12:20 PM
Latitude	41.130981°
Longitude	-105.398247°
Ground Elevation + Tripod Height	2525m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

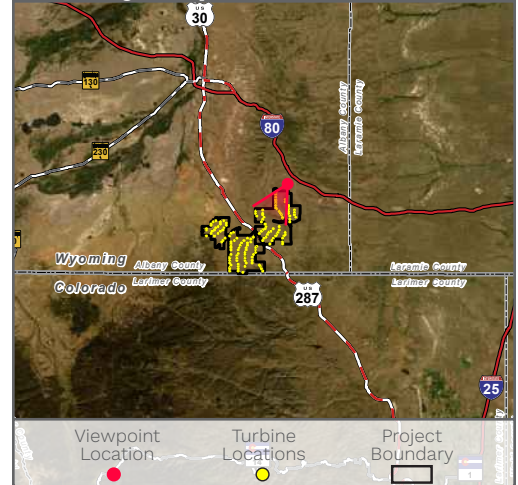
Sun Angle/Azimuth	168°
Sun Elevation	47°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	149
Make and Model	GE 3.0MW
Upper Blade Tip Height	152.5m
Lower Blade Tip Height	31m
Indicative Hub Height	89m
Rotor Diameter	127m

Vicinity Map



Viewing Instructions

The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP003 Ames Monument
Midday, viewing Southwest

GE 3.0MW, Minimum Turbine Height Scenario

Visual Simulations

KOP003 Ames Monument

Midday

Vestas V162-5.6MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200212_DSC_0074_MIN_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	12:20 PM
Latitude	41.130981°
Longitude	-105.398247°
Ground Elevation + Tripod Height	2525m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

Sun Angle/Azimuth	168°
Sun Elevation	47°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	87
Make and Model	Vestas V162-5.6MW
Upper Blade Tip Height	206m
Lower Blade Tip Height	44m
Indicative Hub Height	125m
Rotor Diameter	162m

Vicinity Map



Viewing Instructions

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If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP003 Ames Monument

Midday, viewing Southwest

Vestas V162-5.6MW, Maximum Turbine Height Scenario

Visual Simulations

KOP004 Cherokee Park Rd/Fish Creek Rd

Afternoon

GE 3.0MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200508_DSC_0474_MIN_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	2:40 PM
Latitude	41.021381°
Longitude	-105.553658°
Ground Elevation + Tripod Height	2444m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

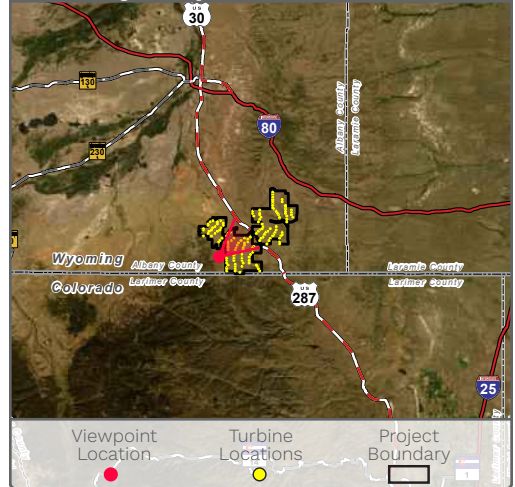
Sun Angle/Azimuth	245°
Sun Elevation	23°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	149
Make and Model	GE 3.0MW
Upper Blade Tip Height	152.5m
Lower Blade Tip Height	31m
Indicative Hub Height	89m
Rotor Diameter	127m

Vicinity Map



Viewing Instructions

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Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP004 Cherokee Park Rd/Fish Creek Rd
Afternoon, viewing Northeast

GE 3.0MW, Minimum Turbine Height Scenario

Visual Simulations

KOP004 Cherokee Park Rd/Fish Creek Rd

Afternoon

Vestas V162-5.6MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200508_DSC_0474_MAX_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	2:40 PM
Latitude	41.021381°
Longitude	-105.553658°
Ground Elevation + Tripod Height	2444m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

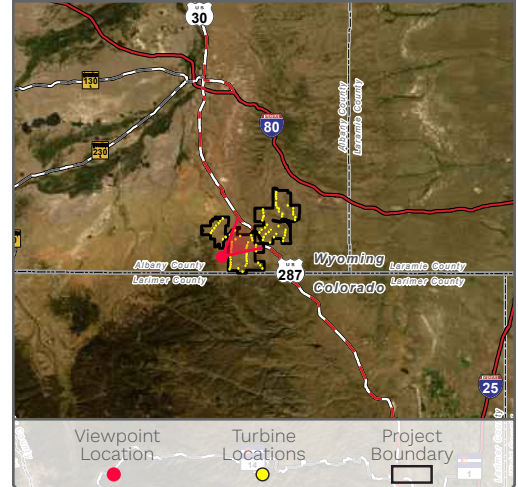
Sun Angle/Azimuth	245°
Sun Elevation	23°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	87
Make and Model	Vestas V162-5.6MW
Upper Blade Tip Height	206m
Lower Blade Tip Height	44m
Indicative Hub Height	125m
Rotor Diameter	162m

Vicinity Map



Viewing Instructions

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Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP004 Cherokee Park Rd/Fish Creek Rd

Afternoon, viewing Northeast

Vestas V162-5.6MW, Maximum Turbine Height Scenario

Visual Simulations

KOP007 Mortenson Lake NWR

Afternoon

GE 3.0MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200508_DSC_0650_MIN_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	4:10 PM
Latitude	41.207978°
Longitude	-105.785748°
Ground Elevation + Tripod Height	2218m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

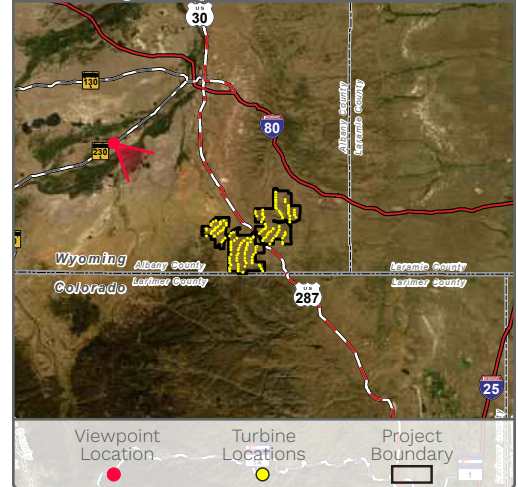
Sun Angle/Azimuth	239°
Sun Elevation	28°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	149
Make and Model	GE 3.0MW
Upper Blade Tip Height	152.5m
Lower Blade Tip Height	31m
Indicative Hub Height	89m
Rotor Diameter	127m

Vicinity Map



Viewing Instructions

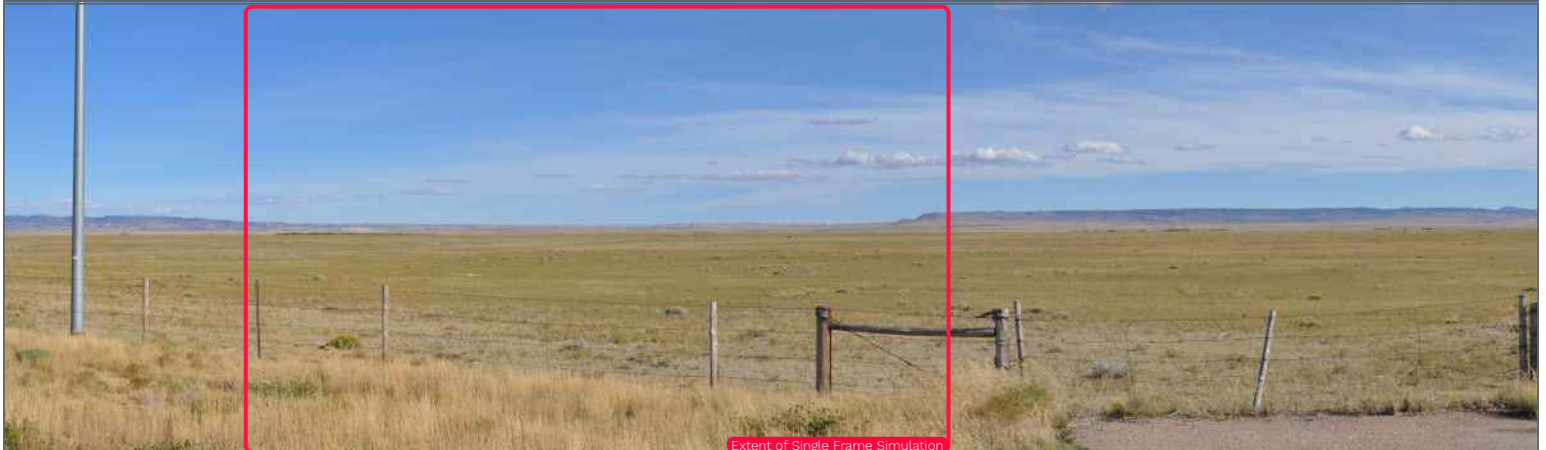
The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP007 Mortenson Lake NWR
Afternoon, viewing Southeast
GE 3.0MW, Minimum Turbine Height Scenario

Visual Simulations

KOP007 Mortenson Lake NWR

Afternoon

Vestas V162-5.6MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200109_DSC_0650_MAX_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	4:10 PM
Latitude	41.207978°
Longitude	-105.785748°
Ground Elevation + Tripod Height	2218m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

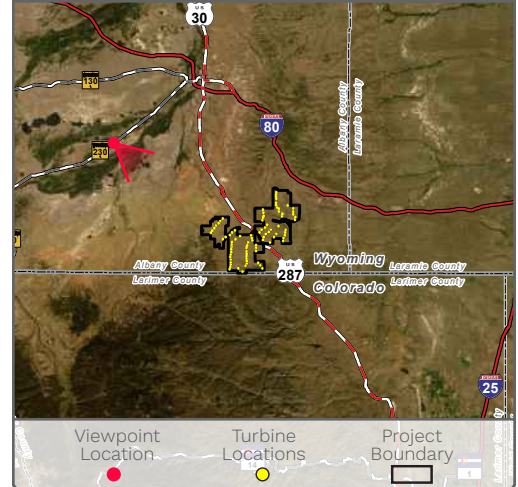
Sun Angle/Azimuth	239°
Sun Elevation	28°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	87
Make and Model	Vestas V162-5.6MW
Upper Blade Tip Height	206m
Lower Blade Tip Height	44m
Indicative Hub Height	125m
Rotor Diameter	162m

Vicinity Map



Viewing Instructions

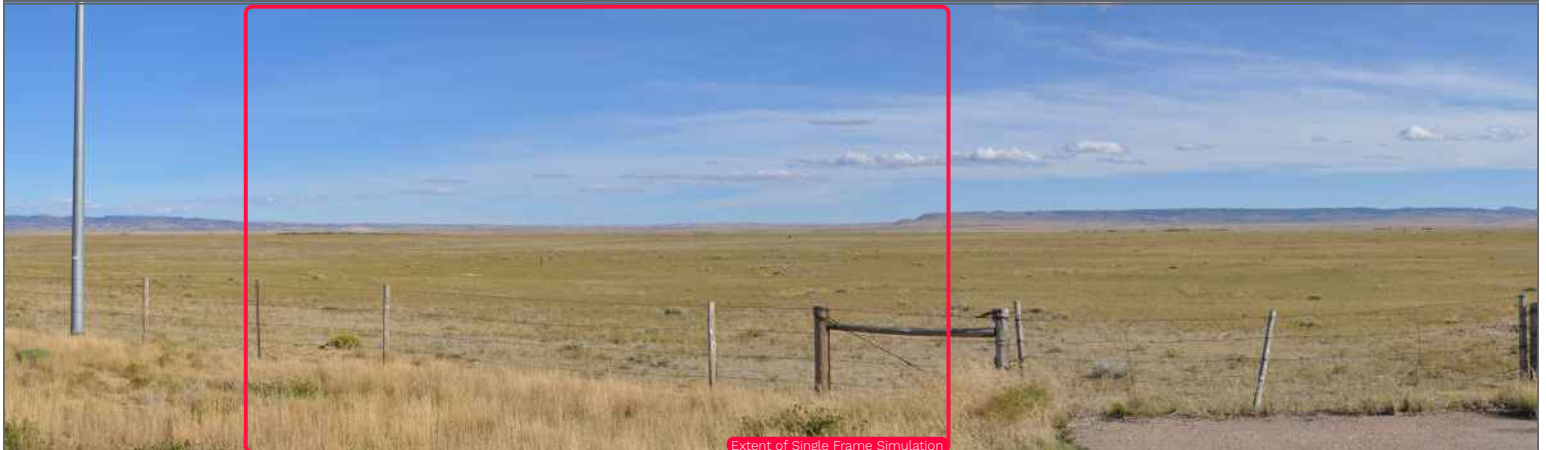
The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP007 Mortenson Lake NWR

Afternoon, viewing Southeast

Vestas V162-5.6MW, Maximum Turbine Height Scenario

Visual Simulations

KOP009 I-80

Morning
GE 3.0MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200508_DSC_0792_MIN_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	10:18 AM
Latitude	41.123830°
Longitude	-105.300564°
Ground Elevation + Tripod Height	2404m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

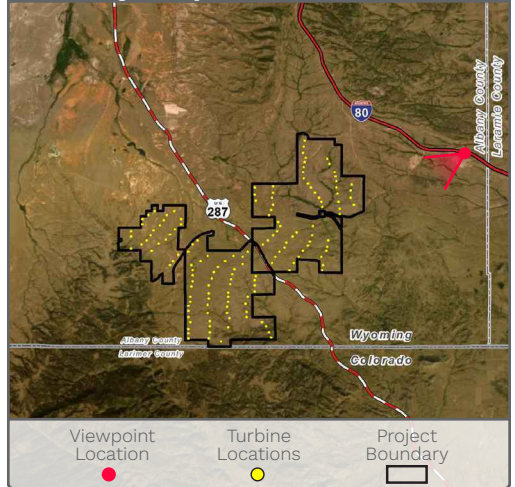
Sun Angle/Azimuth	131°
Sun Elevation	36°
Weather Conditions	Clear

Wind Turbine Information



Number of Turbines	149
Make and Model	GE 3.0MW
Upper Blade Tip Height	152.5m
Lower Blade Tip Height	31m
Indicative Hub Height	89m
Rotor Diameter	127m

Vicinity Map



Viewing Instructions

The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP009 I-80

Morning, viewing Southwest

GE 3.0MW, Minimum Turbine Height Scenario

Visual Simulations

KOP009 I-80

Morning

Vestas V162-5.6MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	191130_DSC_0792_MAX_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	10:18 AM
Latitude	41.123830°
Longitude	-105.300564°
Ground Elevation + Tripod Height	2404m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

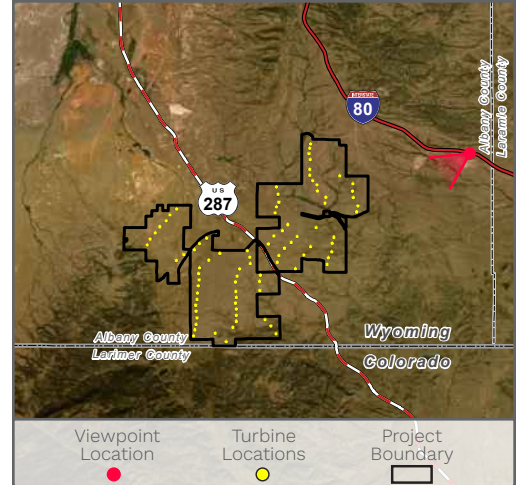
Sun Angle/Azimuth	131°
Sun Elevation	36°
Weather Conditions	Clear

Wind Turbine Information



Number of Turbines	87
Make and Model	Vestas V162-5.6MW
Upper Blade Tip Height	206m
Lower Blade Tip Height	44m
Indicative Hub Height	125m
Rotor Diameter	162m

Vicinity Map



Viewing Instructions

The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP009 I-80

Morning, viewing Southwest

Vestas V162-5.6MW, Maximum Turbine Height Scenario

Visual Simulations

KOP011 Snowy Range Scenic Byway

Afternoon

GE 3.0MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200508_DSC_0768_MIN_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	5:50 PM
Latitude	41.306350°
Longitude	-105.869059°
Ground Elevation + Tripod Height	2304m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

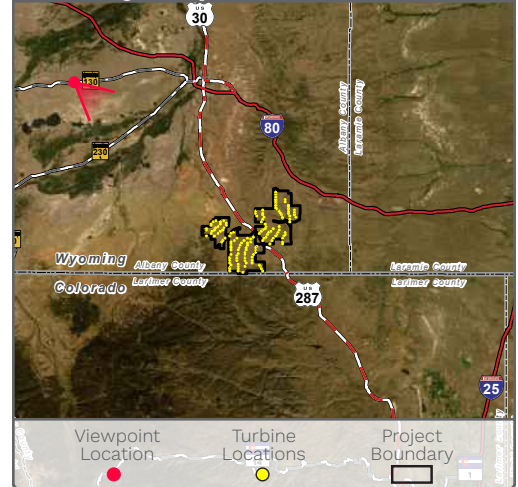
Sun Angle/Azimuth	258°
Sun Elevation	11°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	149
Make and Model	GE 3.0MW
Upper Blade Tip Height	152.5m
Lower Blade Tip Height	31m
Indicative Hub Height	89m
Rotor Diameter	127m

Vicinity Map



Viewing Instructions

The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP011 Snowy Range Scenic Byway
Afternoon, viewing Southeast

GE 3.0MW, Minimum Turbine Height Scenario

Visual Simulations

KOP011 Snowy Range Scenic Byway

Afternoon

Vestas V162-5.6MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200113_DSC_0768_MAX_Sim.JPG
Date of Photograph	09/25/19
Time of Photograph	5:50 PM
Latitude	41.306350°
Longitude	-105.869059°
Ground Elevation + Tripod Height	2304m
Photograph Settings	ISO 200 1/400sec. f/10

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

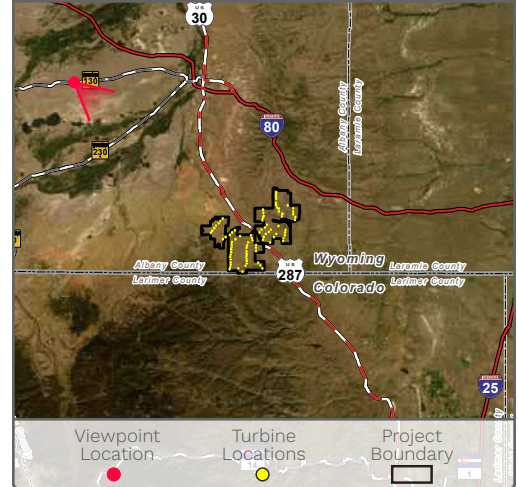
Sun Angle/Azimuth	258°
Sun Elevation	11°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	87
Make and Model	Vestas V162-5.6MW
Upper Blade Tip Height	206m
Lower Blade Tip Height	44m
Indicative Hub Height	125m
Rotor Diameter	162m

Vicinity Map



Viewing Instructions

The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP011 Snowy Range Scenic Byway
Afternoon, viewing Southeast

Vestas V162-5.6MW, Maximum Turbine Height Scenario

Visual Simulations

KOP011 Snowy Range Scenic Byway Night (Computer Generated)

GE 3.0MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200508_DSC_0768_MIN_Night.JPG
Date of Photograph	09/25/19
Time of Photograph	Night (Computer Generated)
Latitude	41.306350°
Longitude	-105.869059°
Ground Elevation + Tripod Height	2304m
Photograph Settings	Simulated

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

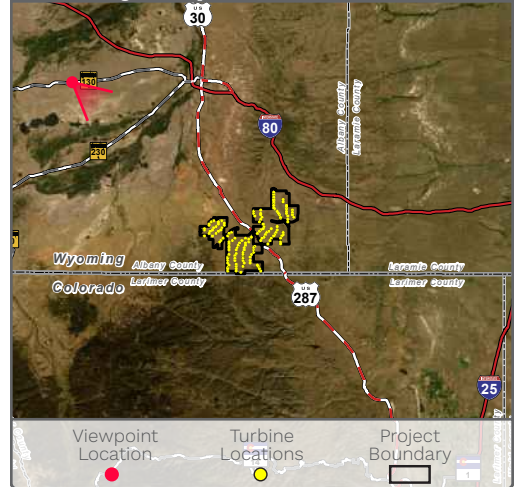
Sun Angle/Azimuth	258°
Sun Elevation	11°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	149
Make and Model	GE 3.0MW
Upper Blade Tip Height	152.5m
Lower Blade Tip Height	31m
Indicative Hub Height	25.5m
Rotor Diameter	127m

Vicinity Map



Viewing Instructions

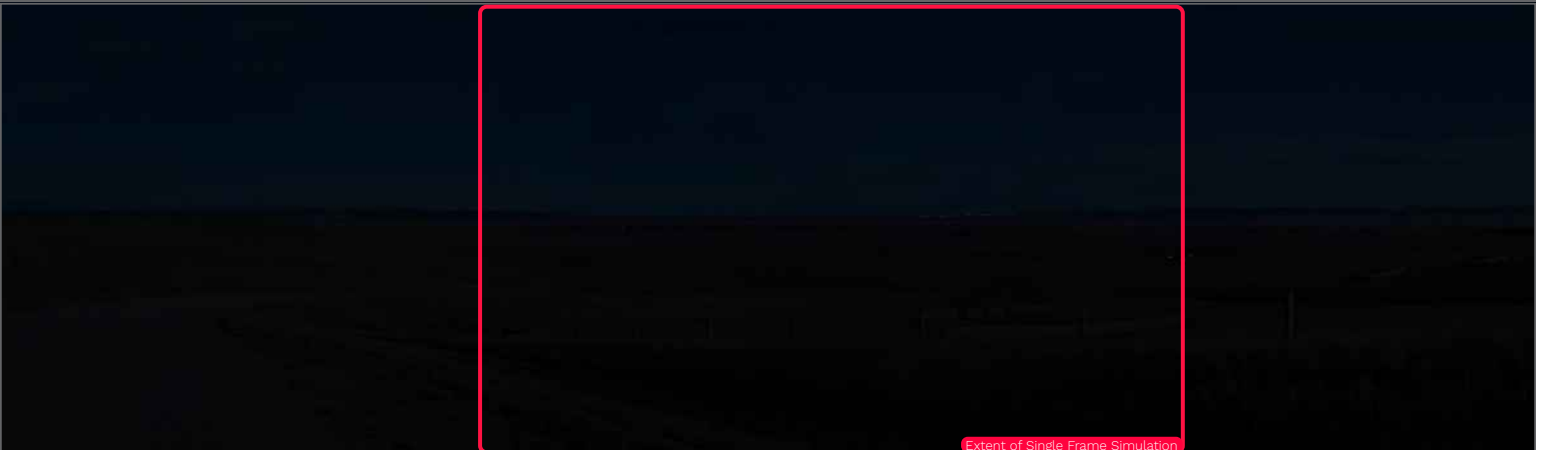
The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition



Extent of Single Frame Simulation



KOP011 Snowy Range Scenic Byway
Night (Computer Generated), viewing Southeast
GE 3.0MW, Minimum Turbine Height Scenario

Visual Simulations

KOP011 Snowy Range Scenic Byway Night (Computer Generated)

Vestas V162-5.6MW



Rail Tie Wind Project

Simulation Data

Photograph Information

Photo Name	200113_DSC_0768_MAX_Night.JPG
Date of Photograph	09/25/19
Time of Photograph	Night (Computer Generated)
Latitude	41.306350°
Longitude	-105.869059°
Ground Elevation + Tripod Height	2304m
Photograph Settings	Simulated

Camera Specifications

Camera Make and Model	Nikon D90
Sensor Size	Nikon APS-C (23.6x15.8mm)
Lens Make and Model	AF-S DX NIKKOR 35mm f/1.8G
Lens Focal Length	35mm prime
35mm Equivalent Focal Length	53.55mm

Sun and Weather Information

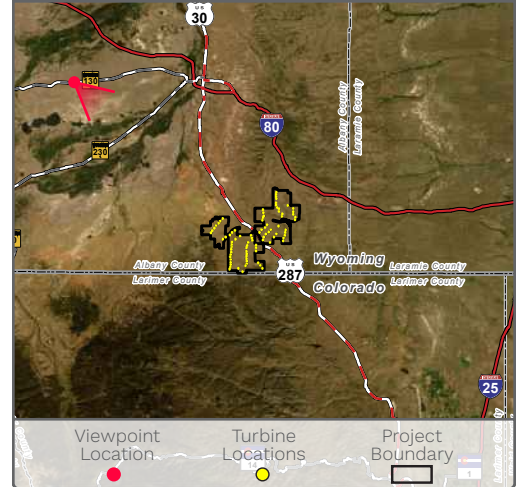
Sun Angle/Azimuth	258°
Sun Elevation	11°
Weather Conditions	Partly Cloudy

Wind Turbine Information



Number of Turbines	87
Make and Model	Vestas V162-5.6MW
Upper Blade Tip Height	206m
Lower Blade Tip Height	44m
Indicative Hub Height	125m
Rotor Diameter	162m

Vicinity Map



Viewing Instructions

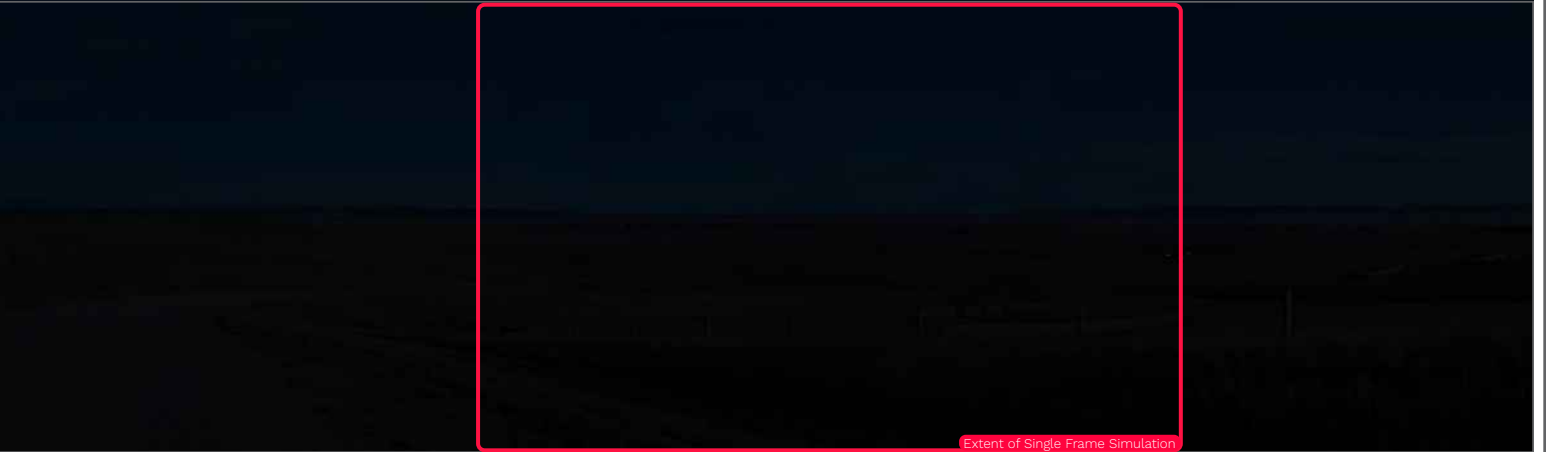
The single-frame simulation on the following page should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Panoramic Existing Condition



Panoramic Simulated Condition





KOP011 Snowy Range Scenic Byway
Night (Computer Generated), viewing Southeast
Vestas V162-5.6MW, Maximum Turbine Height Scenario

APPENDIX C: Visual Contrast Rating Worksheets

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 1: Tie Siding

PROJECT INFORMATION				
KOP 1: Tie Siding			Reviewers Name: Lori Davidson	
Distance to Project Area: Adjacent to boundary			Date: 1-9-2020	
Latitude: 41.080677° N			Longitude: -105.507013° W	
Angle of Observation: Level <input type="checkbox"/> Inferior <input type="checkbox"/> Superior <input checked="" type="checkbox"/>			Visibility: Screened <input type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input type="checkbox"/> (Partially/Completely)	
Type of User: Travelers Residential		Visual Sensitivity:		
		<i>User Expectation:</i> Moderate (travelers) High (residents)	<i>Duration of View:</i> Low (travelers) High (residents)	<i>Use Volume:</i> High (travelers) Low (residents)
				<i>Overall Sensitivity:</i> Moderate (travelers) High (residents)
Has a Photo Simulation Been Created for KOP? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			If yes, Figure Number: KOP 1, Appendix B	

CHARACTERISTIC LANDSCAPE DESCRIPTION			
	Land/Water	Vegetation	Structures
Form	Foreground (FG): flat, level Middleground (MG): flat, level to gently undulating Background (BG): low, blocky, undulating	FG: rounded, irregular MG: pyramidal (trees), large contiguous BG: irregular patches	FG: wide, flat, horizontal; geometric; tall vertical, thin; blocky MG: short, thin, complex BG: short, transparent
Line	FG: straight, horizontal MG: horizontal, gently undulating, thin curbing strip BG: horizontal, gently to moderately undulating, short diagonal lines	FG: straight, horizontal (butt-edge with road), horizontal and irregular MG: thin, irregular, horizontal BG: weak, horizontal (butt-edge between valley and mountain vegetation)	FG: short, thin, square/rectangular; tall, thin simple; angular MG: thin, parallel BG: short, thin
Color	FG/MG: reddish-brown, tan BG: not discernible	FG: pale-yellow, sage green, light and dark green MG: pale-yellow, sage green BG: pale-yellow, dark green	FG: gray, white, red, lack, yellow, green, brown MG: Brown, white BG: dark gray
Texture	FG: fine, granulated MG: fine BG: medium, striated	FG: fine, clumped, course MG: fine BG: fine	FG: fine, medium MG: even, ordered, fine to medium BG: even, ordered, fine

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 1: Tie Siding

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	N/A	N/A	MG: removal of grasses for roads and wind turbine pads	MG: removal of grasses for roads and wind turbine pads	FG/MG: tall, thin, vertical, uniform	FG/MG: tall, thin, vertical, uniform
Line	N/A	N/A	MG: long, curving, parallel (butt-edge with roads)	MG: long, curving, parallel (butt-edge with roads)	FG/MG: strong, straight, angular	FG/MG: strong, straight, angular
Color	N/A	N/A	MG: removal of pale-yellow and sage green grasses	MG: removal of pale-yellow and sage green grasses	FG/MG: white, light gray	FG/MG: white, light gray
Texture	N/A	N/A	MG: fine	MG: fine	FG/MG: fine, scattered	FG/MG: fine, scattered

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2										
Features				Features										
Elements	Degree of Contrast	LAND/WATER				VEGETATION				STRUCTURES				
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	
	FORM			X			X			X				
	LINE		X			X			X					
	COLOR			X			X			X				
TEXTURE			X			X			X					
Overall Level of Contrast: Strong				Overall Level of Contrast: Strong										

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 2: The Buttes

PROJECT INFORMATION								
KOP 2: The Buttes			Reviewers Name: Lori Davidson					
Distance to Project Area: 5.4 miles			Date: 1-9-2020					
Latitude: 41.160938° N			Longitude: -105.577750° W					
Angle of Observation: Level <input checked="" type="checkbox"/> Inferior <input type="checkbox"/> Superior <input type="checkbox"/>			Visibility: Screened <input checked="" type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input type="checkbox"/> (Partially/Completely)					
Type of User: Travelers Residential		Visual Sensitivity: <table border="1"> <tr> <td>User Expectation: Moderate (travelers) High (residents)</td> <td>Duration of View: Low (travelers) High (residents)</td> <td>Use Volume: High (travelers) Low (residents)</td> <td>Overall Sensitivity: Moderate (travelers) High (residents)</td> </tr> </table>			User Expectation: Moderate (travelers) High (residents)	Duration of View: Low (travelers) High (residents)	Use Volume: High (travelers) Low (residents)	Overall Sensitivity: Moderate (travelers) High (residents)
User Expectation: Moderate (travelers) High (residents)	Duration of View: Low (travelers) High (residents)	Use Volume: High (travelers) Low (residents)	Overall Sensitivity: Moderate (travelers) High (residents)					
Has a Photo Simulation Been Created for KOP? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			If yes, Figure Number: KOP 2, Appendix B					

CHARACTERISTIC LANDSCAPE DESCRIPTION			
	Land/Water	Vegetation	Structures
Form	Foreground (FG): flat, level Middleground (MG): flat, level to gently undulating; blocky Background (BG): low, moderately rolling	FG: short, uniform, rounded MG: irregular patches BG: not discernible	FG/MG: narrow, flat, horizontal; tall, thin; long, narrow, transparent, complex BG: short, transparent
Line	FG: straight, horizontal MG: horizontal, gently undulating BG: horizontal, moderately undulating	FG/MG: straight, horizontal (butt-edge with road and mineral extraction area) BG: not discernible	FG/MG: short, thin, simple; long, linear BG: short, weak
Color	FG/MG: reddish-brown, tan BG: not discernible	FG: pale-yellow, sage green, light and dark green MG: pale-yellow, sage green BG: not discernible	FG/MG: gray, white, yellow, black, brown BG: light gray
Texture	FG: fine, granulated MG: fine; medium, scattered BG: fine	FG: fine, clumped, coarse MG: fine BG: not discernible	FG/MG: fine, medium; even, ordered, simple; medium BG: fine



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 2: The Buttes

PROPOSED ACTIVITY DESCRIPTION							
	Land/Water		Vegetation		Structures		
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	
Form	N/A	N/A	N/A	N/A	BG: tall, thin, vertical, uniform	BG: tall, thin, vertical, uniform	
Line	N/A	N/A	N/A	N/A	BG: strong, straight, angular	BG: strong, straight, angular	
Color	N/A	N/A	N/A	N/A	BG: white, light gray	BG: white, light gray	
Texture	N/A	N/A	N/A	N/A	BG: fine, uniform	BG: fine, uniform	

CONTRAST RATING										
Minimum Impact Scenario 1				Maximum Impact Scenario 2						
Elements	Features									
	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES				
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE		WEAK	NONE
FORM			X			X		X		
LINE			X			X		X		
COLOR			X			X		X		
TEXTURE			X			X		X		
Overall Level of Contrast: Moderate				Overall Level of Contrast: Moderate						

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 3: Ames Monument

PROJECT INFORMATION

KOP 3: Ames Monument		Reviewers Name: Lori Davidson		
Distance to Project Area: 0.4 miles		Date: 1-9-2020		
Latitude: 41.130987° N		Longitude: -105.398258° W		
Angle of Observation: Level <input type="checkbox"/> Inferior <input type="checkbox"/> Superior <input checked="" type="checkbox"/>		Visibility: Screened <input type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input checked="" type="checkbox"/> (Partially/Completely)		
Type of User: Visitors Nearby residents	Visual Sensitivity:			
	<i>User Expectation:</i> High (visitor/resident)	<i>Duration of View:</i> Moderate to Low (visitors); High (residents)	<i>Use Volume:</i> Low (visitors and residents)	<i>Overall Sensitivity:</i> High (visitors and residents)
Has a Photo Simulation Been Created for KOP? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, Figure Number: KOP 3, Appendix B		

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground (FG): flat, level to gently undulation; blocky Middleground (MG): flat, level Background (BG): low, blocky, undulating	FG: rounded, pyramidal MG/BG: not discernible	FG: geometric; short, thin; angular and transparent MG/BG: not discernible
Line	FG: straight, horizontal MG: short, thin band BG: horizontal, linear, gently to moderately undulating,	FG: short, linear, irregular MG/BG: not discernible	FG: short, thin; square/rectangular and angular; tall, thin simple; MG/BG: not discernible
Color	FG: reddish-brown, tan MG/BG: not discernible	FG: pale-yellow, sage green, light and dark green MG: tan BG: dark green	FG: white, brown, gray MG/BG: not discernible
Texture	FG: fine, granulated MG/BG: fine	FG: fine, clumped, medium MG/BG: fine	FG: fine, medium; even, ordered MG/BG: not discernible

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 3: Ames Monument

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	N/A	N/A	N/A	N/A	FG/MG: tall, thin, vertical, uniform	FG/MG: tall, thin, vertical, uniform
Line	N/A	N/A	N/A	N/A	FG/MG: strong, straight, angular	FG/MG: strong, straight, angular
Color	N/A	N/A	N/A	N/A	FG/MG: white, light gray	FG/MG: white, light gray
Texture	N/A	N/A	N/A	N/A	FG: fine, scattered	FG: fine, scattered

CONTRAST RATING									
Minimum Impact Scenario 1				Maximum Impact Scenario 2					
Elements	Features			Features					
	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
FORM			X		X		X		
LINE		X		X		X			
COLOR			X		X		X		
TEXTURE			X		X		X		
Overall Level of Contrast: Strong				Overall Level of Contrast: Strong					

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 4: Cherokee Park Road and Fish Creek Road

PROJECT INFORMATION

KOP 4: Cherokee Park Road and Fish Creek Road		Reviewers Name: Lori Davidson		
Distance to Project Area: 0.8 miles		Date: 1-9-2020		
Latitude: 41.021381° N		Longitude: -105.553658° W		
Angle of Observation: Level <input checked="" type="checkbox"/> Inferior <input type="checkbox"/> Superior <input type="checkbox"/>		Visibility: Screened <input type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input checked="" type="checkbox"/> (Partially/Completely)		
Type of User: Travelers Residents	Visual Sensitivity:			
	<i>User Expectation:</i> Moderate (travelers) High (residents)	<i>Duration of View:</i> Low (travelers) High (residents)	<i>Use Volume:</i> Low (travelers/residents)	<i>Overall Sensitivity:</i> Moderate (travelers) High (residents)
Has a Photo Simulation Been Created for KOP? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, Figure Number: KOP 4, Appendix B		

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground (FG): flat, level Middleground (MG): flat, level to gently rolling Background (BG): low, undulating	FG/MG: not discernible BG: linear, irregular patch	FG: short, thin MG/BG: short, transparent
Line	FG/MG: not discernible BG: horizontal, linear, gently to moderately undulating,	FG/MG: not discernible MG/BG: not discernible	FG: short, regular, straight; horizontal, thin, parallel MG/BG: geometric, weak
Color	FG: reddish-brown, tan MG/BG: not discernible	FG/MG: pale-yellow, sage green BG: dark green	FG: light and dark brown MG/BG: light gray
Texture	FG: fine, granulated MG/BG: fine	FG/MG: fine, clumped BG: fine	FG: fine, simple; even, ordered MG/BG: even ordered, uniform

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 4: Cherokee Park Road and Fish Creek Road

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	N/A	N/A	MG: removal of grasses for roads and wind turbine pads	MG: removal of grasses for roads and wind turbine pads	FG/MG: tall, thin, vertical, uniform	FG/MG: tall, thin, vertical, uniform
Line	N/A	N/A	MG: long, curving, parallel (butt-edge with roads)	MG: long, curving, parallel (butt-edge with roads)	FG/MG: strong, straight, angular	FG/MG: strong, straight, angular
Color	N/A	N/A	MG: removal of pale-yellow and sage green grasses	MG: removal of pale-yellow and sage green grasses	FG/MG: white, light gray	FG/MG: white, light gray
Texture	N/A	N/A	MG: fine	MG: fine	FG: fine, scattered	FG: fine, scattered

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2								
Elements	Features				Elements	Features						
	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES						
		STRONG	MODERATE	WEAK		NONE	STRONG	MODERATE	WEAK	NONE		
FORM			X			X			X			
LINE			X			X			X			
COLOR			X			X			X			
TEXTURE			X			X			X			
Overall Level of Contrast: Strong				Overall Level of Contrast: Strong								

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 5: Virginia Dale Monument

PROJECT INFORMATION								
KOP 5: Virginia Dale Monument			Reviewers Name: Lori Davidson					
Distance to Project Area: 6.3 miles			Date: 1-9-2020					
Latitude: 40.957236 ° N			Longitude: -105.354692° W					
Angle of Observation: Level <input type="checkbox"/> Inferior <input checked="" type="checkbox"/> Superior <input type="checkbox"/>			Visibility: Screened <input checked="" type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input type="checkbox"/> <small>(Partially/Completely)</small>					
Type of User: Travelers		Visual Sensitivity: <table border="1"> <tr> <td><i>User Expectation:</i> Moderate</td> <td><i>Duration of View:</i> Low</td> <td><i>Use Volume:</i> High</td> <td><i>Overall Sensitivity:</i> Moderate</td> </tr> </table>			<i>User Expectation:</i> Moderate	<i>Duration of View:</i> Low	<i>Use Volume:</i> High	<i>Overall Sensitivity:</i> Moderate
<i>User Expectation:</i> Moderate	<i>Duration of View:</i> Low	<i>Use Volume:</i> High	<i>Overall Sensitivity:</i> Moderate					
Has a Photo Simulation Been Created for KOP? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			If yes, Figure Number: Not applicable					

CHARACTERISTIC LANDSCAPE DESCRIPTION			
	Land/Water	Vegetation	Structures
Form	Foreground (FG)/Middleground (MG): gently to moderately rolling, blocky Background (BG): steep, rugged	FG/MG: rounded, pyramidal BG: not discernible	FG: tall, thin; short, geometric; wide, flat MG/BG: flat, narrow
Line	FG/MG: short, irregular, complex; horizontal undulating BG: rounded, angular	FG/MG/BG: straight to curving (butt-edge with road)	FG: square, rectangular; short, simple; tall, narrow MG/BG: narrow band, straight to curving
Color	FG/MG/BG: reddish-brown, tan, gray	FG/MG: pale-yellow, sage green BG: dark green	FG: light and dark brown, gray, yellow, white, green MG/BG: gray, white, yellow
Texture	FG: fine, granulated; course MG/BG: rough, course	FG/MG: fine, clumped; scattered, dotted BG: fine to medium; irregular patches	FG: fine to medium, random MG/BG: fine

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 5: Virginia Dale Monument

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	N/A	N/A	N/A	N/A	not visible	not visible
Line	N/A	N/A	N/A	N/A	not visible	not visible
Color	N/A	N/A	N/A	N/A	not visible	not visible
Texture	N/A	N/A	N/A	N/A	not visible	not visible

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2						
Elements	Features				Features					
	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES				
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	
FORM			X				X			X
LINE			X				X			X
COLOR			X				X			X
TEXTURE			X				X			X
Overall Level of Contrast: None				Overall Level of Contrast: None						

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 6: Laramie/City Ranch Road

PROJECT INFORMATION

KOP 6: Laramie/City Ranch Road		Reviewers Name: Lori Davidson		
Distance to Project Area: 11 miles		Date: 1-9-2020		
Latitude: 41.248682 ° N		Longitude: -105.600277° W		
Angle of Observation: Level <input checked="" type="checkbox"/> Inferior <input type="checkbox"/> Superior <input type="checkbox"/>		Visibility: Screened <input checked="" type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input type="checkbox"/> (Partially/Completely)		
Type of User: Residents	Visual Sensitivity:			
	<i>User Expectation:</i> High	<i>Duration of View:</i> High	<i>Use Volume:</i> Low	<i>Overall Sensitivity:</i> High
Has a Photo Simulation Been Created for KOP? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			If yes, Figure Number: Not applicable	

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground (FG)/Middleground (MG): flat, level MG/Background (BG): low, linear band	FG/MG: large contiguous patch; rounded, pyramidal BG: not discernible	FG: tall, thin; short, geometric; wide, flat BG: not discernible
Line	FG/MG: straight, horizontal BG: horizontal, gently undulating	FG/MG: irregular, horizontal strip; straight and parallel (butt-edge with roads); BG: not discernible	FG: square, rectangular; short, simple; tall, narrow; linear, thin strip BG: not discernible
Color	FG: gray MG: reddish-brown BG: not discernible	FG/MG: pale-yellow, sage green, green, dark green BG: not discernible	FG: light and dark brown, light and dark gray, white, red BG: not discernible
Texture	FG: fine, granulated MG: medium BG: fine	FG/MG: fine, uniform; medium, dense BG: not discernible	FG: simple, uniform, even, ordered; medium to fine, scattered BG: not discernible

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 6: Laramie/City Ranch Road

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	N/A	N/A	N/A	N/A	BG: short, thin	BG: tall, thin, numerous
Line	N/A	N/A	N/A	N/A	BG: straight, vertical, angular	BG: straight, vertical, angular
Color	N/A	N/A	N/A	N/A	BG: white, light gray	BG: white, light gray
Texture	N/A	N/A	N/A	N/A	BG: fine	BG: fine

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2					
Features				Features					
Elements	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
	FORM			X		X		X	
	LINE			X		X		X	
	COLOR			X		X		X	
TEXTURE			X		X		X		
Overall Level of Contrast: Weak				Overall Level of Contrast: Moderate					

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

The maximum impact scenario would introduce almost half of the wind turbines as the minimum impact scenario, however, due to the taller structures, more of the wind turbines located east of U.S. Highway 287 would be visible extending above intervening terrain. This would result in a more spatially dominant appearance of the wind turbines in the background because they extend across the horizon between the rolling hills and Laramie Mountains.

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 7: Mortenson Lake NWR/Wy. Highway 230

PROJECT INFORMATION

KOP 7: Mortenson Lake NWR/Wyoming Highway 230		Reviewers Name: Lori Davidson		
Distance to Project Area: 14 miles		Date: 1-9-2020		
Latitude: 41.207985 ° N		Longitude: -105.785758° W		
Angle of Observation: Level <input checked="" type="checkbox"/> Inferior <input type="checkbox"/> Superior <input type="checkbox"/>		Visibility: Screened <input type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input checked="" type="checkbox"/> (Partially/Completely)		
Type of User: Travelers	Visual Sensitivity:			
	<i>User Expectation:</i> Moderate	<i>Duration of View:</i> Low	<i>Use Volume:</i> Moderate	<i>Overall Sensitivity:</i> Moderate
Has a Photo Simulation Been Created for KOP? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			If yes, Figure Number: KOP 7, Appendix B	

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground (FG)/Middleground (MG): flat, level MG/Background (BG): low, linear band	FG/MG: large contiguous patch; thin, horizontal BG: not discernible	FG: short, thin, numerous; tall, thin MG/BG: not discernible
Line	FG/MG: straight, horizontal BG: horizontal, gently undulating	FG/MG: straight, horizontal; thin, short, horizontal and parallel (butt-edge with roads); BG: not discernible	FG: short, simple; strong, vertical, thin MG/BG: not discernible
Color	FG/MG/BG: not discernible	FG/MG: pale-yellow, sage green, dark green BG: not discernible	FG: light and dark brown, gray MG/BG: not discernible
Texture	FG: fine MG/BG: fine, medium	FG/MG: fine, uniform; clumped, scattered BG: not discernible	FG: simple, uniform, even, ordered; MG/BG: not discernible

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 7: Mortenson Lake NWR/Wy. Highway 230

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	not discernible	not discernible	not discernible	not discernible	BG: short, thin, numerous	BG: short, thin, numerous
Line	not discernible	not discernible	not discernible	not discernible	BG: straight, vertical, angular	BG: straight, vertical, angular
Color	not discernible	not discernible	not discernible	not discernible	BG: white, light gray	BG: white, light gray
Texture	not discernible	not discernible	not discernible	not discernible	BG: fine	BG: fine

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2										
Elements	Features				Features									
	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES		Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES	
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE		WEAK	NONE	STRONG	MODERATE	WEAK	NONE
FORM			X				X	X				X		
LINE			X				X				X			
COLOR			X				X				X			X
TEXTURE			X				X				X			X
Overall Level of Contrast: Weak				Overall Level of Contrast: Moderate										

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

The maximum impact scenario would introduce almost half of the wind turbines as the minimum impact scenario, however, more of the wind turbines would be visible extending above intervening terrain. This would result in a more spatially dominant appearance of the wind turbines in the background because they extend across the horizon between the rolling hills and Laramie Mountains.

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 8: Medicine Bow-Routt National Forest

PROJECT INFORMATION

KOP 8: Medicine Bow-Routt National Forest		Reviewers Name: Lori Davidson		
Distance to Project Area: 2.5 miles		Date: 1-9-2020		
Latitude: 41.156264 ° N		Longitude: -105.377909° W		
Angle of Observation: Level <input checked="" type="checkbox"/> Inferior <input type="checkbox"/> Superior <input type="checkbox"/>		Visibility: Screened <input type="checkbox"/> Backdropped <input checked="" type="checkbox"/> Skylined <input type="checkbox"/> (Partially/Completely)		
Type of User: Recreationists	Visual Sensitivity:			
	<i>User Expectation:</i> High	<i>Duration of View:</i> High	<i>Use Volume:</i> Moderate	<i>Overall Sensitivity:</i> High
Has a Photo Simulation Been Created for KOP? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			If yes, Figure Number: Not applicable	

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground (FG)/Middleground (MG): flat, level to gently rolling Background (BG): short, linear band	FG: large contiguous patch; pyramidal, rounded MG: irregular patches BG: not discernible	FG: short, thin, numerous MG: tall, thin BG: not discernible
Line	FG/MG/BG: gently undulating, horizontal	FG: weak, broken, irregular MG: straight, horizontal; weak, broken, irregular BG: not discernible	FG: short, simple; strong, vertical and horizontal, parallel MG: thin, weak BG: not discernible
Color	FG: reddish-brown MG/BG: not discernible	FG: pale-yellow, sage green, dark green, yellow MG: pale-yellow BG: not discernible	FG: dark brown MG: light gray BG: not discernible
Texture	FG/MG/BG: fine	FG/MG: fine, uniform; clumped, scattered BG: not discernible	FG: simple, uniform, even, ordered MG: fine BG: not discernible

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 8: Medicine Bow-Routt National Forest

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	NA	NA	NA	NA	BG: short, thin	BG: short, thin, numerous
Line	NA	NA	NA	NA	BG: straight, vertical, angular	BG: straight, vertical, angular
Color	NA	NA	NA	NA	BG: white, light gray	BG: white, light gray
Texture	NA	NA	NA	NA	BG: fine	BG: fine

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2					
Elements	Features								
	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
FORM			X			X		X	
LINE			X			X		X	
COLOR			X			X		X	
TEXTURE			X			X		X	
Overall Level of Contrast: Weak				Overall Level of Contrast: Moderate					

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

The maximum impact scenario would introduce almost half of the wind turbines as the minimum impact scenario, however, more of the wind turbines would be visible extending above intervening terrain. Furthermore, more of the individual wind turbine structures would also be visible including the nacelle and upper portion of the blade.

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 9: Interstate 80

PROJECT INFORMATION				
KOP 9: Interstate 80			Reviewers Name: Lori Davidson	
Distance to Project Area: 4.5 miles			Date: 1-9-2020	
Latitude: 41.123837 ° N			Longitude: -105.300574° W	
Angle of Observation: Level <input checked="" type="checkbox"/> Inferior <input type="checkbox"/> Superior <input type="checkbox"/>			Visibility: Screened <input checked="" type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input checked="" type="checkbox"/> (Partially/Completely)	
Type of User:		Visual Sensitivity:		
Travelers		User Expectation: Low	Duration of View: Low	Use Volume: High
		Overall Sensitivity: Low		
Has a Photo Simulation Been Created for KOP? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			If yes, Figure Number: KOP 9, Appendix B	

CHARACTERISTIC LANDSCAPE DESCRIPTION			
	Land/Water	Vegetation	Structures
Form	Foreground (FG)/Middleground (MG): flat, level to gently rolling Background (BG): short, linear band	FG/MG: irregular and patchy; pyramidal, rounded BG: not discernible	FG/MG: short, thin, numerous; tall, simple/geometric, transparent; blocky, rectangular; long, linear, horizontal BG: not discernible
Line	FG/MG: gently undulating, horizontal BG: irregular, horizontal	FG: straight, long (butt-edge of parking lot) MG: short, irregular, horizontal BG: not discernible	FG/MG: strong vertical, straight and geometric; angular and rectangular BG: not discernible
Color	FG/MG: reddish-brown BG: not discernible	FG/MG: pale-yellow, sage green, green, dark green BG: not discernible	FG/MG: light and dark brown, reddish-brown, green, light and dark gray, white, red BG: not discernible
Texture	FG: fine, granulated MG/BG: fine to medium	FG/MG: fine, uniform; clumped, scattered BG: not discernible	FG/MG: simple, uniform, even, ordered; medium; complex BG: not discernible

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 9: Interstate 80

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	NA	NA	NA	NA	BG: short, thin, angular	BG: short, thin, angular
Line	NA	NA	NA	NA	BG: straight, vertical, angular	BG: straight, vertical, angular
Color	NA	NA	NA	NA	BG: white, light gray	BG: white, light gray
Texture	NA	NA	NA	NA	BG: fine	BG: fine

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2												
Elements	Features				Features											
	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES		Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE		WEAK	NONE	STRONG	MODERATE	WEAK	NONE		
FORM			X				X				X					X
LINE			X				X				X					X
COLOR			X				X				X					X
TEXTURE			X				X				X					X
Overall Level of Contrast: Weak				Overall Level of Contrast: Weak												

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

Given the limited number of wind turbines visible, the existing human-made features which will continued to be dominant features on the landscape and the short duration that the viewer would have as they travel along the highway, the Project would attract attentions but appear as a subordinate feature in the landscape.

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 10: Arapaho & Roosevelt National Forest

PROJECT INFORMATION

KOP 10: Arapaho & Roosevelt National Forest		Reviewers Name: Lori Davidson		
Distance to Project Area: 9.1 miles		Date: 1-9-2020		
Latitude: 40.863245 ° N		Longitude: -105.493341° W		
Angle of Observation: Level <input type="checkbox"/> Inferior <input type="checkbox"/> Superior <input checked="" type="checkbox"/>		Visibility: Screened <input checked="" type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input type="checkbox"/> (Partially/Completely)		
Type of User: Travelers Residents	Visual Sensitivity:			
	<i>User Expectation:</i> Moderate (travelers) High (residents)	<i>Duration of View:</i> Low (travelers) High (residents)	<i>Use Volume:</i> Low (travelers/residents)	<i>Overall Sensitivity:</i> High
Has a Photo Simulation Been Created for KOP? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes, Figure Number: Not applicable		

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground (FG)/Middleground (MG): gently sloping to moderately rolling; blocky Background (BG): moderate to steep hills	FG/MG: irregular and patchy; pyramidal, rounded BG: not discernible	FG: small, geometric; short, thin MG/FG: n/a
Line	FG/MG/BG: undulating horizontal	FG: strong, straight line between field and trees MG: irregular, broken; thin, horizontal, weak BG: irregular, patchy; undulating, irregular along horizon	FG: short, angular and horizontal; short narrow band MG/FG: n/a
Color	FG/MG: gray BG: not discernible	FG/MG: pale-yellow, sage green, dark green BG: dark green	FG: light gray, green, white, brown MG/FG: n/a
Texture	FG/MG: fine, medium to coarse BG: medium	FG/MG: fine to coarse BG: fine; stippled	FG: simple, fine MG/FG: n/a

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 10: Arapaho & Roosevelt National Forest

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	NA	NA	NA	NA	NA	NA
Line	NA	NA	NA	NA	NA	NA
Color	NA	NA	NA	NA	NA	NA
Texture	NA	NA	NA	NA	NA	NA

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2					
Elements	Features								
	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
FORM			X			X			X
LINE			X			X			X
COLOR			X			X			X
TEXTURE			X			X			X
Overall Level of Contrast: None									

Elements	Features								
	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
FORM			X			X			X
LINE			X			X			X
COLOR			X			X			X
TEXTURE			X			X			X
Overall Level of Contrast: None									

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

Due to the distance of the viewpoint to the Project and the intervening terrain associated with the Laramie Mountain Range, views toward the Project would be completely screened. As such the Project will introduce no visual change.

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 11: Snowy Range Road/Big Hollow Road

PROJECT INFORMATION

KOP 11: Snowy Range Road/Big Hollow Road		Reviewers Name: Lori Davidson		
Distance to Project Area: 22 miles		Date: 1-9-2020		
Latitude: 41.306357 ° N		Longitude: -105.869069° W		
Angle of Observation: Level <input type="checkbox"/> Inferior <input type="checkbox"/> Superior <input checked="" type="checkbox"/>		Visibility: Screened <input type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input checked="" type="checkbox"/> (Partially/Completely)		
Type of User: Travelers	Visual Sensitivity:			
	<i>User Expectation:</i> High	<i>Duration of View:</i> Low	<i>Use Volume:</i> Moderate	<i>Overall Sensitivity:</i> High
Has a Photo Simulation Been Created for KOP? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			If yes, Figure Number: KOP 11, Appendix B	

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground (FG): moderately sloping to flat, level Middleground (MG): flat, level Background (BG): low, linear band	FG/MG: large continuous; thin, horizontal BG: patchy	FG: thin, solid band; short, narrow bands; short and tall, thin, numerous: small, geometric MG/BG: not discernible
Line	FG: diagonal MG: weak, straight, horizontal BG: undulating horizontal	FG: long, curving (butt-edge with road) MG: long, thin, broken BG: not discernible	FG: curving; short, broken, geometric; square; thin, vertical, weak MG/BG not discernible
Color	FG/MG: not discernible BG: reddish-brown	FG/MG: pale-yellow, sage green, dark green BG: dark green	FG: gray, brown, yellow, white MG/BG not discernible
Texture	FG/MG: fine, striated BG: medium	FG/MG: fine, uniform BG: fine	FG: simple, fine; uniform, even, ordered; medium MG/BG not discernible

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 11: Snowy Range Road/Big Hollow Road

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	NA	NA	NA	NA	BG: short, vertical, numerous	BG: short, vertical, numerous
Line	NA	NA	NA	NA	BG: short, thin	BG: short, thin
Color	NA	NA	NA	NA	BG: white, subtle	BG: white, subtle
Texture	NA	NA	NA	NA	BG: stippled	BG: stippled

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2									
Elements	Features												
	Degree of Contrast	LAND/WATER				VEGETATION				STRUCTURES			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
FORM			X				X			X			
LINE			X				X			X			
COLOR			X				X			X			
TEXTURE			X				X			X			
Overall Level of Contrast: Weak													

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 12: U.S. Highway 30 – Willow Trail

PROJECT INFORMATION

KOP 12: U.S. Highway 30 – Willow Trail		Reviewers Name: Lori Davidson	
Distance to Project Area: 20 miles		Date: 1-9-2020	
Latitude: 41.401683 ° N		Longitude: -105.5966° W	
Angle of Observation: Level <input type="checkbox"/> Inferior <input type="checkbox"/> Superior <input checked="" type="checkbox"/>		Visibility: Screened <input checked="" type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input type="checkbox"/> (Partially/Completely)	
Type of User: Travelers	Visual Sensitivity:		
	<i>User Expectation:</i> Low	<i>Duration of View:</i> Low	<i>Use Volume:</i> Moderate
Has a Photo Simulation Been Created for KOP? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			If yes, Figure Number: Not applicable

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground (FG): flat, level Middleground (MG): flat, level to moderately rolling Background (BG): low, linear band	FG/MG: mostly snow-covered – appears patchy BG: not discernible	FG: thin, solid band; short and tall, thin, numerous: small, geometric MG/BG: not discernible
Line	FG/MG: weak, straight, horizontal BG: undulating horizontal	FG/MG: long, straight, parallel (butt-edge with road) MG: irregular, broken BG: not discernible	FG: straight, narrow; short, even; geometric; square; thin, vertical; thin broken MG/BG not discernible
Color	FG/MG/BG: not discernible	FG/MG: mostly snow-covered; portions visible are pale-yellow, dark green BG: not discernible	FG: gray, brown, yellow, white MG/BG not discernible
Texture	FG/MG/BG: fine	FG/MG: fine, scattered clumps BG: not discernible	FG: simple, fine; uniform, even, ordered; medium MG/BG not discernible

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 12: U.S. Highway 30 – Willow Trail

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	NA	NA	NA	NA	NA	NA
Line	NA	NA	NA	NA	NA	NA
Color	NA	NA	NA	NA	NA	NA
Texture	NA	NA	NA	NA	NA	NA

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2						
Features										
Elements	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES				
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	
	FORM			X			X			X
	LINE			X			X			X
	COLOR			X			X			X
TEXTURE			X			X			X	
Overall Level of Contrast: None										

Features										
Elements	Degree of Contrast	LAND/WATER		VEGETATION		STRUCTURES				
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	
	FORM			X			X			X
	LINE			X			X			X
	COLOR			X			X			X
TEXTURE			X			X			X	
Overall Level of Contrast: None										

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

From this viewpoint, the majority of the Project would be screened by intervening terrain. Portions of wind turbines that extend above terrain would be primarily limited to the upper portion of the turbine blades and tips of the turbines. It is anticipated that the thin lines created by the blades will not be noticeable or perceived by viewers along the highway at this distance. As such, the Project will create no visual contrast.

VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 13: Bath Brothers Ranch – Herrick Road

PROJECT INFORMATION

KOP 13: Bath Brothers Ranch – Herrick Road		Reviewers Name: Lori Davidson		
Distance to Project Area: 25 miles		Date: 1-9-2020		
Latitude: 44.395406 ° N		Longitude: -105.843693 ° W		
Angle of Observation: Level <input type="checkbox"/> Inferior <input type="checkbox"/> Superior <input checked="" type="checkbox"/>		Visibility: Screened <input checked="" type="checkbox"/> Backdropped <input type="checkbox"/> Skylined <input type="checkbox"/> (Partially/Completely)		
Type of User: Travelers Residents	Visual Sensitivity:			
	<i>User Expectation:</i> High	<i>Duration of View:</i> High	<i>Use Volume:</i> Low	<i>Overall Sensitivity:</i> High
Has a Photo Simulation Been Created for KOP? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			If yes, Figure Number: Not applicable	

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground (FG): flat, level Middleground (MG): low, horizontal ridge Background (BG): low, linear band	FG/MG: mostly snow-covered – appears patchy BG: not discernible	FG: short and tall, thin, numerous; geometric MG/BG: n/a
Line	FG: not discernible MG: straight, horizontal BG: short, undulating horizontal, weak	FG/MG: long, linear and loose along fence line and at base of ridge BG: not discernible	FG: short, thin, even; geometric; thin, vertical MG/BG: n/a
Color	FG/MG/BG: not discernible	FG/MG: mostly snow-covered; portions visible are pale-yellow, tan, reddish BG: not discernible	FG: brown, white, reddish-brown, MG/BG: n/a
Texture	FG/MG/BG: fine	FG/MG: fine, scattered clumps BG: not discernible	FG: simple, fine; uniform, even, ordered MG/BG: n/a

REPRESENTATIVE PHOTOGRAPH



VISUAL CONTRAST RATING WORKSHEET

Rail Tie Wind Project

KOP 13: Bath Brothers Ranch – Herrick Road

PROPOSED ACTIVITY DESCRIPTION						
	Land/Water		Vegetation		Structures	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Form	NA	NA	NA	NA	NA	NA
Line	NA	NA	NA	NA	NA	NA
Color	NA	NA	NA	NA	NA	NA
Texture	NA	NA	NA	NA	NA	NA

CONTRAST RATING

Minimum Impact Scenario 1				Maximum Impact Scenario 2									
Elements	Features												
	Degree of Contrast	LAND/WATER				VEGETATION				STRUCTURES			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
FORM			X				X					X	
LINE			X				X					X	
COLOR			X				X					X	
TEXTURE			X				X					X	
Overall Level of Contrast: None				Overall Level of Contrast: None									

Contrast Rating Criteria:

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape
Moderate	The element contrast attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments:

Views toward the Project would be completely screened by a low ridge located approximately 5 mi southeast of the viewpoint. As such the Project will introduce no visual change.