REPORT

Visual Effects Assessment

Desert Claim Wind Power Project

Submitted to:

Washington State Energy Facility Site Evaluation Council

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Executive Summary

This report assesses the potential visual effects of the current Desert Claim Wind Power Project (the “Project”) design to assist the Washington Energy Facility Site Evaluation Council in making a determination of potential impacts of the Project under the State Environmental Policy Act. This report includes a description of technical methodology, summary of the key findings of previous visual impacts analysis (in the Final Environmental Impact Statement [FEIS] and Final Supplemental Environmental Impact Statement [FSEIS]), analysis of information provided in the 2018 Site Certification Agreement Amendment Request and related visual effects from the current Project design, and mitigation measure recommendations.

The results of the visual assessment indicate that the construction and decommission phases of the Project are predicted to result in visual effects related to the introduction of construction equipment and activities during these periods creating temporary changes in the existing visual quality of a portion of the Kittitas Valley that fall within the assessment study area. The temporary visual effects of construction and decommission phases will be fully mitigated after the conclusion of construction and decommission activity and with the removal of equipment and the re-establishment of the natural appearance of disturbed areas. During the operations and maintenance phase of the Project, the presence of turbines, Project related built structures (e.g., operation and maintenance facilities, Project substation, meteorological towers), and vegetation clearing has the potential to create long-term visual changes to the existing visual quality of the assessment study area.

Previous analysis of proposed Project configurations in the Final Environmental Impact Statement and Final Supplemental Environmental Impact Statement generally concluded that while long-term visual impacts would vary with viewer location and proximity, the Project would be most apparent to, and have the highest degree of visual impact on, observers closest to the turbines and particularly those within foreground viewing distances. While three viewing locations analyzed in this visual assessment retained the same level of visual effect as assessed in the Final Supplemental Environmental Impact Statement, there is a notable reduction in visual effects from the proposed Project configuration at four viewing locations compared to previous Project configurations despite an increase in the size of turbines. The assertion from the Certificate Holder that the proposed Project configuration would reduce visual impacts relative to the permitted project was confirmed for the seven key viewpoints identified in this assessment. The information available in the FEIS and FSEIS visual assessments were also evaluated.

ACRONYMS & ABBREVIATIONS

CESA	Clean Energy States Alliance
EFSEC	Washington Energy Facility Site Evaluation Council
FEIS	Final Environmental Impact Statement
FSEIS	Final Supplemental Environmental Impact Statement
FHWA	U.S. Department of Transportation Federal Highway Administration
RA	Request to Amend the Site Certificate Agreement
SCA	Site Certification Agreement
SEPA	State Environmental Policy Act
SLR	Single lens reflex
VP	viewpoint

UNITS OF MEASURE

ft	Feet
MW	Megawatts
m	Meters
°	Degrees

GLOSSARY OF TERMS

Disturbance	Change in a landscape visual conditions that is caused by development activities
Foreground	Visible area of a landscape that is less than ¼ mile from the observer
Key viewpoints	Selected representative viewing locations used to conduct the visual assessment
Sightline	A direction along which an observer has unobstructed vision
Middle-ground	Visible area of a landscape that is between ¼ mile to 5 miles from the observer
Project (the)	The activities and components associated with the construction, operation and maintenance and decommissioning of the Desert Claim Wind Power Project as described in the project description
Dominance	The degree to which an object occupies the visual field of view and is the focus of visual attention
Viewer exposure	The viewer’s ability to observe landscape features related to viewing conditions (e.g., number of viewers, duration of view)
Viewer sensitivity	The degree to which viewers are receptive to visual change based on the activity and awareness of the surrounding visual landscape and character
Visibility	The ability to visually discern an object in the landscape
Visual character	An area's distinct combination of visual resources and patterns in the landscape that creates a unique sense of place
Visual effects	Changes in visual quality as a result of visual changes
Visual resources	Natural and built landscape features that compose the surrounding visual environment and contribute landscape character
Visual quality	The aesthetic value of the landscape considering the variety and integrity of landscape patterns and features
Visual contrast	The compatibility between the characteristics of the project features and the existing landscape character

Table of Contents

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

In 2010, the Desert Claim Wind Power Project (the Project) received a Site Certification Agreement (SCA) for installation and operation of up to 95 turbines and associated facilities, generating up to 190 megawatts (MW) on approximately 5,200 acres in Kittitas County, Washington. The current certificate holder, Desert Claim Wind Power LLC (Certificate Holder), submitted a Request to Amend the SCA (RA) in February 2018, describing a revised facility design with up to 31 turbines on approximately 4,393 acres to generate a total capacity of no more than 100 MW.

The Washington Energy Facility Site Evaluation Council (EFSEC) determined that there is the potential for visual effects from the revised facility design that have not been adequately assessed relative to the detailed analysis of visual impacts provided in the 2004 Final Environmental Impact Statement (FEIS) (Section 3.10), the 2009 Final Supplemental Environmental Impact Statement (FSEIS) (Section 3.4), and recent information provided in the 2018 RA. In addition, public comments submitted at an April 2018 hearing expressed concern over the visual impacts of the proposed Project. EFSEC requested Golder to provide an updated visual assessment to examine the potential for visual effects from Project related features and activities based on current Project information, and to more fully address the State Environmental Policy Act (SEPA) checklist requirement for aesthetics (Section B.10 of the SEPA checklist included in the RA).

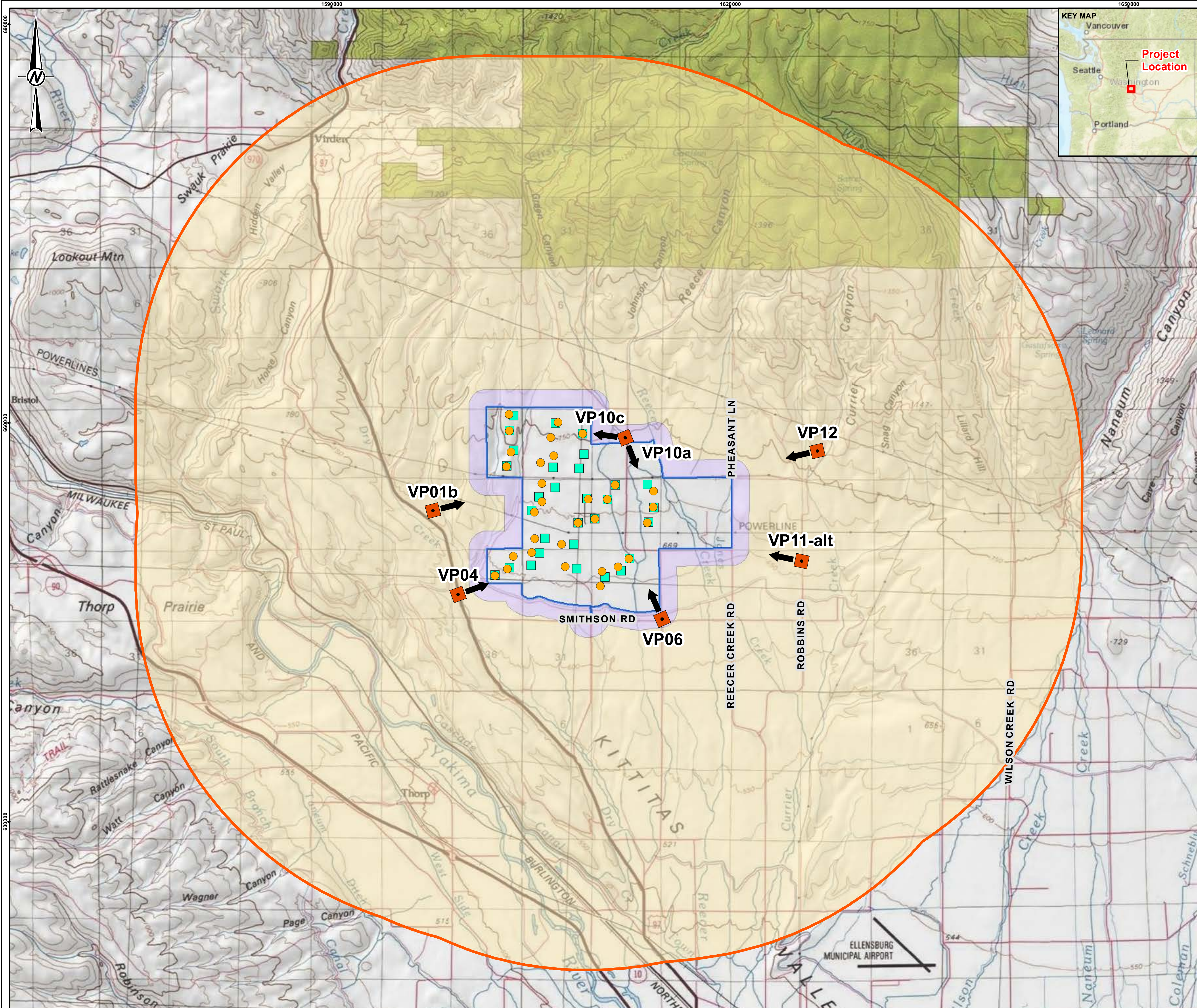
This visual effects assessment was undertaken by Golder to assist in EFSEC's determination of potential impacts of the Project under SEPA. The objective of this report is to provide supplemental information that references and validates existing visual quality and visual effects analysis, offering a concise assessment of potential visual effects of the current Project design with a focus on the evaluating proposed changes in the Project, and any different visual effects associated with those changes. This report includes technical methodology, summary of the key findings of the FEIS and FSEIS analysis of visual impacts of the Project, an analysis of information provided in the 2018 RA (e.g., project description, visual simulations) and related visual effects from the current Project design, and mitigation measure recommendations.

2.0 PROJECT DESCRIPTION

The Project is described in detail in the Revised Project Description (Desert Claim Wind Power LLC 2018). The following information on Project location, components and activities provides relevant details for the assessment of potential Project-related visual effects spatially and temporally.

2.1 Project Location

The Project is located approximately 8.0 miles north of the center of Ellensburg, Washington. The area of the Project extends approximately 4.0 miles from west to east and approximately 3.5 miles north to south. The southwestern corner of the Project area is ½ mile east of U.S. Route 97. The Project area covers approximately 4,393.0 acres of land, including 2,625.8 acres which will be leased from four private landowners, 636.7 acres which will be leased from Washington Department of Natural Resources, and 1,130.5 acres which will be owned by an affiliate of the Certificate Holder. The Project area will be accessed from Smithson Road. The location of the Project is illustrated in Figure 1.



LEGEND

- Truescape Viewpoint
- Viewing Direction
- Project Boundary
- Study Area

Viewing Distance Zone

- Foreground (.25 mi)
- Middle-ground (5 mi)
- US Forest Service Land

Turbine Layouts

- Layout 114 - Siemens 80 MW turbine
- Layout 110 - Vestas 100 MW turbine

0 2 4
MILES

NOTE(S)
1.

REFERENCE(S)
1. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
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CLIENT
WA EFSEC

PROJECT
DESERT CLAIM VISUAL ASSESSMENT

TITLE
VISUAL ASSESSMENT STUDY AREA AND VIEWPOINTS

CONSULTANT
GOLDER

YYYY-MM-DD	2018-09-06
DESIGNED	-
PREPARED	HJ
REVIEWED	DH
APPROVED	KW

PROJECT NO.	PHASE	REV.	FIGURE
1544295	005C	0	1

2.2 Project Components and Activities

The following descriptions of the proposed Project design and activities are summarized from information provided in the RA.

2.2.1 Wind Turbines

The proposed Project configuration includes a maximum of 31 wind turbines (also referred to as wind turbine generators) distributed across the Project area. Each turbine consists of three rotor blades connected to a rotor hub, a nacelle (a rectangular housing that covers the operating mechanism of the turbine connected to the rotor hub), and a tubular tower anchored to a tower foundation. The Certificate Holder proposes to use commercially available turbines for the Project, with capacity ranging from 2.0 to 4.2 MW. Depending upon the turbine model selected, each tower will be between 262 and 280 feet in hub height. Each tower will have a diameter of approximately 6 meters at the base, tapering at the top of the structure. The rolled steel forming the tower structure will have a smooth exterior surface. The turbine towers will be painted a neutral color as directed by the Federal Aviation Administration. Each nacelle will be approximately 71 feet long, 14 feet wide and 23 feet high. See Figure 5 of the 2018 SCA amendment for an example image of a typical wind turbine in operation (EDF Renewable Energy 2018a). Table 1 provides information on the dimensions of proposed turbine models.

Table 1: Turbine Model Information

Turbine	Hub Height	Tip Height	Rotor Diameter
Vestas V110	262 ft (80 m)	443 ft (135 m)	361 ft (110 m)
Vestas V136	269 ft (82 m)	492 ft (150 m)	446 ft (136 m)
Siemens SWT120	279 ft (85.1 m)	476 ft (145 m)	394 ft (120 m)
Siemens SWT108	262 ft (80 m)	440 ft (134 m)	354 ft (108 m)

The Certificate Holder is currently considering three possible turbine configurations, described as follows:

- 100 MW Vestas Layout - a maximum capacity of 100 MW, utilizing 30 Vestas turbines. It includes 25 Vestas V136 turbines, and 5 Vestas V110 turbines. See Figure 6 of the 2018 SCA amendment for the configuration of this layout (EDF Renewable Energy 2018a).
- 80 MW Vestas Layout - a maximum capacity of 80 MW, utilizing 25 Vestas turbines. It includes 20 Vestas V136, and 5 Vestas V110 turbines. See Figure 7 of the 2018 SCA amendment for the configuration of this layout (EDF Renewable Energy 2018a).
- 80 MW Siemens Layout - includes 31 turbines for a total capacity of 80 MW. It includes 27 Siemens SWT120 turbines and 4 Siemens SWT108 turbines. See Figure 8 of the 2018 SCA amendment for the configuration of this layout (EDF Renewable Energy 2018a).

The reduction in the number of turbines proposed in the RA allows for greater setbacks, and under the proposed configurations, all turbines will be located at least 2,500 feet from residences.

2.2.2 Other Project Facilities

2.2.2.1 Electrical Collection and Distribution System

The electrical system for the Project will consist primarily of a power collection system, a substation and an interconnection to the regional power transmission grid. Power collection cables will be placed underground or on road or water crossing structures where necessary. The network of power collection cables connecting the turbines to the Project substation is located near the southwestern corner of Section 16, Township 19N, Range 18E, approximately 1 mile north of Reecer Creek Road. An overhead transmission line will connect the Project substation with one of the high-voltage electrical transmission lines that cross the Project Area. The transmission interconnection is expected to be a 230-kV line that will be supported on wood-pole structures approximately 76 feet in height. See Figure 1 to 6 of the 2018 SCA amendment for the location of these features (EDF Renewable Energy 2018a).

2.2.2.2 Access Roadways

Road access to the Project area is currently provided by a number of existing public roads (e.g., Smithson Road, Reecer Creek Road, Pheasant Lane and Lower Green Canyon Road). The Project will be accessed during construction and operation from Smithson Road. New graveled roads will be constructed in areas where existing roads do not provide access to the turbines. The proposed access road system will be approximately 20 miles in length and will consist of single-lane roads with a width of 16 feet for straight sections and up to a 20-foot width for curved sections.

2.2.2.3 Operations and Maintenance Facilities

The proposed Project facilities include a permanent operations and maintenance (O&M) facility located one mile north of the intersection of Reecer Creek Road and Pheasant Lane. This facility will include an enclosed bay for storage of equipment and supplies, a workshop, an office for administration and monitoring of the facility, restroom and kitchen facilities, and parking for vehicles.

2.2.2.4 Meteorological Towers

The Project will include up to four free-standing permanent meteorological towers. The height of the meteorological towers shall not exceed the hub height of the turbines selected. See Figure 11 of the 2018 SCA amendment for an example image of a permanent meteorological tower. (EDF Renewable Energy 2018a).

2.2.3 Construction Activities

Construction of the Project will involve standard construction practices and procedures typically used for wind energy projects in the Northwest. In general, the first few months of construction activity will include construction of the Project access roads and tower foundations, the power collection system and communication lines, and the substation. Tower installation will be accomplished in phases as Project access roads and tower foundations are completed. Constructing the Project will require the use of various types of construction equipment such as bulldozers, graders, backhoes, cranes and flatbed trucks.

Construction activities will require temporary disturbance of a larger area than will be occupied by the permanent Project facilities. Project access roads and turbine pads will require clearing and grading. The temporary disturbance width along the access roads is assumed to be 60 feet. Temporary construction disturbance around the turbine pads is assumed to occupy an area of about 13 acres per turbine. Topsoil removed during grading will be stockpiled onsite adjacent to the disturbed areas. The removed topsoil will be re-spread, re-contoured, and re-vegetated as soon as possible after road construction is completed.

Temporary laydown or staging areas will be established in the Project area to support various construction functions including temporary storage of tower sections, turbine components, equipment and supplies, parking of construction vehicles and equipment, and possible installation of portable fuel tanks surrounded by earthen berms. One or more staging areas approximately 10 acres in size will be needed and these temporary facilities will be placed near existing roads and on previously disturbed land (e.g., heavily grazed and/or crop or pasture lands). All areas temporarily disturbed by Project construction will be restored to their original condition and reseeded with native vegetation. A final site cleanup will be made prior to Project operations and will include the collection and disposal of all construction debris and other waste materials.

2.2.4 Operation Activities

Long-term operation and maintenance activities for the Project will include turbine operations, periodic routine maintenance and on-site repairs of Project equipment and access roads, as necessary. Scheduled maintenance will be conducted approximately every six months on each wind turbine. Most servicing of the turbines will be performed within the nacelle, rather than using a crane to remove the turbine from the tower. The use of a crane and equipment transport vehicles for turbine adjustments, larger repairs or replacement of rotors or nacelle equipment will be needed on an occasional basis.

The Project's wind turbines will not operate during all hours of the year because the wind does not blow at sufficient speeds to operate the turbines all the time. It is anticipated that the Project will operate approximately 60 percent of the time (approximately 5,300 hours annually) with most the annual production occurring from March through October. Annual and seasonal variations are expected.

2.2.5 Decommission Activities

Decommissioning the Project will involve removal of the wind turbines, foundations, cables, and other facilities to a depth of 4 feet below grade, re-grading of the areas around the Project facilities, removal of Project access roads (except for any roads that landowners want to remain), and the final restoration of disturbed lands. If any individual turbine generates electricity for fewer than 250 hours during a continuous period of twelve months during operations, it will be decommissioned.

3.0 ASSESSMENT APPROACH

3.1 Study Boundaries

Study boundaries were defined for the purposes of assessing the potential Project-related visual effects in this assessment. The study boundaries are spatial and temporal limits which are delineated based on the extent of potential visual disturbance from the Project.

3.1.1 Project Boundary

The Project Boundary is defined as the physical extent of the Project development area and includes the area to be used for the establishment of wind turbines, access roads, electrical collection and distribution system, and O&M facilities. The Project Boundary is the area where landscape features would potentially be directly disturbed due to Project development and operation. The Project Boundary is shown in Figure 1.

3.1.2 Visual Assessment Study Area

Viewing distance zones were measured outward from the Project Boundary to help define the influence of viewing distance and support the determination of a study area for the assessment of visual effects to viewers outside of the Project Boundary. Viewing distances affect the level of visible detail perceived by a viewer such that elements of the landscape are more discernible and prominent the closer they are to the observer (CESA 2011). Consequentially, as viewing distance from the Project increases, sensitivity to visual disturbance decreases as it is less likely to be discernable. The determination of a study area is typically dependent on the regional characteristics of the landscape (e.g., topography), the size of the wind project, and location of important local and regional scenic resources, but it is accepted that most significant effects are likely to occur within closer proximity based on visibility thresholds for wind projects (University of Newcastle 2002, Sinclair 2001, CESA 2011). Viewing distance zones for this assessment were defined as foreground (less than ¼ mile), middle-ground (¼ mile to 5 miles), and background (greater than 5 miles).[1]

The study area was designated at a 5-mile buffer of the Project Boundary to capture local effects of the Project on landscape within foreground and middle-ground viewing distances where visual details are most easily discernible by viewers. This is generally consistent with FEIS and FSEIS findings that identify visual impacts generally occurring from viewpoints located within 4 miles from the Project.

The FEIS defined the maximum visible extent of the Project based on viewshed analysis; the area within which a viewer would have an unobstructed sightline of the Project (see FEIS Section 3.10.1.3). Based on the maximum turbine envelope evaluated in the FEIS, the maximum visible area may be larger for the current proposed Project configuration due to the increased size of turbine (up to 492 feet). Within background viewing distances the Project may be visible, but likely less discernible than at foreground and middle-ground viewing distances and would likely be visible as a minor element in views, or be hidden by atmospheric conditions (e.g., haze or dust) and intervening topography.

3.1.3 Project Phases

The Project is defined as having the following three phases:

- Construction Phase – the period from the start of construction to the start of operation (approximately 9 months);
- Operation and Maintenance Phase - encompasses operation and maintenance activities throughout the life of the Project, which is anticipated to be 30 years; and
- Decommission Phase - the period that the Certificate Holder decides to terminate operation of the Project, which is assumed to be beyond the 30 years of the Operation Phase.

The assessment of Project visual effects considers effects that occur during these three phases. The scale and character of Project-related changes to the existing visual landscape are anticipated to be cumulative reaching their full extent at the commencement of operations. Consequently, the Operation and Maintenance Phase is anticipated to result in an effect to visual quality that will represent the largest extent and long-term viewing conditions likely to be experienced by viewers, and will be the focus of the assessment of Project-related visual effects.

[1] The definition of viewing distance for this assessment deviates from those defined in the FEIS as they considered the increased height of the turbines and general visibility thresholds for viewing wind projects.

3.2 Information Sources

A review of existing information was conducted to support the characterization of existing conditions and assessment of potential Project-related visual effects. Information sources used for this assessment includes:

- The FEIS (Section 3.10 and Appendix G) and FSEIS (Section 3.4) reporting and analysis related to visual resources (Kittitas County 2004, EFSEC 2009);
- The 2018 SCA Amendment, February 2018 Revised Project Description, and SEPA checklist for the Project (Section B.10) (EDF Renewable Energy 2018a, Perkins Coie LLP 2018, Desert Claim Wind Power LLC. 2018);
- Environmental Impact Statements for other nearby wind project proposals including Kittitas Valley Wind Power Project (Section 3.9 – Visual Resources) and the Wild Horse Wind Power Project (Section 3.10 – Visual Resources/Light and Glare) (EFSEC 2007, Sagebrush Power Partners LLC 2009, EFSEC 2009, David Evans and Associates Inc. 2009);
- Kittitas County's Comprehensive Plan, Washington State Scenic and Recreational Highways Strategic Plan and related scenic corridor mapping (Kittitas County 1991, Kittitas County 2002a, Kittitas County 2002b, WSDOT 2009, FHWA n.d.);
- Truescape Limited photos and simulations (APPENDIX A, from EDF Renewable Energy 2018b), and Statement of Methodology (see APPENDIX B); and
- Spatial data provided by the Certificate Holder that included the Project Boundary and locations of key viewing locations.

Visual analysis for the FEIS and FSEIS was based on assessment methods employed by the U.S. Department of Transportation Federal Highway Administration (FHWA). The FHWA approach is an established technical methodology that provides a set of guidelines for conducting visual inventories and visual analysis for proposed highway and related infrastructure projects. It is based on public perception research and professional techniques and includes a range of objective criteria for the inventory, analysis, and mitigation of changes to visual quality. However, current visual assessment processes from the Clean Energy States Alliance (CESA) specific to wind energy projects are available to support effective state and local policies, practices, and methods to evaluate associated visual impacts (CESA 2011). This assessment is designed to meet the requirements of the CESA framework for visual impact assessments and elements of the CESA process are incorporated into this assessment to supplement the previous analysis. Cumulatively, this establishes an assessment approach that builds on existing methodologies for evaluating scenic qualities and visual effects of development projects, and addresses the unique visual characteristics of wind energy projects with a process that is logical and systematic.[2]

3.3 Existing Visual Conditions

3.3.1 Regulatory Setting

Under the Kittitas County Comprehensive Plan (Kittitas County 2002a), the land within the Project Boundary is designated as Rural, while under the County's Zoning Code (Kittitas County 1991, Kittitas County 2002b), the

[2] A key assumption of the visual assessment approaches applied to the Project are that they identify important visual characteristics of the surrounding landscape and Project features as the basis for determining how and to what degree a particular project will affect scenic values and do not to address issues of aesthetic appeal, viewer preference, or concepts of beauty.

Project Boundary is zoned Agriculture-20 and Forest and Range. No specific scenic or visual resource policies are contained in the Comprehensive Plan related to this zoning designation.

A portion of U.S. Route 97 within the study area is a state-designated Scenic and Recreational Highway (WSDOT 2009). This designation indicates a scenic corridor this is managed through policy-level guidance for scenic value. There is no scenic corridor management plan for U.S. Route 97.

The FHWA has designated a 100-mile segment of I-90 from Seattle extending east to Ellensburg as a National Scenic Byway[3] (FHWA n.d.). This highway segment is also a part of the Mountains-to-Sound Greenway which is identified as a scenic, historic, and recreation corridor intended to function as a gateway to the Seattle metropolitan area and a “pathway to nature” for the metropolitan area’s population (Mountains to Sound Greenway Trust 2018).

While there are no specific regulatory requirements or limits associated with the potential visual effects of wind energy development within the study area, the presence of scenic corridor designations indicates that visual quality has a value within the surrounding landscape and the need for development to be evaluated for potential impacts to adjoining areas.

3.3.2 Viewpoint Identification

Visual resources are the natural and built landscape features that compose the surrounding visual environment of a project. The combination of natural landscape features such as land, water, and vegetation patterns, and or cultural modifications to the landscape, such as buildings, roads, and other structures, define an area’s visual character. These visual resources contribute to the public’s experience and appreciation of the landscape.

Within the FEIS, existing visual resources were categorized into discrete Visual Assessment Units (VAU) which are areas that share a common visual character and from which the Project would be significantly visible. Each VAU was documented and characterized referencing photographs gathered during site surveys (see Appendix G of the FEIS).

Locations representing potential viewing opportunities from which the Project would be most visible were identified from the combined results of visibility information and VAU mapping. Representative key views were chosen to reflect viewing opportunities that would be experienced by the largest numbers of people, and views of people who would be most sensitive to visual change. Key views were distributed to reflect the range of viewing distances with an emphasis on publicly accessible viewing opportunities. The FEIS identified 19 viewpoints that were used to assess visual impacts of the Project. See Appendix G - Figure G6 for the location of these key view locations.

Thirteen new viewpoints were identified in the FSEIS to reflect a revised Project configuration and the new proposed turbine height, resulting in 25 total viewpoints used for analysis. Some viewpoints used in the FEIS were eliminated if it was determined that turbines would not be visible with the new layout, and /or where viewpoints were not considered representative of how nearby residents and other viewer groups would experience the project, or where elements in the foreground (such as topography or recent construction) would block the view of turbines. For further description of viewpoints used in the FEIS, see FSEIS Section 3.4.2.2 and Figure 3.4-4.

It was asserted by the Certificate Holder in the SCA Amendment that because the current proposed Project configuration is significantly smaller than in the permitted Project, the number of viewpoints to be used for updated

[3] A National Scenic Byway is defined as a road recognized by the FHWA for intrinsic qualities that include scenic natural and man-made panoramas representing the depth and breadth of scenery in America.

visual simulations of the Project may also be smaller. The Certificate Holder selected viewpoints that reflected a 'worst case' potential for visual effect from locations within close proximity to the Project Boundary. Based on the reduced Project footprint and number of turbines of the current proposed Project configuration, new viewpoints were chosen based on the following factors:

- Viewpoints that provide an overall balanced variety of views of the proposed Project;
- Viewpoints that provide views from publicly accessible roads and/or areas in the vicinity of residential dwellings;
- Viewpoints that consider Project-specific surrounding topography and vegetation; and
- Viewpoints that allow for various orientations of views and lighting conditions (e.g., back-lit, side-lit and front-lit turbines) to address different scenarios of turbine contrast against landscape and sky background.

Seven views from six key viewpoint locations were identified to complete the visual simulations for the proposed Project configuration in the SCA Amendment.[4] All six locations were verified on-site. Table 2 summarizes the key viewpoints location and viewing conditions. See Figure 1 for the location of these key viewpoints.

Table 2: Key Viewpoints

Viewpoint ID	Location	Coordinates (ft)	Elevation (ft)	Viewing Direction (°)	Viewing Distance (mi) / Viewing Distance Zone
VP01b	Cricklewood Lane	N 1597633.2, E 653426.1	2161.2	75.3	0.89 Middle-ground
VP04	Highway 97	N 1599520.1, E 647104.6	2030.5	70.2	0.45 Middle-ground
VP06	Smithson Road	N 1614883.5, E 645263.4	2060.9	336.2	0.14 Foreground
VP10a	Reecer Creek	E 1612133.1, N 659014.2	2466.9	158.3	0.06 Foreground
VP10c	Reecer Creek	N 1612133.1, E 659014.2	2466.9	277.6	0.06 Foreground
VP11-alt	Robbins Road	N 1625337.2, E 648976.5	2157.9	281.9	1.02 Middle-ground
VP12	Robbins Road	N 1626366.3, E 657926.5	2562.9	256.8	1.28 Middle-ground

Notes: VP = viewpoint; ID = identifier; E = easting; N = Northing; ft = feet; ° = degrees, mi = miles; coordinated are provided in State Plane Coordinate Washington South (FIPS 4602) System, NAD83

[4] The viewing location at VP10 includes two separate views related to different viewing directions towards the Project.

Existing viewpoints used in the FEIS and FSEIS to support the permitted Project that did not meet the visual impact criteria describe above were not included in the selection of viewpoints for updated visual simulations. However, comparison of the seven key viewpoints to the 19 viewpoints that were previously assessed in the FEIS, and the 25 viewpoints assessed in the FSEIS, indicates that the key viewpoints are representative of the general location and viewing opportunities of several foreground and middle-ground viewpoints in the FEIS and FSEIS. Based on a review of analysis results in the FEIS and FSEIS and available information for the current Project configuration, omitted viewpoints are predicted to either a) not be applicable to the visual assessment of the current proposed Project configuration (i.e., the Project will no longer be discernible), or b) experience similar visual effects to those previously assessed due to factors such as viewing direction, viewing distance, and/or viewing exposure and sensitivity. The following table provides a summary of the relationship between the key views previously identified in the FEIS and FSEIS and the seven key viewpoints used for this visual assessment and the viewing characteristics determined previously for each location. The seven viewpoints are sufficient to evaluate visual impacts of the Project for the proposed SCA amendment.

Table 3: Existing Assessment Viewpoints and Key Viewpoint Summary

Existing Key View [a]	Primary Viewer Exposure [b]	Primary Viewer Sensitivity [c]	Existing Visual Overall Quality [d]	Level of Visual Impact [e]	Viewing Distance Zone [f]	Key Viewpoint Included in Visual Assessment	Rationale
Visual Assessment Unit 1: Northwest Valley Floor							
1B	Moderate	Moderate	High	Moderate	Middle-ground	n/a	• May experience minor change in effects due to viewing distance (> 4 miles from Project Boundary)
1C	Moderate	Moderate	Moderate	Moderate	Middle-ground	n/a	• Effects likely to remain due to 'moderate' viewer ratings • Would likely experience similar effects to VP04
1D	Moderate	High	Moderate	Moderate	Foreground	n/a	• Effects likely to remain due to new increased turbine height and increased viewing distance to Project Boundary • Would likely experience similar effects to VP10c, but at increased viewing distance
S1H in FSEIS 1A in FEIS	Moderate	High	High	High	Middle-ground	VP11_alt	• Confirmed with simulations from this viewpoint

Existing Key View [(a)]	Primary Viewer Exposure [(b)]	Primary Viewer Sensitivity [(c)]	Existing Visual Overall Quality [(d)]	Level of Visual Impact [(e)]	Viewing Distance Zone [(f)]	Key Viewpoint Included in Visual Assessment	Rationale
S1I in FSEIS 1E in FEIS	Moderate	High	Moderate	High	Foreground	n/a	• Viewing direction in previous assessment would not result in visibility of proposed Project configuration • Would likely experience similar effects to VP06, but at increased viewing distance
S1J in FSEIS 1F in FEIS	Moderate	High	Moderate	Moderate	Foreground	VP06	• Confirmed with simulations from this viewpoint
S1K in FSEIS 1G in FEIS	Low	High	Moderate	High	Foreground	VP10c	• Confirmed with simulations from this viewpoint
S1L	Moderate	High	Moderate	High	Foreground	VP10a	• Viewing direction in previous assessment would not result in visibility of proposed Project configuration • Confirmed with simulations from this viewpoint
S1M	Moderate	High	Moderate	Moderate	Middle-ground	n/a	• Effects likely to remain due to viewer sensitivity • Would likely experience similar effects to VP04, but with slightly different viewing angle

Existing Key View [a]	Primary Viewer Exposure [b]	Primary Viewer Sensitivity [c]	Existing Visual Overall Quality [d]	Level of Visual Impact [e]	Viewing Distance Zone [f]	Key Viewpoint Included in Visual Assessment	Rationale
Visual Assessment Unit 2: Northeast Valley Floor							
2A	Moderate	High	Moderate	None (turbines not visible)	Middle-ground	n/a	• May experience minor change in effects due to viewing distance (> 4 miles from Project Boundary) and viewing direction
2B	Low	Moderate	Moderate	Low	Middle-ground	n/a	• May experience minor change in effects due to viewing distance (> 4 miles from Project Boundary) • Viewer ratings indicates this location is not overly sensitive to visual impacts
2C	Moderate	Moderate	High	Low	Background	n/a	• May not experience change in effects due to viewing distance (> 5 miles from Project Boundary)
Visual Assessment Unit 3: Greater Ellensburg							
3A	Moderate	Moderate	Low	Low	Background	n/a	• May not experience change in effects due to viewing distance (> 5 miles from Project Boundary)

Existing Key View [a]	Primary Viewer Exposure [b]	Primary Viewer Sensitivity [c]	Existing Visual Overall Quality [d]	Level of Visual Impact [e]	Viewing Distance Zone [f]	Key Viewpoint Included in Visual Assessment	Rationale
3B	Low	Low	Low	None (turbines not visible)	Background	- n/a	• May not experience change in effects due to viewing distance (> 5 miles from Project Boundary) • Low level of exposure and sensitivity indicated this location is not overly sensitive to visual impacts
3C	Low	Moderate	High	Moderate	Background	n/a	• May not experience change in effects due to viewing distance (> 5 miles from Project Boundary) • Viewer ratings indicates this location is not overly sensitive to visual impacts
Visual Assessment Unit 4: Yakima River							
4A	Low	Moderate	High	None (turbines not visible)	Background	n/a	• May not experience change in effects due to viewing distance (> 5 miles from Project Boundary) • Viewer ratings indicates this location is not overly sensitive to visual impacts

Existing Key View [(a)]	Primary Viewer Exposure [(b)]	Primary Viewer Sensitivity [(c)]	Existing Visual Overall Quality [(d)]	Level of Visual Impact [(e)]	Viewing Distance Zone [(f)]	Key Viewpoint Included in Visual Assessment	Rationale
Visual Assessment Unit 5: Southwest Valley Floor							
S5B in FSEIS 5A in FEIS	Low	Moderate	Moderate	Low	Background	n/a	• May not experience change in effects due to viewing distance (> 5 miles from Project Boundary) • Viewer ratings indicates this location is not overly sensitive to visual impacts
Visual Assessment Unit 6: Hayward Hill							
6A	Low	High	High	Low	Middle-ground	n/a	• May experience minor change in effects due to viewing distance (> 3 miles from Project Boundary) and high viewing angle • Effects likely to remain due to increased turbine height
S6B	Low	High	Moderate	Moderate	Middle-ground	n/a	• May experience minor change in effects due to viewing distance (> 3 miles from Project Boundary) and high viewing angle • Effects likely to remain due to increased turbine height

Existing Key View [(a)]	Primary Viewer Exposure [(b)]	Primary Viewer Sensitivity [(c)]	Existing Visual Overall Quality [(d)]	Level of Visual Impact [(e)]	Viewing Distance Zone [(f)]	Key Viewpoint Included in Visual Assessment	Rationale
Visual Assessment Unit 7: Dry Creek Slope							
7A	Moderate	Low	Moderate	Moderate	Middle-ground	VP04	• Confirmed with simulations from this viewpoint
S7B	Moderate	Low	Moderate	Moderate	Middle-ground	VP01b	• Confirmed with simulations from this viewpoint (different viewing direction)
S7C	Low	High	High	Moderate	Middle-ground	n/a	• Would likely experience similar effects to VP04
Visual Assessment Unit 8: Table Mountain Slope							
S8C in FSEIS 8A from FEIS	Low	High	High	Moderate	Middle-ground	n/a	• May experience minor change in effects due to viewing distance (> 3 miles from Project Boundary) and high viewing angle • Would likely experience similar effects to VP12, but with different viewing angle

Existing Key View [(a)]	Primary Viewer Exposure [(b)]	Primary Viewer Sensitivity [(c)]	Existing Visual Overall Quality [(d)]	Level of Visual Impact [(e)]	Viewing Distance Zone [(f)]	Key Viewpoint Included in Visual Assessment	Rationale
S8D replaced 8B from FEIS	High	High	Moderate	Moderate	Middle-ground	VP12	• Confirmed with simulations from this viewpoint
S8E	Moderate	High	Moderate	Moderate	Middle-ground	n/a	• Effects likely to remain due to moderate / high viewer ratings • Would likely experience similar effects to VP01b, but with different viewing angle

Note: n/a = not applicable

a) Adapted from Table 3.4-1 (Summary of Impacts by Visual Assessment Unit and Viewpoint) of the FSEIS
b) See Table 3.10-2 in the FEIS for definitions of viewer exposure ratings
c) See Table 3.10-3 in the FEIS for definitions of viewer sensitivity ratings
d) See Table 3.10-4 in the FEIS for definitions of visual quality ratings
e) See Table 3.10-5 in the FEIS for definitions of visual impact ratings)
f) Viewing distances and viewing distance zones are based on those defined in this visual assessment (Section 3.1.2)

3.3.3 Existing Visual Quality

Information provided in the FEIS and FSEIS to establish the existing viewing conditions of the Project area was accomplished using guidance from the FHWA approach (see Section 3.2). A description of the existing conditions of the landscape for each VAU was presented in the FEIS along with related ratings for the exposure and sensitivity of the various viewer groups in each unit (see Section 3.10.1.6 and Appendix G). Viewer groups are classes of viewers that differ in their expected response to the Project and its visual environment. Viewer group responses are affected by their exposure (i.e., number of people expose to the project and typical viewing duration) and sensitivity (i.e., degree to which viewers are receptive to visual change based on the activity and awareness of the surrounding visual landscape and character). Refer to FEIS Section 3.10.1.5 and Appendix G for explanation of these terms as well as ratings for each VAU and related key viewpoints.

The existing visual quality was evaluated for each VAU based on the degree to which a view expresses the character of the Kittitas Basin landscape and the inherent capacity of the landscape to evoke a perceptual response. The visual quality of key views from each unit was described and rated in the FEIS using criteria to characterize dimensions of vividness, intactness, and unity of the view. Refer to FEIS Section 3.10.1.6 and Appendix G for explanation of these terms as well as ratings for each VAU and related key viewpoints.

3.4 Visual Assessment

3.4.1 Photo Simulations

Photo simulations of the proposed Project, which electronically superimpose proposed wind turbines on photographs of the landscape, were developed for the seven key viewpoints using the TrueView™ method. A TrueView™ photo simulation is a high resolution, true scale format simulation that represents the primary human field of view that would be seen from the photo location and viewing position. This involved the collection of photographs and reference information collected during photo surveys of the Project area. A digital SLR camera was used to take landscape photography. The exact position of the camera was survey fixed and additional reference points were gathered during the site visit so that a 3D model of the Project could be accurately placed into the photograph. Using 3D computer simulation software, the survey fixed photo for each key viewpoint was incorporated into the computer model and correctly aligned to match the reference points. The Project was then modelled in 3D in accordance with all dimensions, site layouts, colors and textures. The results are photo simulations which accurately depict the proposed Project as it may be viewed from key viewpoints.

The ‘Existing View’ photos and ‘Proposed View’ simulations for each viewpoint are presented in APPENDIX A. See APPENDIX B - Truescape - Statement of Methodology for further details on the TrueView™ process.

Seven TrueView™ photo simulations from the six key viewpoint locations were developed depicting two different layout options of Vestas and Siemens turbine types from each viewpoint. These consist of:

- **Layout 110 – Vestas** - which represents the Certificate Holder’s Vestas 100MW Turbine Layout illustrated in Figure F-6 of the RA. This proposed configuration has more turbines than the alternative layouts and includes the tallest turbines under consideration (the Vestas V136) at 192 feet. The Vestas 100MW Turbine Layout in Figure F-6 can be considered a “worst-case” Vestas layout.
- **Layout 114 – Siemens** - which represents the Certificate Holder’s Siemens 80MW Turbine Layout illustrated in Figure F-8 of the RA.

Photo simulations for the alternative Vestas 80MW Turbine Layout were not developed, however, as this layout shares similarities in location of turbines, as well as relative size and form of towers, but involves 25 Vestas turbines rather than 30, it is considered to have less potential effect than 100 MW Vestas Layout. The two layouts (i.e., Layout 110 – Vestas and Layout 114 – Siemens) presented in the Truescape photo simulation are adequate to support a visual assessment for the Project as they are sufficiently representative of the three layouts proposed by the Certificate Holder.

3.4.2 Visual Impact Rating

The methodology used to evaluate visual impacts for the FEIS and FSEIS are described in detail in FEIS Section 3.10 and Appendix G. In general, the technical visual assessment methods used for the previous assessments were based on guidance from the FHWA approach (see Section 3.2). For each key view used in the FEIS and FSEIS, the photo of the existing view was compared with a simulated view of the Project to determine the changes to visual quality based on dimensions of vividness, intactness and unity. The overall level of visual change caused by the Project was assessed for the degree of compatibility or contrast that occurs between the existing view and the Project and a rating of the level of visual impact for each view was assigned[5]. Appendix G of the FEIS and Section 3.4 of the FSEIS include sets of existing and simulated images for each of the key views used as reference for this assessment. Appendix G of the FEIS also provides detailed documentation of the operation period impact assessment for each VAU.

While it is appropriate to use the degree of contrast with the surrounding landscape as evaluation criteria of visual effects, due to the inherent characteristics of wind turbines (e.g., large scale towers, moving blades) and their siting requirements (e.g., along ridgelines, open areas), additional criteria may also be used to evaluate the degree of visual dominance to understand how a project may be experienced for its overall visibility within its landscape and viewing context (CESA 2011). Visual dominance occurs when a project creates a focal point that detracts from other important existing natural or cultural features and may cause a change in the character of the surrounding landscape. The CESA approach provides guidance to assess the potential degree of dominance of a wind project and describes the factors that affect the degree of dominance including proximity to viewer, duration of view and expectations for a natural setting.

A visual effect rating was completed for each key viewpoint, considering the three possible turbine configurations, to determine to what degree the Project would create a visual change in the landscape and affect the existing level of visual quality experienced by potential viewers. Table 4 defines the visual effects ratings used based on definitions for impact level rating in Table 3.10-5 of the FEIS and consideration of the degree of dominance. The rating for each key viewpoint is based on a review of the existing visual quality ratings and simulations from corresponding key views in the FSEIS, and on comparison of ‘Existing Views’ and ‘Proposed View’ simulation images in APPENDIX A.

[5] The assessment was conservative in that the visibility of even a single turbine at any distance was presumed to have at least a low impact.

Table 4: Level of Visual Effect Rating

Visual Effect Rating	Description
High	Project features may be dominant and/or visible in areas with high viewer exposure or sensitivity and overall visual quality is substantially decreased.
Moderate	Project features may be prominent and/or visible in areas with moderate to high viewer exposure or sensitivity and overall visual quality is moderately decreased.
Low	Project features may be noticeable and/or visible in areas with low viewer exposure and sensitivity and overall visual quality is minimally decreased.

4.0 ASSESSMENT RESULTS

4.1 Existing Visual Conditions

4.1.1 Landscape Character

The Project is situated within the northern portion of the Kittitas Basin, a broad valley of the Yakima River between Lookout Mountain and the Yakima Canyon. The terrain within the Project area is relatively flat and open, with a gradual rise in elevation across most of the Project area ranging from approximately 2,100 feet in the south to 2,500 feet above sea level in the north. Several small, gently sloping creeks flow generally north-to-south across the Project area, forming shallow depressions. While the existing vegetative cover in most of the valley is dominated by agriculture land use, patches of native shrub-steppe or grassland vegetation remain around the outer edges of the valley.

The Project area is in a relatively lightly populated rural area of Kittitas County and is characterized primarily by agricultural uses including feed crops and pastures. Rural residential development occurs in a number of locations, including farm or ranch properties and a few small clusters of homes. Six high-voltage transmission lines and numerous local and regional roadways, including Highway 90, Highway 97, Smithson Road, and Reecer Creek Road, overlap the study area. The Sagebrush and Swauk Valley wind projects are evident in the northwest portion of the study area. Wenatchee National Forest lands are located north of the Project area and are used for recreation, grazing and commercial forestry. Members of the Yakama Nation hunt, gather plants, and conduct other traditional activities in the vicinity of the Project area, pursuant to reserved treaty rights applicable to ceded lands. The private lands of the Project area are not open to general public use. Some low-intensity outdoor recreational uses, including hunting, horseback riding, snowmobiling and off-road vehicle use, occur with the permission of individual landowners.

4.1.2 Existing Visual Quality

Photographs and related information from key viewpoints are included in APPENDIX A. Table 5 summarizes the viewer exposure, viewer sensitivity, and the existing visual quality ratings of key viewpoints and their representative VAU based on rating established for corresponding key view locations in the FSEIS.

Table 5: Existing Visual Quality of Key Viewpoints

Viewpoint ID	Visual Assessment Unit	Primary Viewer Exposure Rating	Primary Viewer Sensitivity Rating	Existing Visual Overall Quality Rating
VP01b	Visual Assessment Unit 7: Dry Creek Slope	Moderate	Low	Moderate
VP04		Moderate	Low	Moderate
VP06	Visual Assessment Unit 1: Northwest Valley Floor	Moderate	High	Moderate
VP10a		Moderate	High	Moderate
VP10c		Low	High	Moderate
VP11-alt		Moderate	High	High
VP12	Visual Assessment Unit 8: Table Mountain Slope	High	High	Moderate

Notes: VP = viewpoint; ID = identifier; refer to FEIS Section 3.10.1.5, Section 3.10.1.6, and Appendix G for explanation of ratings

4.2 Visual Assessment

4.2.1 Construction and Decommission Phases

Based on the description of Project components and activities summarized in Section 2.2, and assessment results in the FEIS, visual effects are expected to occur during the Construction and Decommission phases and continue incrementally over the full period of these phases, creating temporary changes in the existing visual quality of the study area.

Construction activities are anticipated to last approximately 9 months and visual effects would be related to the introduction of construction equipment and activities during this period. Bulldozers, cranes, flatbed trucks, and other heavy equipment would be visible in views toward the Project Boundary. Activity related to the construction of access roads, tower foundations, power collection system and communication lines, and the substation will involve crews working progressively in localized areas of the Project Boundary. The construction of the turbines, involving the erecting of towers and assembly of nacelles and blades, would follow and consist of the use of large construction cranes which would be prominently visible during the period of this activity. There is the potential for visual effects related to dust from construction activities that would contrast with the surrounding landscape. This effect would likely be most evident during construction for roads, tower foundations, and vegetation clearing.

Re-vegetation of temporary disturbance width along the access roads, around turbine pads areas, and at temporary laydown or staging areas will be re-established through re-contouring and re-vegetation after construction is completed. It is anticipated that the natural appearance of these disturbed areas will develop over time.

Decommissioning of the Project, or individual turbines during operations, would involve the removal of wind turbines, foundations, cables, access roads and other facilities and the re-establishment of the natural appearance of these disturbed areas. Similar to construction, visual effects of decommissioning would be related to the introduction of equipment (i.e., cranes) and activities used for removal of Project built structures, and earthworks such as re-contouring. At the end of the decommission period, the removal of turbines and other Project facilities will result in a reduction of the evidence of industrial wind energy development within the study area.

Most construction and decommissioning activities and components would likely be visible only to those viewers adjacent to the work sites (e.g., viewers along Smithson Road and at nearby residences) with a localized effect on the immediate landscape setting that would be experienced by viewers for a relatively short duration (i.e., weeks to months). Overall, the visual changes associated with the Construction and Decommission phases would have a ‘moderate’, but temporary, visual effect on views from nearby residences and roads. Due to the anticipated physical and temporary scale of construction equipment and activities and the limited exposure of most viewers not adjacent to the Project Boundary, the visual effect of construction and decommissioning activities and components would be considered ‘low’ for viewers located at more distant viewpoints.

The temporary visual effects of construction and decommission will be fully mitigated after the conclusion of activity, with the removal of equipment, and the re-establishment of the natural appearance of disturbed areas. As a result, the temporary visual effects of construction and decommissioning are not expected to have a lasting effect on visual quality of in the study area. The erection of turbines, development of related Project built structures (e.g., O&M facilities, Project substation, meteorological towers), and vegetation clearing along new access roads and at tower foundation has the potential to create visual effects that will last beyond construction and into the Operation and Maintenance Phase.

4.2.2 Operation and Maintenance Phase

Based on the description of Project components and activities summarized in Section 2.2, and assessment results in the FEIS, and assessment of simulated views of the Project, visual effects are predicted to be caused primarily by the presence of visible turbines, and the potential visibility of related Project built structures (e.g., O&M facilities, Project substation, meteorological towers) and vegetation clearing, creating long-term visual changes to the existing visual quality of the study area.

Previous analysis of proposed Project configurations in the FEIS and FSEIS generally concluded that while long-term visual impacts would vary with viewer location and proximity, the Project would be most apparent to, and have the highest degree of visual impact on, observers closest to the turbines and particularly those within foreground and a portion of middle-ground viewing distances (i.e., viewpoints within approximately ¼ or ½ mile). It was determined that the turbines would be visually prevalent due to their size, numbers and arrangement. Revised configurations presented in the FSEIS were determined to reduce the number of residences that would be located close to proposed turbines, however, visual impacts associated with the Project remained. It was also determined that the height of the turbines was the major factor affecting long-term visual impacts, and that visual impacts generally decreased with increasing viewing distance resulting in a reduction in the perceived scale of the turbines and potential for the proposed Project to blend with the landscape setting. Overall, the level of visual impact in the FSEIS was considered to be ‘moderate’ from high angle views and at moderate distances from the Project (i.e., 1 to 4 miles). With greater distance from the viewer, the turbines occupy less of the view and were considered to blend with the disturbance of powerlines, fences, and suburban development that existed in the foreground of many views (e.g., Ellensburg). Consequently, these views were assigned ‘low’ impact ratings.

Other components of the Project including roads, O&M facilities, the Project substation and meteorological towers, were determined to be much smaller than the wind turbines, and were considered to be visible only from the immediate surrounding area. Mitigation measures were provided for these components that would assist their blending with their surrounding landscape to reduce potential visual effects. As a result, it was determined that these components would have a minor impact on the visual quality of the landscape setting.

The analysis in this visual assessment seeks to evaluate proposed changes from the Project represented in the simulations from key viewpoints, and identify any different visual effects associated with those changes from the previous assessment of the permitted Project. Applying the technical methodology described in Section 3.4, ratings of the Project's level of visual effect were determined for each key viewpoint and the three possible turbine configurations. Table 6 summarizes the visual effects ratings and rationale for the rating predicted at each key viewpoint. It also provides the previous level of visual impact assessed in the FSEIS for the corresponding key view location to identify any change in the visual effects associated with the Project configuration in the RA. The location of key viewpoints is shown on Figure 1. 'Existing Views' and 'Proposed View' simulation images used to assign ratings are presented in APPENDIX A.

Table 6: Visual Effects Rating of Key Viewpoints

Viewpoint ID	FSEIS Level of Visual Impact [(a)]	Level of Visual Effect	Rationale
VP01b	Moderate	**Vestas 100MW Turbine Layout / Vestas 80 MW Layout / Siemens 80MW Turbine Layout**	
		Moderate	• View of turbines is mostly obstructed by landform from this viewing direction(b) • Fewer turbines are likely to be less visible than previous Project configurations due to screening by landform • Project feature would be distinct and would attract viewer attention • Viewers are considered to have 'moderate' exposure and 'low' sensitivity; there are existing turbines visible from this location in different viewing direction
VP04	Moderate	**Vestas 100MW Turbine Layout / Vestas 80 MW Layout / Siemens 80MW Turbine Layout**	
		Moderate	• Project features would be distinct and would attract viewer attention • Fewer turbines are visible than previous Project configurations • Turbines appear slightly larger in scale but are no more prominent • Viewers are considered to have 'moderate' exposure and 'low' sensitivity; there are existing turbines visible from this location in different viewing direction

Viewpoint ID	FSEIS Level of Visual Impact [(a)]	Level of Visual Effect	Rationale
VP06	Moderate	**Vestas 100MW Turbine Layout / Vestas 80 MW Layout / Siemens 80MW Turbine Layout**	
		Moderate	• Project features would be distinct and would attract viewer attention • Fewer turbines are visible than previous Project configurations • Turbine appear slightly larger in scale but are no more prominent • Viewers are considered to have 'moderate' exposure and 'high' sensitivity; there are existing turbines visible from this location
VP10a	High	**Vestas 100MW Turbine Layout / Vestas 80 MW Layout / Siemens 80MW Turbine Layout**	
		Moderate	• Project features would be distinct and would attract viewer attention • Fewer turbines are visible than previous Project configurations • Turbines appear less prominent than previous Project configuration • Viewers are considered to have 'low' exposure and 'high' sensitivity; there are existing turbines visible from this location in different viewing direction
VP10c	High	**Vestas 100MW Turbine Layout / Vestas 80 MW Layout**	
		Moderate	• Project features would be distinct and would attract viewer attention • Fewer turbines are visible than previous Project configurations • Turbines appear similar in scale to previous Project configuration • Viewers are considered to have 'moderate' exposure and 'high' sensitivity; there are existing turbines visible from this location
		Siemens 80MW Turbine Layout	
		Moderate	• Project features would be distinct and would attract viewer attention • Fewer turbines are visible than previous Project configurations • Turbines appear less prominent than previous Project configurations

Viewpoint ID	FSEIS Level of Visual Impact [(a)]	Level of Visual Effect	Rationale
			• Viewers are considered to have ‘moderate’ exposure and ‘high’ sensitivity; there are existing turbines visible from this location
VP11-alt	High	**Vestas 100MW Turbine Layout / Vestas 80 MW Layout / Siemens 80MW Turbine Layout**	
		Low	• Project features would be very small in size requiring extended viewing to be discernable • Viewers are considered to have ‘moderate’ exposure and ‘high’ sensitivity; there are existing turbines visible from this location
VP12	Moderate	**Vestas 100MW Turbine Layout / Vestas 80 MW Layout / Siemens 80MW Turbine Layout**	
		Low	• Project features would be small in size and would be indistinct feature to viewers • Fewer turbines are visible than previous Project configurations • Turbines appear similar in scale to previous Project configuration despite increased viewing distance • Viewers are considered to have ‘high’ exposure and ‘high’ sensitivity there are existing turbines visible from this location (background)

Notes: VP = viewpoint; ID = identifier; MW = megawatt; see Table 3.10-5 of the FEIS for definition of visual impact ratings; see Table 4 for definition of visual effect ratings; refer to FEIS Section 3.10.1.5, Section 3.10.1.6, and Appendix G for explanation of viewer ratings
(a) based on previously proposed Project configurations in the FSEIS
(b) from review of the Project layout configuration and viewing direction of this viewpoint, there is the potential for visibility of turbines outside of the field of view represented in the simulation which may not be screened. As a result, the visibility of Project features was assessed conservatively

The key viewpoints showing the greatest degree of visual impact remain within the Northwest Valley VAU with ‘moderate’ rating of visual effects. From key viewpoints in this VAU the Project features (i.e., turbines) will likely appear distinct and would attract viewer attention resulting from unobstructed views within close proximity to the Project and with ‘moderate’ to ‘high’ viewer exposure or sensitivity ratings.

While three viewing locations retain the same level of visual effect as assessed in the FSEIS, there is a notable reduction in visual effects from the current proposed Project configuration at four viewing locations compared to previous Project configurations despite an increase in the size of turbines. This is due primarily to the decreased number of turbines from approximately 90 to approximately 31, which results in less horizontal area being visually disturbed by Project features, and the generally consistent scale of Project features within the landscape resulting from increased viewing distance of the turbines from viewers.

Based on the visual effect analysis of the Project for the seven key viewpoints identified in this assessment, as well as the review and evaluation of information available in the FEIS and FSEIS visual assessments, the assertion from the Certificate Holder that the Project proposed in the SCA Amendment would reduce visual impacts relative to the permitted Project is considered to be valid. Scenic byway and highway corridors within the study area do not have specific regulatory requirements or limits associated with the potential visual effects; however, their designations indicate the value of visual quality within the surrounding landscape (Section 3.3.1). The level of visual effects determined in the FSEIS and within this assessment are considered to be 'low' to 'moderate' for locations related to scenic corridors within the study area. Where Project features are visible, views from I-90 would likely experience a minimal change to the existing visual quality as the scenic corridor is located within a viewing distance of approximately 4.0 miles from the Project and visual details are less likely to be discernable by viewers. Views from some locations along U.S. Route 97, particularly those near the Project Boundary, may experience moderate change to the existing visual quality due to the Project features that would appear distinct and would attract viewer attention. While visible from some locations related to scenic corridors, Project features would not cause a change in the overall character of the surrounding landscape, which includes existing wind developments, and consequentially there would be no substantial effect to the scenic value of the portions of scenic corridors within the study area.

4.3 Mitigation Measures

Because of its exposed location and the operational requirements for wind turbines (i.e., most commercial wind energy systems are located in open rural or natural areas), mitigation measures available to address the visual effects of the Project are limited. The potential for visual effects of the Project have been reduced in a number of ways throughout the previous Project configurations in the FEIS and the FSEIS. These include the following mitigation measures which are currently reflected in the SCA Amendment design:

- A smaller footprint and more contiguous project area;
- Reduction in the number of turbines and increased turbine density;
- Increased distances between turbines and neighboring residences (i.e. Located at least 2,500 feet from residences);
- Reduced number of meteorological towers; and
- Reduced length of roads.

In order to minimize visual effects during Project construction and operation / maintenance, the Certificate Holder also proposes to complete the following to the extent feasible:

- Replace native vegetation disturbed in non-road surface areas or non-turbine areas as soon as possible;
- Seed or cover temporarily stockpiled materials and disturbed sites that will sit dormant for more than 3 months to keep down dust and prevent soil erosion;
- Periodic removal of construction debris;
- Construct Project buildings of local materials and in local building styles to maximize their fit in the vernacular landscape;
- Use native shrub-steppe vegetation around buildings and equipment boxes to integrate the structures into surrounding landscape;
- Use existing roads to access turbines;

- No piggyback advertising, cell antennas, or other clutter on the turbines and no display of the logo of the manufacturer prominently on the turbine nacelle;
- Maintain high-quality turbine towers, nacelles, and blades, and remove or promptly repair all parts of non-functioning turbines; and
- Use low-reflectivity, neutral-color finishes for turbines, and other Project facilities. Earth-tone finish will be used on the O&M Facility to better blend it with the surrounding landscape.

While the above mitigation measures will not fully mitigate the visual effects of the Project, they are considered to be effective as they draw on established best practices for addressing visual effects of wind projects and are appropriate within the context of the existing landscape setting of the Kittitas Basin.

The only additional mitigation measure that is recommended to address potential visual effects identified during Construction and Decommission phases consists of the following:

- Dust control may be required for access roads (i.e., spraying) to minimize the potential visual effect of dust generated from the movement and operation of construction equipment and vehicles.

4.4 Summary of Effects

The Project is located approximately 8 miles north of the central part of Ellensburg, Washington and covers approximately 4,393 acres of land. This northern portion of the Kittitas Basin is relatively flat and open, with a gradual south-to-north rise in elevation. Several small, gently sloping creeks flow across this area, forming shallow depressions. While the existing vegetative cover in most of the valley is dominated by agriculture, patches of native shrub-steppe or grassland vegetation remain around the outer edges. This area is a relatively lightly populated rural area with rural residential development occurring in a number of locations. Numerous transmission lines and local and regional roadways cross the study area, and the Sagebrush and Swauk Valley wind projects are evident in the northwest portion of the study area. Wenatchee National Forest lands are located north of the Project and are used for recreation, grazing and commercial forestry.

In 2010, the Project received a SCA for up to 95 turbines and associated facilities. The revised Project configuration submitted as part of the SCA Amendment includes a maximum of 31 wind turbines distributed across the Project area. The Certificate Holder is currently considering three possible turbine configurations: a 100 MW Vestas Layout, an 80 MW Vestas Layout, and an 80 MW Siemens Layout. Each configuration utilizes different combinations and numbers of commercially available turbines ranging between 262 and 279 feet in hub height and between a maximum height of 440 feet to 492 feet. The Project will also involve the construction and operation of access roads, electrical collection and distribution system, operation and maintenance facilities, and meteorological towers. Decommissioning the Project at the termination of operations (anticipated to be 30 years) will involve removal of the turbines and other facilities and the final restoration of disturbed lands.

The Construction and Decommission phases are predicted to result in visual effects over the full period of these phases, creating temporary changes in the existing visual quality of the study area. Construction activities are anticipated to last approximately 9 months and visual effects would be related to the introduction of construction equipment and activities during this period. Similar to construction, visual effects of decommissioning would be related to the introduction of equipment (i.e., cranes) and activities used for removal of Project built structures, and from earthworks such as re-contouring. The temporary visual effects of construction and decommissioning will be fully mitigated after the conclusion of activity and with the removal of equipment and re-establishment of the natural appearance of disturbed areas. As a result, the temporary visual effects of Construction and Decommission phases are not expected to have a lasting effect on visual quality in the study area.

During the Operations and Maintenance Phase, the presence of turbines, Project related built structures (e.g., O&M facilities, substation, meteorological towers), and vegetation clearing has the potential to create long-term visual changes to the existing visual quality of the study area. Previous analysis of proposed Project configurations in the FEIS and FSEIS generally concluded that while long-term visual impacts would vary with viewer location and proximity, the Project would be most apparent to, and have the highest degree of visual impact on, observers closest to the turbines and particularly those within foreground viewing distance. It was also determined that the height of the turbines was determined to be the major factor affecting long-term visual impacts, and that visual impacts generally decreased with increasing viewing distance. Overall, the level of visual impact in the FSEIS was considered to be ‘moderate’ at moderate distances from the Project (i.e., 1 to 4 miles) and ‘low’ with greater distance from the Project area. The analysis in this visual assessment involved the rating of the Projects level of visual effect for key viewpoints for the three possible turbine configurations illustrated in simulation images of the Projects proposed configuration. From key viewpoints, Project features will likely appear distinct and would attract viewer attention particularly within close proximity to the Project and where there is ‘moderate’ to ‘high’ viewer exposure or sensitivity. While three viewing locations retain the same level of visual effect as assessed in the FSEIS, there is a notable reduction in visual effects from the proposed Project configuration at four viewing locations compared to previous Project configurations despite an increase in the size of turbine. This is due primarily to the decreased number of turbines, and the generally consistent scale of Project features within the landscape resulting from increased viewing distance of the turbines from viewers. Based on the visual effect analysis of the Project for the seven key viewpoints identified in this assessment, as well as the review and evaluation of information available in the FEIS and FSEIS visual assessments, the assertion from the Certificate Holder that the Project proposed in the SCA Amendment would reduce visual impacts relative to the permitted Project is considered to be valid.

Mitigation measures available to address the visual effects of the Project are limited due to its exposed location and the operational requirements. However, the potential for visual effects of the Project have been reduced in a number of ways within the proposed Project configuration by the application of established best practices that are appropriate within the context of the existing landscape setting of the Kittitas Basin.

https://golderassociates.sharepoint.com/sites/10327g/working documents/phase 005c consulting - desert claim/visual effects assessment/final_report_20180907/1544295-005c_visual_effects_final report_20180907.docx

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APPENDIX A

TrueView Photo Simulations - Existing & Proposed

TrueView Photo Simulations - Existing & Proposed
January 2018

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Viewpoint 01b - Cricklewood Lane

Viewpoint 04 - Highway 97

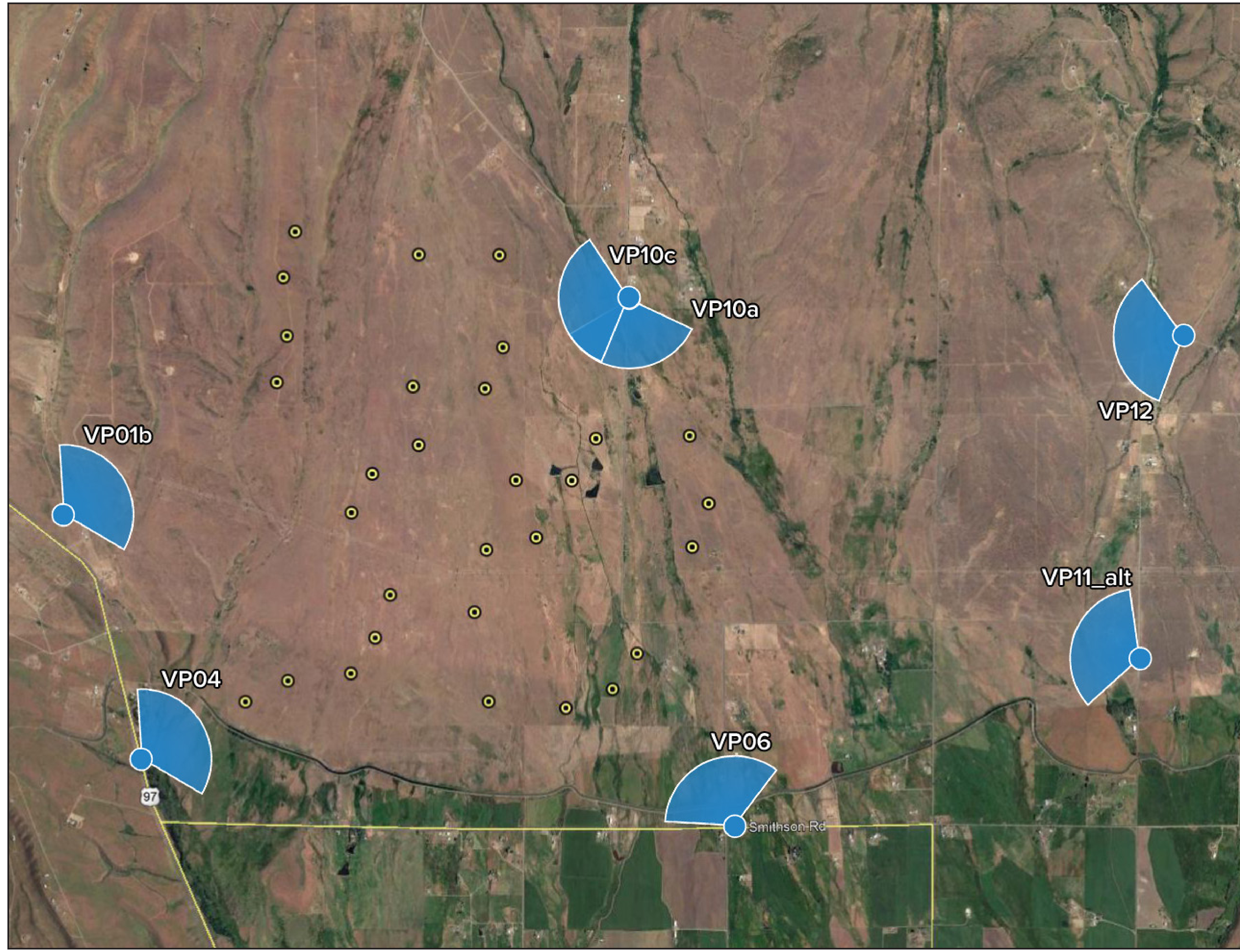
Viewpoint 06 - Smithson Rd

Viewpoint 10a - Reecer Creek Rd

Viewpoint 10c - Reecer Creek Rd

Viewpoint 11_alt - Robbins Rd

Viewpoint 12 - Robbins Rd



Viewpoint Locations - Layout 114 - Siemens

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Viewpoint 01b - Cricklewood Lane

Viewpoint 04 - Highway 97

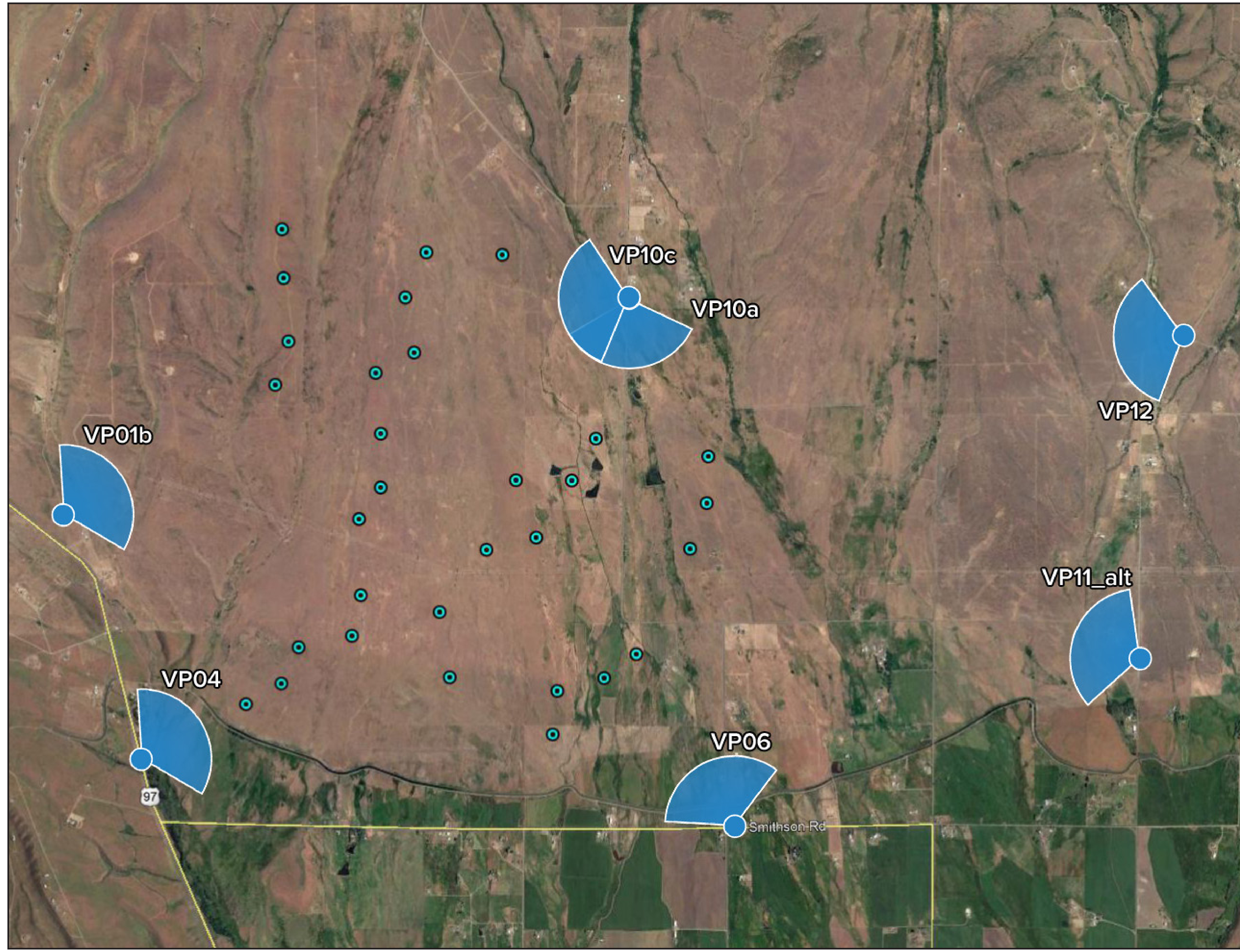
Viewpoint 06 - Smithson Rd

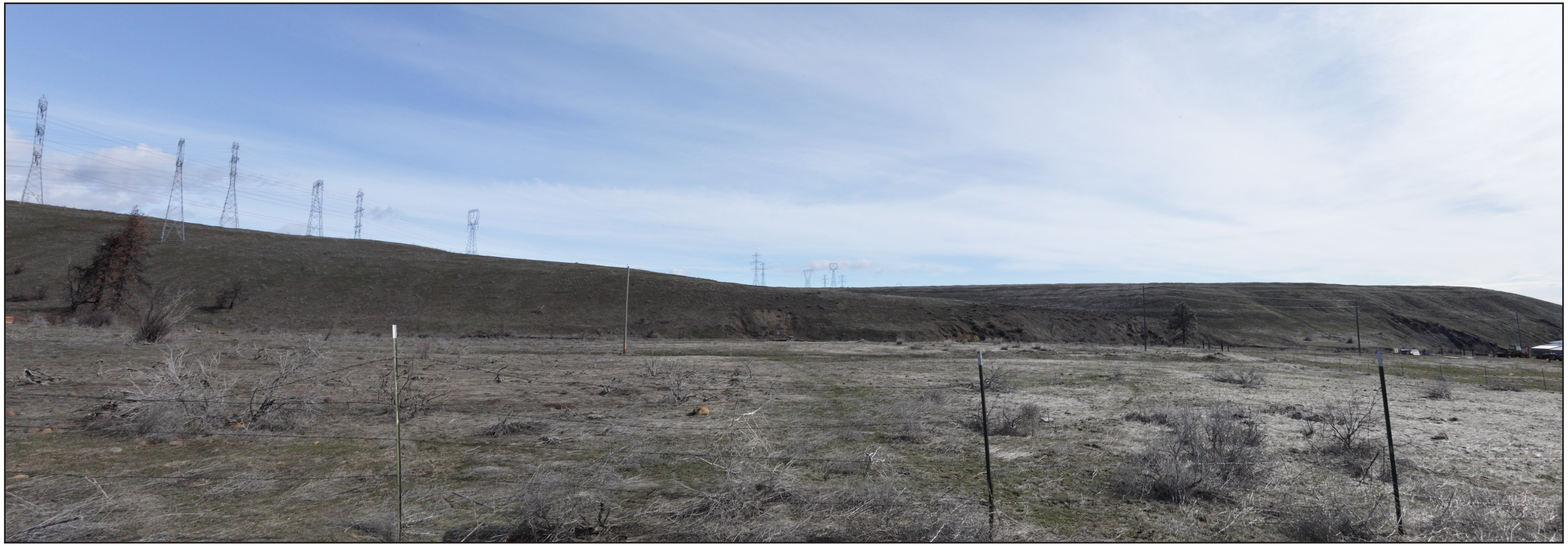
Viewpoint 10a - Reecer Creek Rd

Viewpoint 10c - Reecer Creek Rd

Viewpoint 11_alt - Robbins Rd

Viewpoint 12 - Robbins Rd





Viewpoint VP01b - Cricklewood Lane, Looking East-Northeast - **Existing View**

Viewpoint VP01b - Cricklewood Lane, Looking East-Northeast - **Proposed View - Layout 110 - Vestas**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

EDF renewable energy

Desert Claim Wind Project

Viewpoint VP01b

Cricklewood Lane

Viewpoint Location   Turbine Locations

Easting Position (State Plane Washington South):	**1597633.2**
Northing Position (State Plane Washington South):	**653426.1**
Elevation of Photopoint Position (NAD83):	**2161.2**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**27 February 2016 at 11:48 AM**
Orientation of View:	**ENE**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 110:

Vestas V110 - 2.0MW
Rotor Diameter 110 m / 361 ft

Vestas V136 - 3.45, 4.0 and 4.2MW
Rotor Diameter 136 m / 446 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
Pioneer Surveying and Engineering, Inc.
Goldendale
WA
98620

No part of this photo simulation shall be altered in any way.

Visual assessments should be made from the full size TrueView™ only.

Photo Simulation Created Using
TrueView™ Technology
(Patent No.: US 8,184,906 B2)

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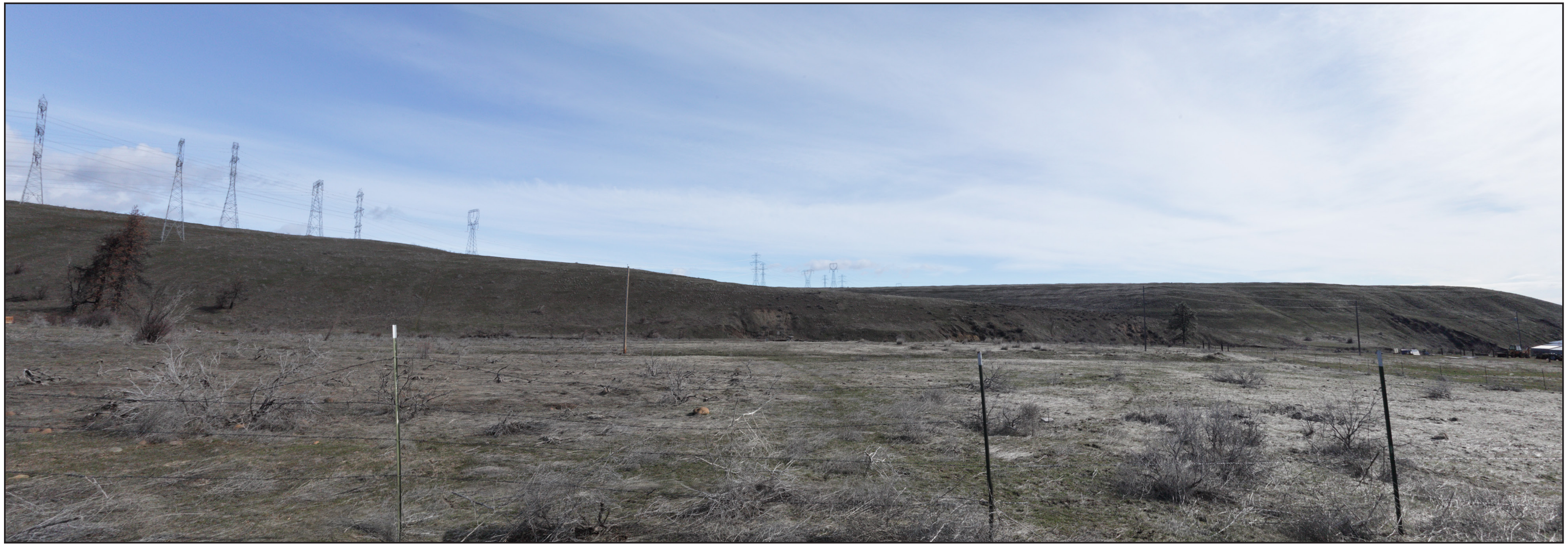
DATE	SHEET
21 December 2017	4



Viewpoint VP01b - Cricklewood Lane, Looking East-Northeast - **Existing View**

Viewpoint VP01b - Cricklewood Lane, Looking East-Northeast - **Proposed View - Layout 114 - Siemens**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

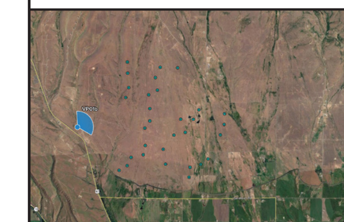
EDF renewable energy

Desert Claim Wind Project

Viewpoint VP01b

Cricklewood Lane

Viewpoint Location · Turbine Locations



Easting Position (State Plane Washington South):	**1597633.2**
Northing Position (State Plane Washington South):	**653426.1**
Elevation of Photopoint Position (NAD83):	**2161.2**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**27 February 2016 at 11:48 AM**
Orientation of View:	**ENE**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 114 :

Siemens 108 - 2.3MW
Rotor Diameter 108 m / 354 ft

Siemens 120 - 2.625MW
Rotor Diameter 120 m / 394 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
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Viewpoint VP04 - Highway 97, Looking East-Northeast - **Existing View**

Viewpoint VP04 - Highway 97, Looking East-Northeast - **Proposed View - Layout 110 - Vestas**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

EDF renewable energy

Desert Claim Wind Project

Viewpoint VP04

Highway 97

Viewpoint Location · Turbine Locations

Easting Position (State Plane Washington South):	**1599520.1**
Northing Position (State Plane Washington South):	**647104.6**
Elevation of Photopoint Position (NAD83):	**2030.5**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**27 February 2016 at 10:44 AM**
Orientation of View:	**ENE**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 110:

Vestas V110 - 2.0MW
Rotor Diameter 110 m / 361 ft

Vestas V136 - 3.45, 4.0 and 4.2MW
Rotor Diameter 136 m / 446 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
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DATE	SHEET
21 December 2017	6

Viewpoint VP04 - Highway 97, Looking East-Northeast - **Existing View**

Viewpoint VP04 - Highway 97, Looking East-Northeast - **Proposed View - Layout 114 - Siemens**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

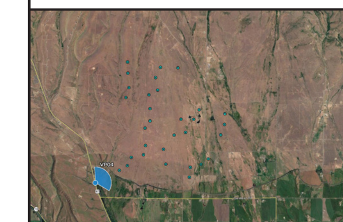
EDF renewable energy

Desert Claim Wind Project

Viewpoint VP04

Highway 97

Viewpoint Location · Turbine Locations



Easting Position (State Plane Washington South):	**1599520.1**
Northing Position (State Plane Washington South):	**647104.6**
Elevation of Photopoint Position (NAD83):	**2030.5**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**27 February 2016 at 10:44 AM**
Orientation of View:	**ENE**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 114 :

Siemens 108 - 2.3MW
Rotor Diameter 108 m / 354 ft

Siemens 120 - 2.625MW
Rotor Diameter 120 m / 394 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
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WA
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DATE	SHEET
21 December 2017	7

Viewpoint VP06 - Smithson Road, Looking North-Northwest - **Existing View**

Viewpoint VP06 - Smithson Road, Looking North-Northwest - **Proposed View - Layout 110 - Vestas**

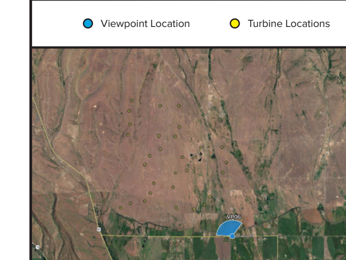
For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

EDF renewable energy

Desert Claim Wind Project

Viewpoint VP06

Smithson Road



Easting Position (State Plane Washington South):	**1614883.5**
Northing Position (State Plane Washington South):	**645263.4**
Elevation of Photopoint Position (NAD83):	**2060.9**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**27 February 2016 at 10:01 AM**
Orientation of View:	**NNW**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 110:

Vestas V110 - 2.0MW
Rotor Diameter 110 m / 361 ft

Vestas V136 - 3.45, 4.0 and 4.2MW
Rotor Diameter 136 m / 446 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
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DATE	SHEET
21 December 2017	8

Viewpoint VP06 - Smithson Road, Looking North-Northwest - **Existing View**

Viewpoint VP06 - Smithson Road, Looking North-Northwest - **Proposed View - Layout 114 - Siemens**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

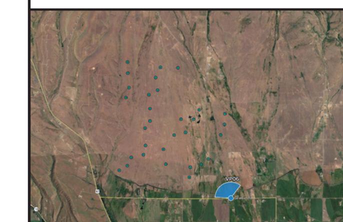
EDF renewable energy

Desert Claim Wind Project

Viewpoint VP06

Smithson Road

Viewpoint Location   Turbine Locations



Easting Position (State Plane Washington South):	**1614883.5**
Northing Position (State Plane Washington South):	**645263.4**
Elevation of Photopoint Position (NAD83):	**2060.9**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**27 February 2016 at 10:01 AM**
Orientation of View:	**NNW**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 114 :

Siemens 108 - 2.3MW
Rotor Diameter 108 m / 354 ft

Siemens 120 - 2.625MW
Rotor Diameter 120 m / 394 ft

NOTES:

Viewpoint locations have been precision surveyed by:

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DATE	SHEET
21 December 2017	9

Viewpoint VP10a - Reecer Creek Rd, Looking South - **Existing View**

Viewpoint VP10a - Reecer Creek Rd, Looking South - **Proposed View - Layout 110 - Vestas**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

edf renewable energy

Desert Claim Wind Project

Viewpoint VP10a

Reecer Creek Rd

Easting Position (State Plane Washington South):	**1612133.1**
Northing Position (State Plane Washington South):	**659014.2**
Elevation of Photopoint Position (NAD83):	**2466.9**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**29 November 2017 at 11:23 AM**
Orientation of View:	**S**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 110:

Vestas V110 - 2.0MW
Rotor Diameter 110 m / 361 ft

Vestas V136 - 3.45, 4.0 and 4.2MW
Rotor Diameter 136 m / 446 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
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DATE	SHEET
21 December 2017	10

Viewpoint VP10a - Reecer Creek Rd, Looking South - **Existing View**

Viewpoint VP10a - Reecer Creek Rd, Looking South - **Proposed View - Layout 114 - Siemens**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

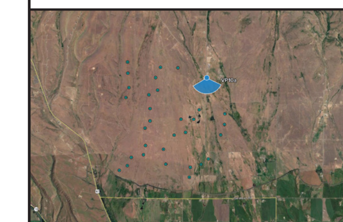
EDF renewable energy

Desert Claim Wind Project

Viewpoint VP10a

Reecer Creek Rd

Viewpoint Location   Turbine Locations



Easting Position (State Plane Washington South):	**1612133.1**
Northing Position (State Plane Washington South):	**659014.2**
Elevation of Photopoint Position (NAD83):	**2466.9**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**29 November 2017 at 11:23 AM**
Orientation of View:	**S**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 114 :

Siemens 108 - 2.3MW
Rotor Diameter 108 m / 354 ft

Siemens 120 - 2.625MW
Rotor Diameter 120 m / 394 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
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DATE	SHEET
21 December 2017	11

Viewpoint VP10c - Reecer Creek Rd, Looking West - **Existing View**

Viewpoint VP10c - Reecer Creek Rd, Looking West - **Proposed View - Layout 110 - Vestas**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

EDF renewable energy

Desert Claim Wind Project

Viewpoint VP10c

Reecer Creek Rd

Viewpoint Location   Turbine Locations

Easting Position (State Plane Washington South):	**1612133.1**
Northing Position (State Plane Washington South):	**659014.2**
Elevation of Photopoint Position (NAD83):	**2466.9**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**29 November 2017 at 11:23 AM**
Orientation of View:	**W**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 110:

Vestas V110 - 2.0MW
Rotor Diameter 110 m / 361 ft

Vestas V136 - 3.45, 4.0 and 4.2MW
Rotor Diameter 136 m / 446 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
Pioneer Surveying and Engineering, Inc.
Goldendale
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DATE	SHEET
21 December 2017	12

Viewpoint VP10c - Reecer Creek Rd, Looking West - **Existing View**

Viewpoint VP10c - Reecer Creek Rd, Looking West - **Proposed View - Layout 114 - Siemens**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

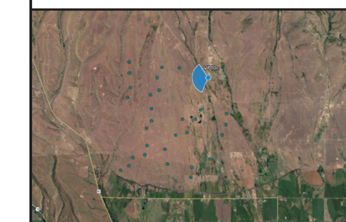
EDF renewable energy

Desert Claim Wind Project

Viewpoint VP10c

Reecer Creek Rd

Viewpoint Location   Turbine Locations



Easting Position (State Plane Washington South):	**1612133.1**
Northing Position (State Plane Washington South):	**659014.2**
Elevation of Photopoint Position (NAD83):	**2466.9**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**29 November 2017 at 11:23 AM**
Orientation of View:	**W**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 114 :

Siemens 108 - 2.3MW
Rotor Diameter 108 m / 354 ft

Siemens 120 - 2.625MW
Rotor Diameter 120 m / 394 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
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Visual assessments should be made from the full size TrueView™ only.

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DATE	SHEET
21 December 2017	13

Viewpoint VP11alt - Robbins Rd, Looking Northwest - **Existing View**

Viewpoint VP11alt - Robbins Rd, Looking Northwest - **Proposed View - Layout 110 - Vestas**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

EDF renewable energy

Desert Claim Wind Project

Viewpoint VP11alt

Robbins Rd

Viewpoint Location   Turbine Locations

Easting Position (State Plane Washington South):	**1625337.2**
Northing Position (State Plane Washington South):	**648976.5**
Elevation of Photopoint Position (NAD83):	**2157.9**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**29 November 2017 at 10:23 AM**
Orientation of View:	**NW**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 110:

Vestas V110 - 2.0MW
Rotor Diameter 110 m / 361 ft

Vestas V136 - 3.45, 4.0 and 4.2MW
Rotor Diameter 136 m / 446 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
Pioneer Surveying and Engineering, Inc.
Goldendale
WA
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No part of this photo simulation shall be altered in any way.

Visual assessments should be made from the full size TrueView™ only.

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DATE	SHEET
21 December 2017	14

Viewpoint VP11alt - Robbins Rd, Looking Northwest - **Existing View**

Viewpoint VP11alt - Robbins Rd, Looking Northwest - **Proposed View - Layout 114 - Siemens**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

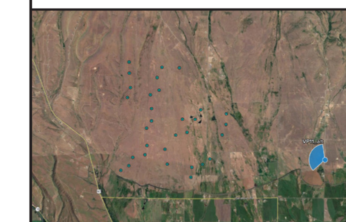
EDF renewable energy

Desert Claim Wind Project

Viewpoint VP11alt

Robbins Rd

Viewpoint Location   Turbine Locations



Easting Position (State Plane Washington South):	**1625337.2**
Northing Position (State Plane Washington South):	**648976.5**
Elevation of Photopoint Position (NAD83):	**2157.9**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**29 November 2017 at 10:23 AM**
Orientation of View:	**NW**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 114 :

Siemens 108 - 2.3MW
Rotor Diameter 108 m / 354 ft

Siemens 120 - 2.625MW
Rotor Diameter 120 m / 394 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
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DATE	SHEET
21 December 2017	15

Viewpoint VP12 - Robbins Rd, Looking West - **Existing View**

Viewpoint VP12 - Robbins Rd, Looking West - **Proposed View - Layout 110 - Vestas**

For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

EDF renewable energy

Desert Claim Wind Project

Viewpoint VP12

Robbins Rd

Viewpoint Location Turbine Locations

Easting Position (State Plane Washington South):	**1626366.3**
Northing Position (State Plane Washington South):	**657926.5**
Elevation of Photopoint Position (NAD83):	**2562.9**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**29 November 2017 at 10:18 AM**
Orientation of View:	**W**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 110:

Vestas V110 - 2.0MW
Rotor Diameter 110 m / 361 ft

Vestas V136 - 3.45, 4.0 and 4.2MW
Rotor Diameter 136 m / 446 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
Pioneer Surveying and Engineering, Inc.
Goldendale
WA
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No part of this photo simulation shall be altered in any way.

Visual assessments should be made from the full size TrueView™ only.

DATE	SHEET
21 December 2017	16

Viewpoint VP12 - Robbins Rd, Looking West - **Existing View**

Viewpoint VP12 - Robbins Rd, Looking West - **Proposed View - Layout 114 - Siemens**

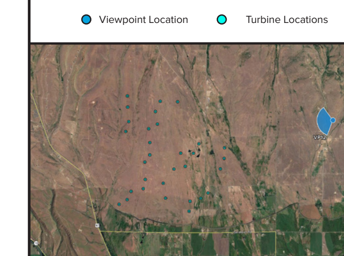
For on-screen display:
Scale bar to be 4 inches (101.6mm wide)
Viewing distance is 19.7 inches (50 cm)

EDF renewable energy

Desert Claim Wind Project

Viewpoint VP12

Robbins Rd



Easting Position (State Plane Washington South):	**1626366.3**
Northing Position (State Plane Washington South):	**657926.5**
Elevation of Photopoint Position (NAD83):	**2562.9**
Height of Camera Above Ground (ft):	**5.4**
Date of Photography:	**29 November 2017 at 10:18 AM**
Orientation of View:	**W**
Horizontal Field of View:	**124°**
Vertical Field of View:	**55°**

Turbine Notes:

Layout 114 :

Siemens 108 - 2.3MW
Rotor Diameter 108 m / 354 ft

Siemens 120 - 2.625MW
Rotor Diameter 120 m / 394 ft

NOTES:

Viewpoint locations have been precision surveyed by:

Surveyor:
Pioneer Surveying and Engineering, Inc.
Goldendale
WA
98620

No part of this photo simulation shall be altered in any way.

Visual assessments should be made from the full size TrueView™ only.

Photo Simulation Created Using
TrueView™ Technology
(Patent No.: US 8,184,906 B2)

Provided by

Truescape®

www.truescape.com

DATE	SHEET
21 December 2017	17

APPENDIX B

Truescape Limited Statement of Methodology

Truescape®

Statement of Methodology of
Truescape Limited

On behalf of

EDF - Renewable Energy

Desert Claim Wind Project

April 2018

Truescape Credentials

Truescape is a global leader in the 3D Photo and Video Simulations industry. With more than 22 years of experience, Truescape has completed thousands of visual simulation projects, including hundreds for renewable energy projects. Truescape's work includes a wide range of different visualization projects from photo-simulations for simple projects to full computer generated 3D video simulations for complex projects. Truescape's client base spans many industry sectors such as solar, wind, transmission and generation across New Zealand, Australia, Canada and the US.

Truescape adopts a team approach for project completion as each type and phase of a project calls for a different mix of specialized skill sets. This expertise spans many disciplines including photography, engineering, architecture, surveying, landscape architecture, 3D computer modelling, evidence- preparation and presenting evidence as expert witnesses. All members of our staff have either formal qualifications or have undergone professional training and have direct experience working in each these specialized areas.

Truescape was active advisor and key member of developing Photo Simulation Standards guidelines for regulatory agencies in the United States (National Park Service - U.S. Department of the Interior "Guide To Evaluating Visual Impact Assessments for Renewable Energy Projects"; BLM-VRM (Bureau of Land Management - Visual Resource Management), as well as New Zealand (NZILA - New Zealand Institute of Landscape Architects - Best Practice Guide Visual Simulations)). Truescape simulations have been produced as evidence in proceedings before courts and siting commissions several around the world. Members of Truescape's staff have presented evidence as expert witnesses in the following proceedings, where our work has been subjected to cross-examination and accepted as evidence:

- 2003 – Meridian Energy, Te Apiti Farm, Council Hearing; Wellington, New Zealand
- 2004 – Meridian Energy, White Hill Farm, Council Hearing; Mossburn, New Zealand
- 2004 – Southern Hydro, Dollar Wind Farm South Australia, Panel Hearing; Melbourne, Australia
- 2005 – Genesis Energy, Awhitu Wind Farm, Environment Court; Auckland, New Zealand
- 2005 – Unison Energy, Hawkes Bay Wind Farm, Environment Court; Hastings, New Zealand
- 2006 – Meridian Energy, Project West Wind, Environment Court; Wellington, New Zealand
- 2006 – Acciona Energy, Wind Farm South Australia, Panel Hearing; Melbourne, Australia

- 2007 – Invenergy, Moresville Wind Energy Park, Permitting Hearing; Stanford, New York, USA
- 2008 – Bluewater Wind, Offshore Wind Farm, Permitting Hearing; Baltimore Maryland, USA
- 2008 – Bluewater Wind, Offshore Wind Farm, Permitting Hearing; New Jersey, USA
- 2008 – BP Alternative Energy – White Pines Project, Permitting; Michigan, USA
- 2008 - Meridian Energy, Project Mill Creek, Council Hearing; Wellington, New Zealand
- 2008 – Meridian Energy, Project Hayes, Environment Court; Dunedin, New Zealand
- 2009 – Meridian Energy; Project Central Wind; Environment Court; Wellington, New Zealand
- 2010 – WestWind Energy, Australia, Permit Application; Melbourne, Australia
- 2010 - Meridian Energy Limited, Project Mill Creek, Environment Court Hearing; Wellington, New Zealand
- 2010 – Pacific Hydro; Australia, Panel Hearing; Melbourne, Australia
- 2011 – AltaLink, Heartland Transmission Project; Alberta Utilities Commission (AUC) Hearing; Edmonton, Alberta, Canada
- 2012/13 - Dominion Virginia Power, Surry-Skiffes Creek & Skiffes Creek-Whealton Transmission Project, State Corporation Commission of Virginia (SCC) Hearing; Richmond, Virginia, USA
- 2014 - New Zealand Transport Agency (NZTA), Wellington Basin Reserve Flyover; Board of Inquiry Hearing; Wellington, New Zealand
- 2017 - Dominion Virginia Power, Norris Bridge 115kV Overhead Line - Transmission Project, State Corporation Commission of Virginia (SCC) Hearing; Richmond, Virginia, USA

Scope of work

EDF - Renewable Energy engaged Truescape in November 2017 to provide:

Seven (7) survey-controlled TrueView™ Photo Simulations from six (6) pre-determined viewpoint locations, depicting two (2) different layout options (Vestas and Siemens turbines) with respective turbine types from each viewpoint.

The simulations are a tool to assist with the visual assessment of the proposed Desert Claim Wind project.

Validation of the Truescape methodology

We have attached below some post construction analysis of the ‘Project West Wind’ wind farm that compared a simulation built using the construction layout plan against the completed project. This comparison of the photographs demonstrates the accuracy of the TrueView™ simulations.

In particular, it can be seen that the size and placement of the turbines in this simulation is identical to the wind farm that was constructed. It should be noted that the turbines in the simulation seem more obvious than the actual turbines in the photograph due to the atmospheric conditions experienced on the day the photograph was taken.

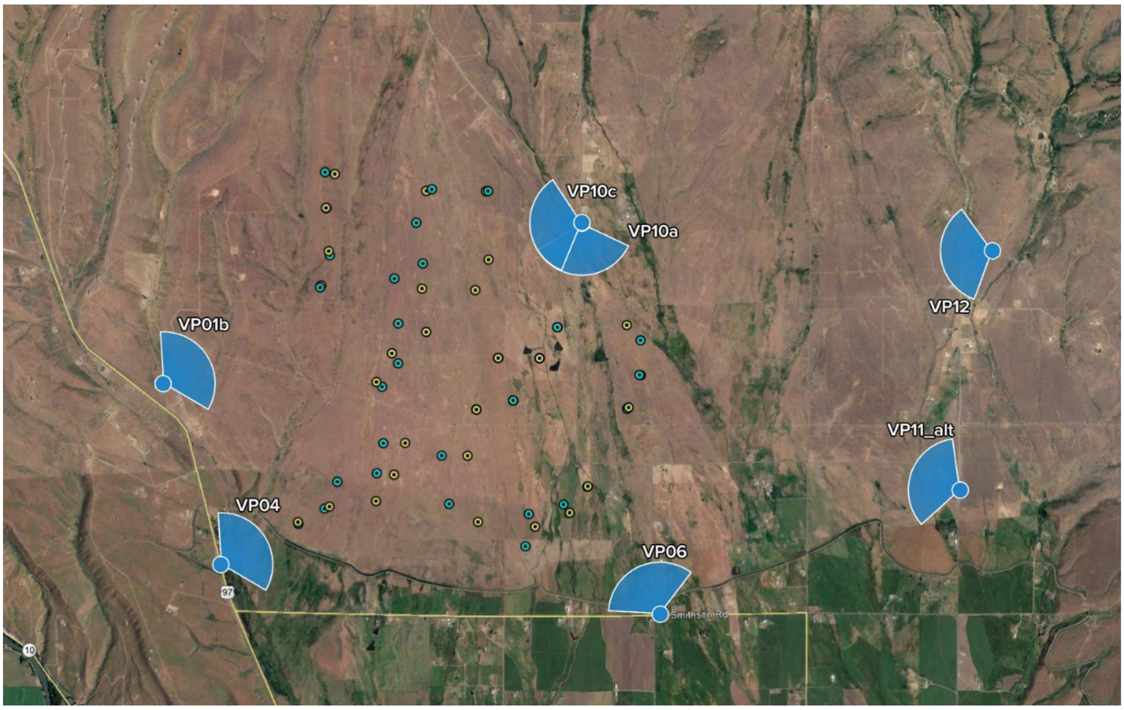
The simulation and photograph were produced 2 years and 7 days apart and both are taken at the same time of day so as to produce the same lighting and shadow conditions.

SIMULATION OF PROJECT WEST WIND PRE CONSTRUCTION (February 2008)

PHOTOGRAPH OF PROJECT WEST WIND POST CONSTRUCTION (February 2010)

Viewpoint locations

Location map depicting viewpoints which TrueView™ Photo Simulations for the Desert Claim Wind Project have been created from.



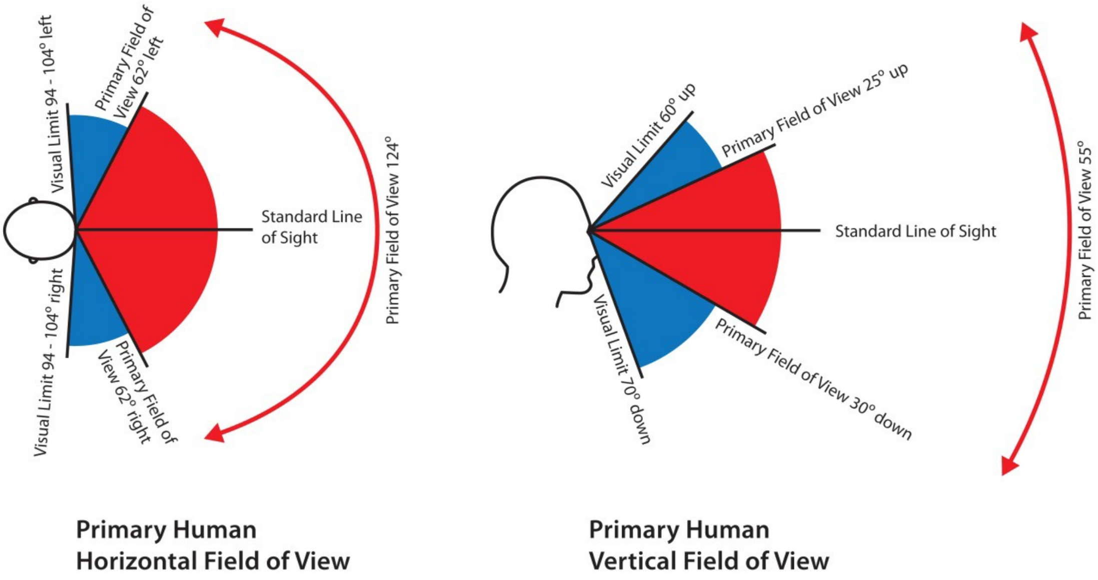
- Viewpoint 01b – Cricklewood Lane
- Viewpoint 04 – Highway 97
- Viewpoint 06 – Smithson Road
- Viewpoint 10a & 10c – Reecer Creek
- Viewpoint 11_alt – Robbins Road
- Viewpoint 12 – Robbins Road

Blue cones represent viewpoint location and orientation of view.
Yellow dots represent location of turbines of the proposed Vestas layout option.
Blue dots represent location of turbines of the proposed Siemens layout option.

TrueView™ photo simulations

A TrueView™ Photo Simulation is a high resolution, true scale format photo simulation that represents the **Primary Human Field of View** that would be seen if standing 19.7 inches back from actual photo point position at the same time of day and reflecting the same climatic conditions as those experienced on the day the photograph was taken.

Primary Human Field of View



Reference: Panero J. and Zelnick M. (1979)
Human dimension and interior space: A source book of design reference standards, London: The Architectural Press Ltd

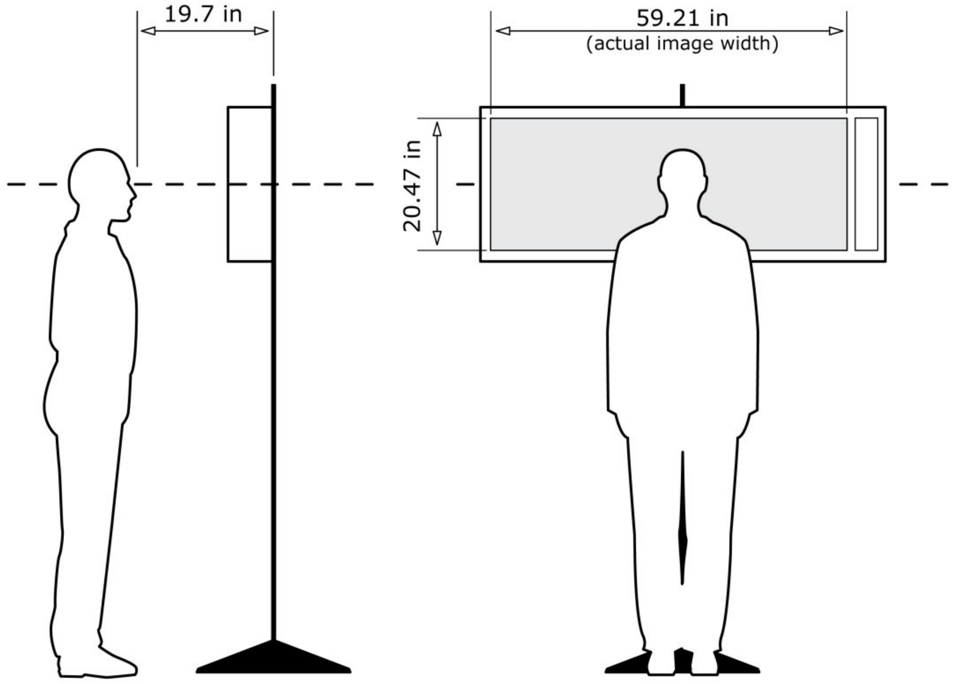
TrueView™ photo simulations

Correct Viewing of TrueView™ Photo Simulations

The TrueView™ simulations when viewed at the correct height and from a distance of 19.7 inches from the center of the image completely fill your field of view with the same view you would see at the photo point position.

The image should be displayed level at such a height to allow the viewer line of sight to be directly at the center of the image.

The viewer should be looking forward at the center of the image at all times to ensure correct viewing as shown below.



The TrueView™ has been developed to be viewed on a specifically sized printed sheet (66.8 inches by 23.9 inches paper size; 59.21 inches by 20.47 inches actual image size) standing at a distance of 19.7 inches from the image.

Although reduced-size photo booklets are often used as a reference when comparing existing views to simulated project views, these smaller pictures are not intended to represent the image a person standing at the viewpoint would see. To represent that field of view, accurate visual assessments should always be made from the full-sized printed version of the TrueView™ rather than reduced size booklets or digital devices.

Viewing on digital devices

When viewing a TrueView™ on digital devices please confirm that the scale bar located in the bottom-right corner of the TrueView™ is scaled to four inches wide and then the image viewed from a distance of 19.7 inches. This ensures that the portion of the TrueView™ visible on the screen is a true to scale representation.

Important: If the scale bar is not adjusted to four inches on your screen, and if the image is not viewed at a distance of 19.7 inches then the TrueView™ image displayed will either overstate or understate how the project will look from the photo point position.

The role of lenses

Whenever photo simulations are being assessed, submitters often question the accuracy of those simulations and specifically the lens type used to create them. The sections below provide a concise overview of our methodology and the reasons behind the development of the TrueView™.

Camera lenses of different focal length create images of different fields of view. None of these fields of view are the same as the human field of view. A camera lens does not encompass the same horizontal and vertical “degree of arc” that is captured by human binocular vision. This is why a picture taken with a “non-human” lens does not represent what we actually see.

Look at the four photos below. The view captured with a 28 mm lens looks further away than the view from the same spot taken with a 50 mm lens. Standing at the same location, and using a 100 mm lens, features in the picture looking closer still, and with a 300 mm lens, features that were far away now look much closer, and larger.

28 mm image

50 mm image

100 mm image

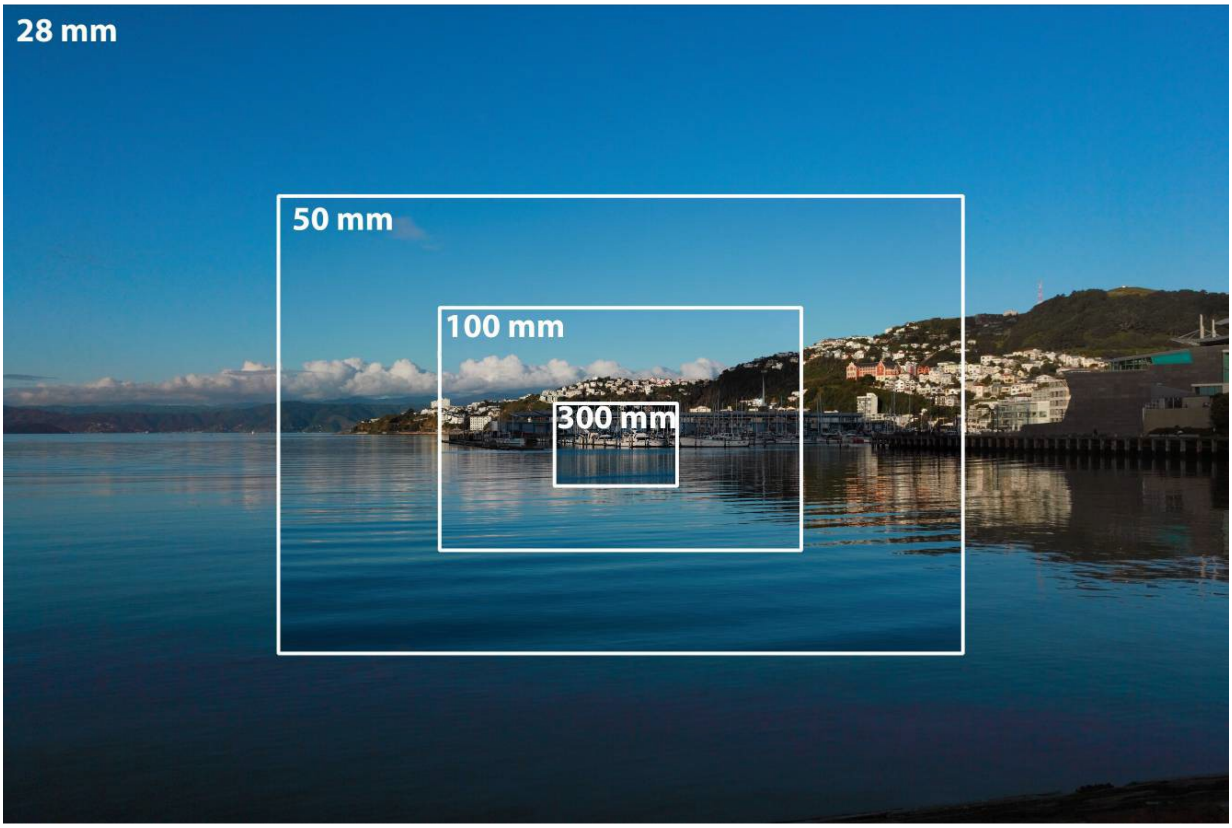
300 mm image

In reality, there is just one true view of what a person sees from any specified location. A photograph taken with any of these lenses can be used to produce a picture in which the objects look the same distance away as they would be seen with the human eye, but a different sized picture printout would be required, depending upon the lens used to take the photograph. For example, the objects photographed would appear the same distance away in a picture of the 28 mm lens image when it is displayed roughly twice the size of a picture of the 50 mm lens image. However, the 28 mm lens would have a larger visual field, closer to the horizontal and vertical field seen by the human eye.

The role of lenses …

To understand how illusions are created by lens size, one must understand depth of field, and how “depth of field” and “field of view” are related. As you increase the millimeter specification (or focal length) of a lens, the less field of view it incorporates – some of the view to the left and right, and above and below, is cropped out. The view is not only less wide, it is also less deep.

As you decrease your field of view you are decreasing the amount of visible foreground in the image, but leaving the vanishing point or distant center unaltered. It is this truncation of depth of field, which causes far objects in images to appear nearer to other physically closer objects in the scene. The image below shows the combined view when comparing 28 mm, 50 mm, 100 mm, and 300 mm lenses.



For example, the field of view of a 50 mm lens is contained *within* the field of view of a 28 mm lens because a 28 mm lens has a greater field of view than a 50 mm lens. The 28 mm image has a correspondingly greater depth of field because it incorporates more foreground image.

Photographs only represent a part of our primary field of vision. However photographs taken using a 28 mm lens represent a far greater portion of our primary field of vision.

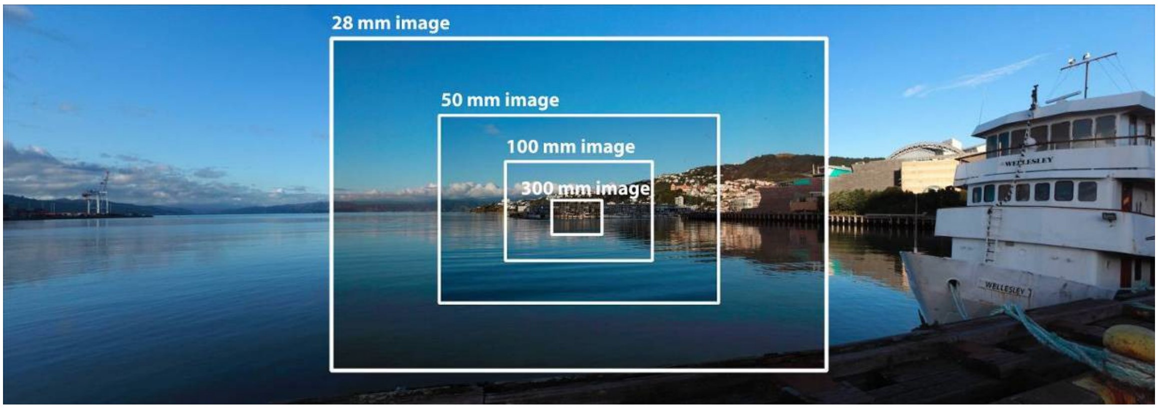
The role of lenses …

No camera lens duplicates the primary field of human vision. In order to be able to match exactly the field of view of the **vertical** extent of primary vision, we would need to use a camera lens of 25.933mm. (Thus, a 28 mm lens is a much better starting point than a 50 mm lens)

In order to match exactly the field of view of the **horizontal** extent of primary vision, we would need to use a camera lens of 9.571 mm. However it is not practical to use a lens with a focal length of 9.571 mm, as it becomes too difficult to compensate for the effects of distortion. A TrueView™ image solves this problem.

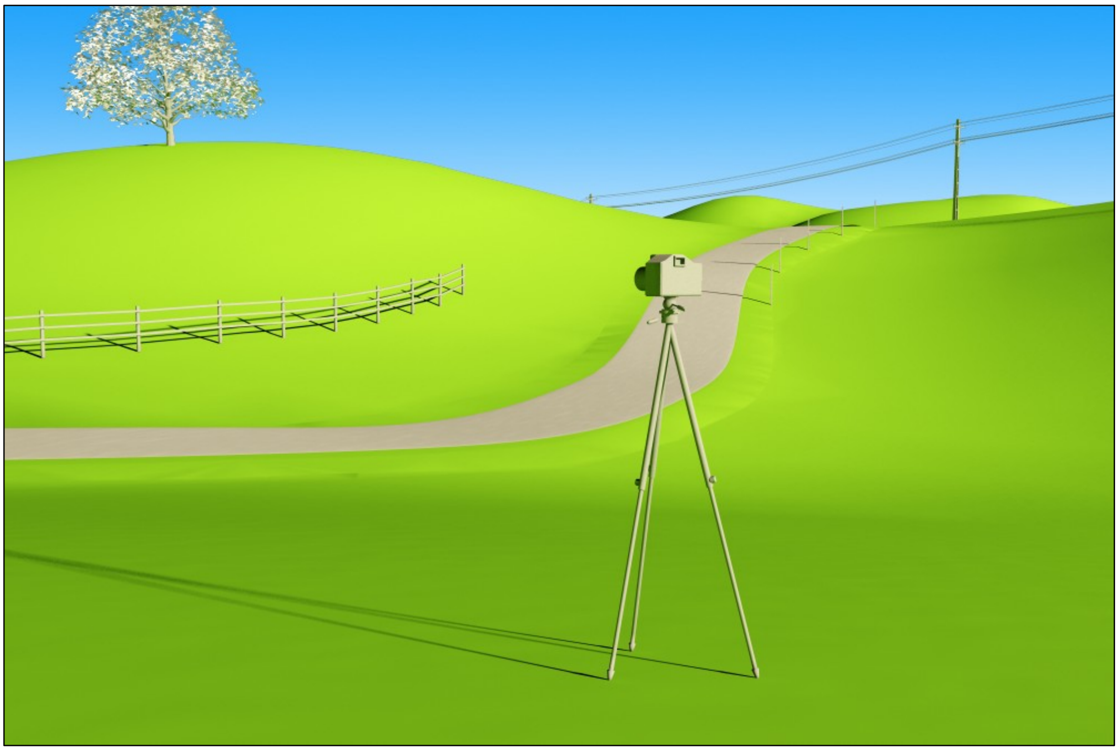
Since it is not possible to take a photograph with a 9.571 mm lens, and print out that image on a flat plane, the horizontal length of the image itself must be made up of multiple images.

Truescape has chosen to create an image based upon a number of 28 mm images. We have selected this lens size for best accuracy and optimum efficiency in production. A similar method could be use with a series of 50 mm, or 100 mm images, and it would produce an identical simulated image. However, the complexity of production and the number of images required would be far greater. Again, under this simulation method, the resulting image is the same regardless of the lens used to take the photographs. As explained above, in order for the image to represent objects at the same distance and size from the observer as perceived by the human eye, the simulation needs to be displayed at an appropriate size and viewed from the appropriate distance.



Methodology

The site visit

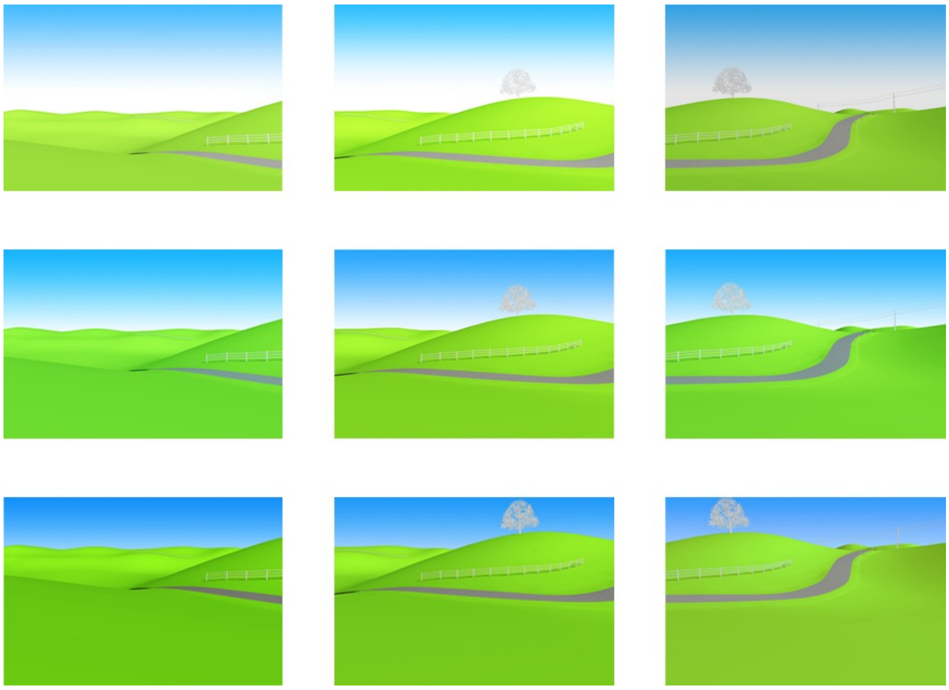


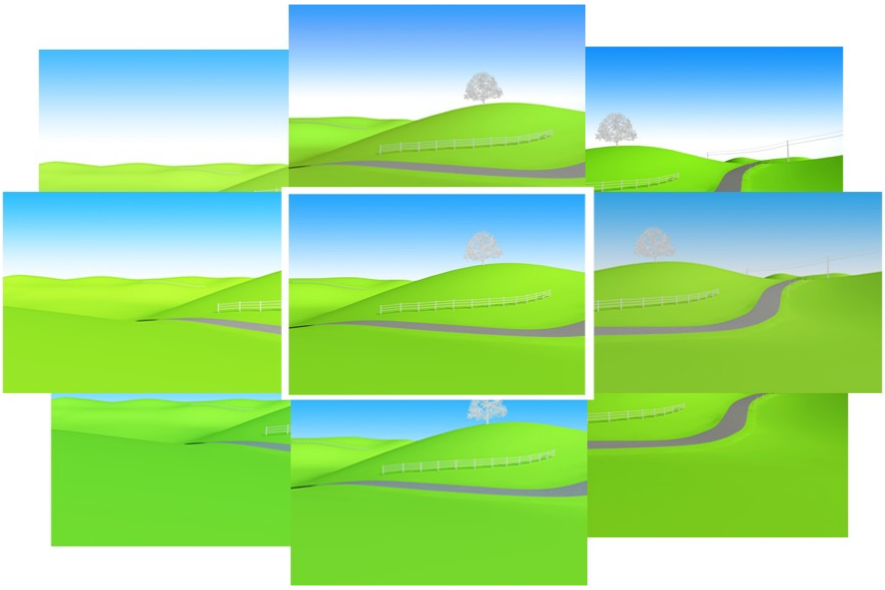
The site visit is undertaken to take the necessary photographs and ground mark the photo point position and identify additional reference points to enable the surveyor to survey fix the exact location of the camera.

A digital SLR 1:1 22 mega pixel camera is used to take the photography. This camera produces photographs at a resolution and clarity as good as current technology will allow when generating simulations.

Methodology

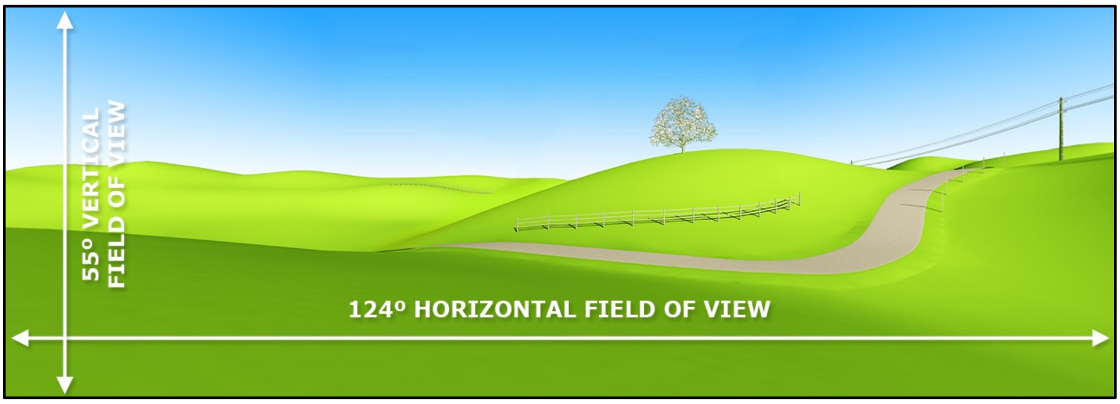
Creating the Primary Human Field of View image





Methodology

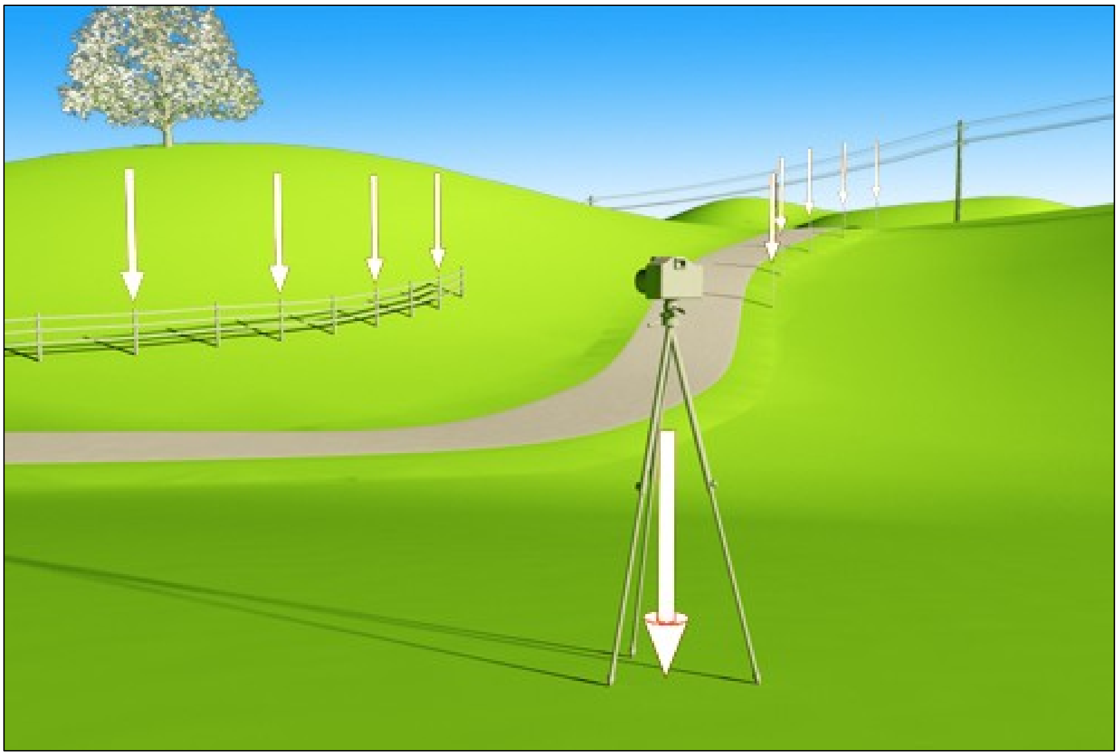
The final colour adjusted TrueView™ photography



Using the middle photographs as the benchmark, each of the adjoining photographs are color adjusted to ensure consistency throughout the image. The TrueView™ photograph is now complete.

Methodology

Capturing the surveyed reference points

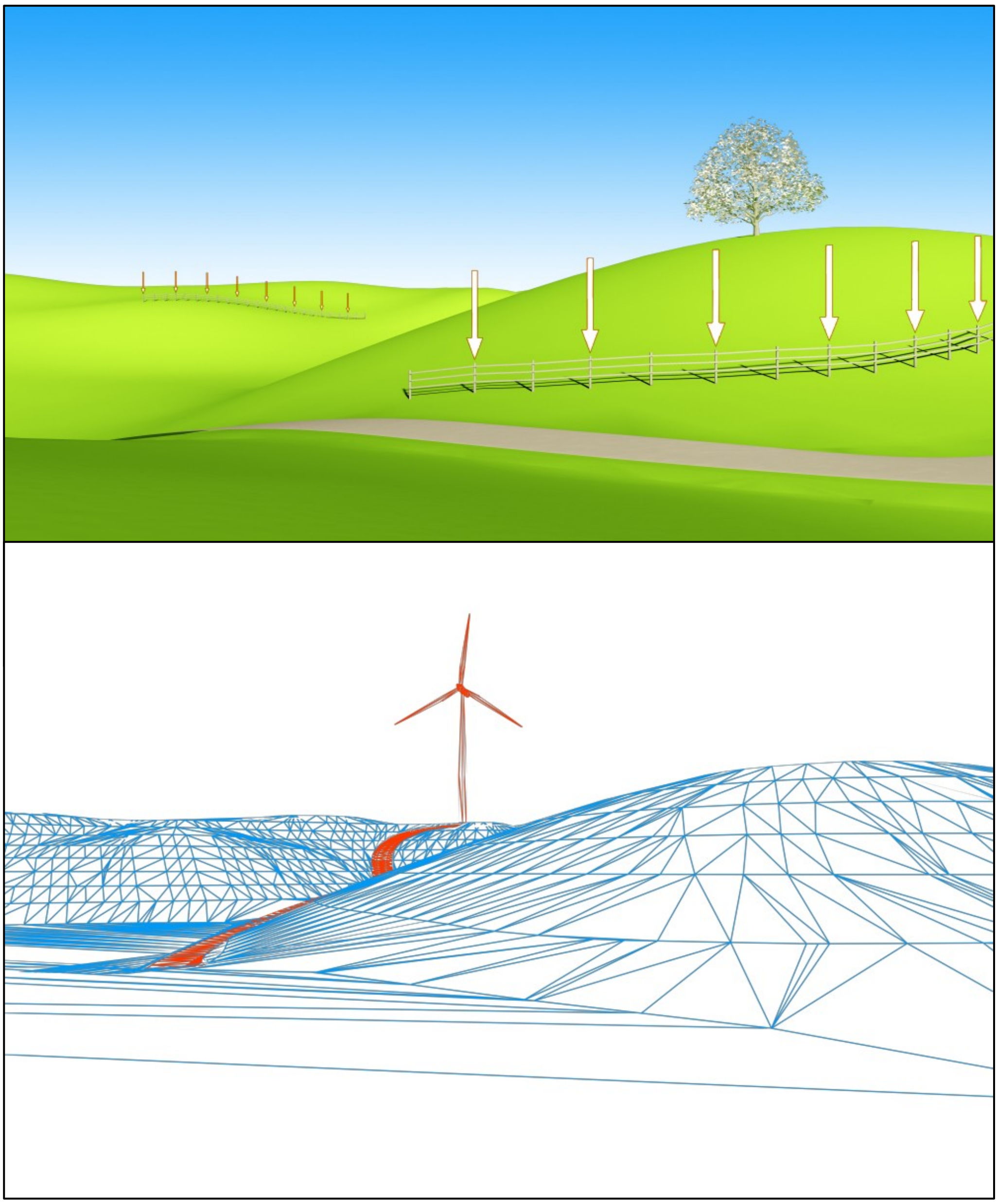


To accurately create a TrueView™ photo simulation the exact position of the camera is survey fixed by a surveyor.

Additional reference points are identified during the site visit so that the 3D model can be accurately placed into the photograph. These reference points include things like fences, vegetation, houses and roads. The surveyor is directed to each of these points.

Methodology

Aligning the surveyed reference points

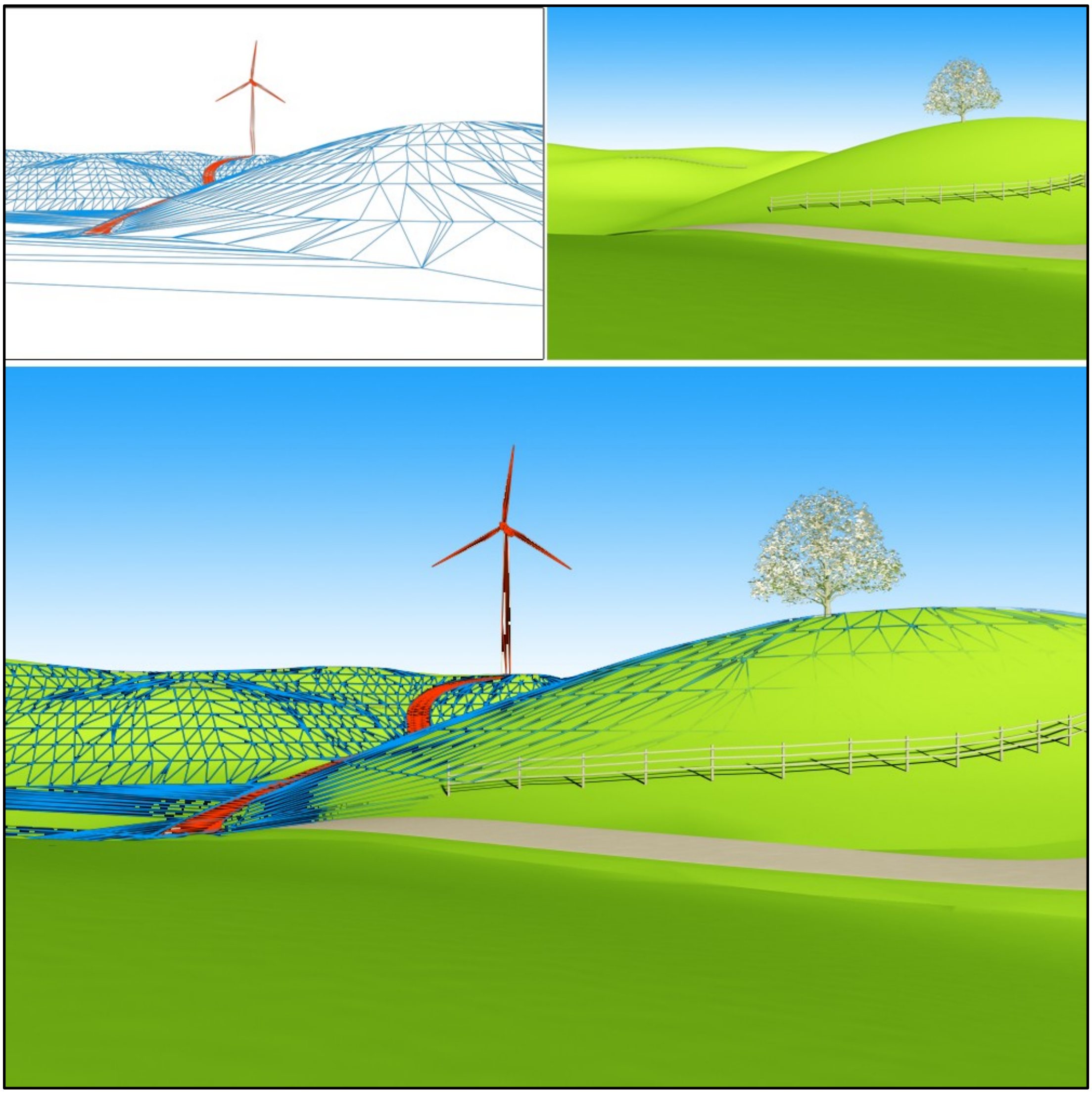


The next step is to construct the 3D computer model. Using Autodesk® 3ds Max® 3D computer simulation software the survey-fixed photo and reference points are imported into the 3D model. A "computer camera" is created to simulate the camera that captured the original photographs, including matching the focal length. The simulated "computer camera" is then positioned at the same survey coordinates as the physical viewpoint positions.

The photographs are then incorporated into the computer model. This is done by correctly aligning the "computer camera", matching the surveyed reference points to the reference objects, and to the terrain if required.

Methodology

Building the proposed project in 3D



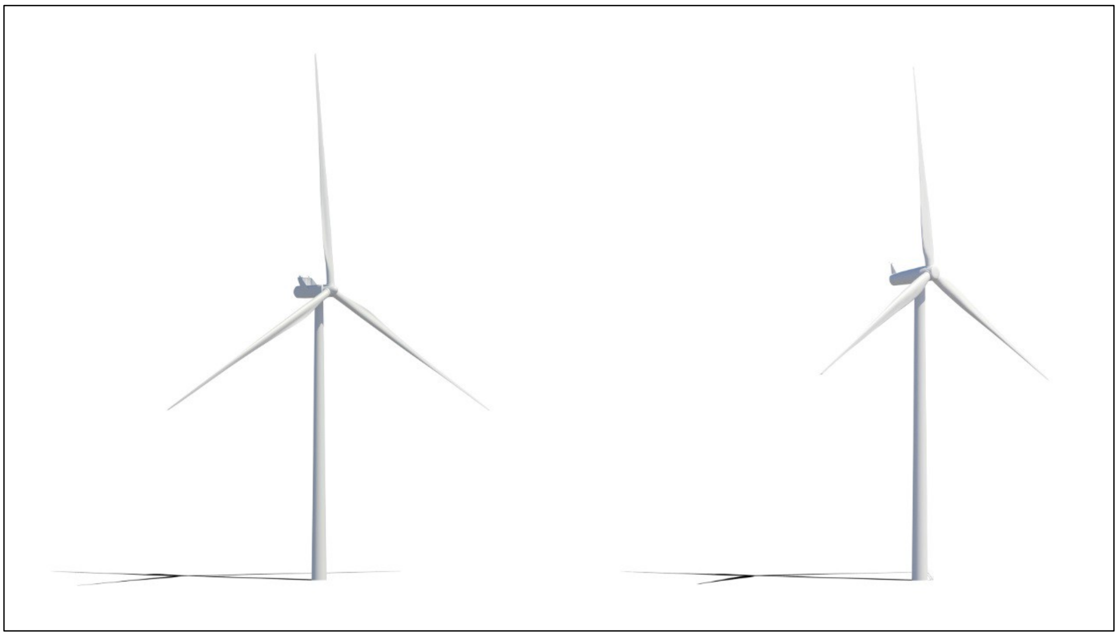
The 3D terrain model of the site has been generated using the land contour data. The proposed wind turbines have been modelled in 3D and are now imported and positioned accurately into the scene.

The simulation software allows the sun to be simulated at the precise time the original photography was captured. This ensures the lighting of the turbines as well as the shadows they cast are an accurate depiction of how the Project would appear in the photograph at the same time of day and reflecting the same climatic conditions as those experienced at the time the photograph was taken.

METHODOLOGY

Building the proposed project in 3D

The proposed project is then modelled in 3D in accordance with all dimensions, site layouts, colors and textures.



Examples of the turbine 3D-models:
Vestas V136-3.6MW (on left) and Siemens SWT2.625MW-120 (on right)

Methodology

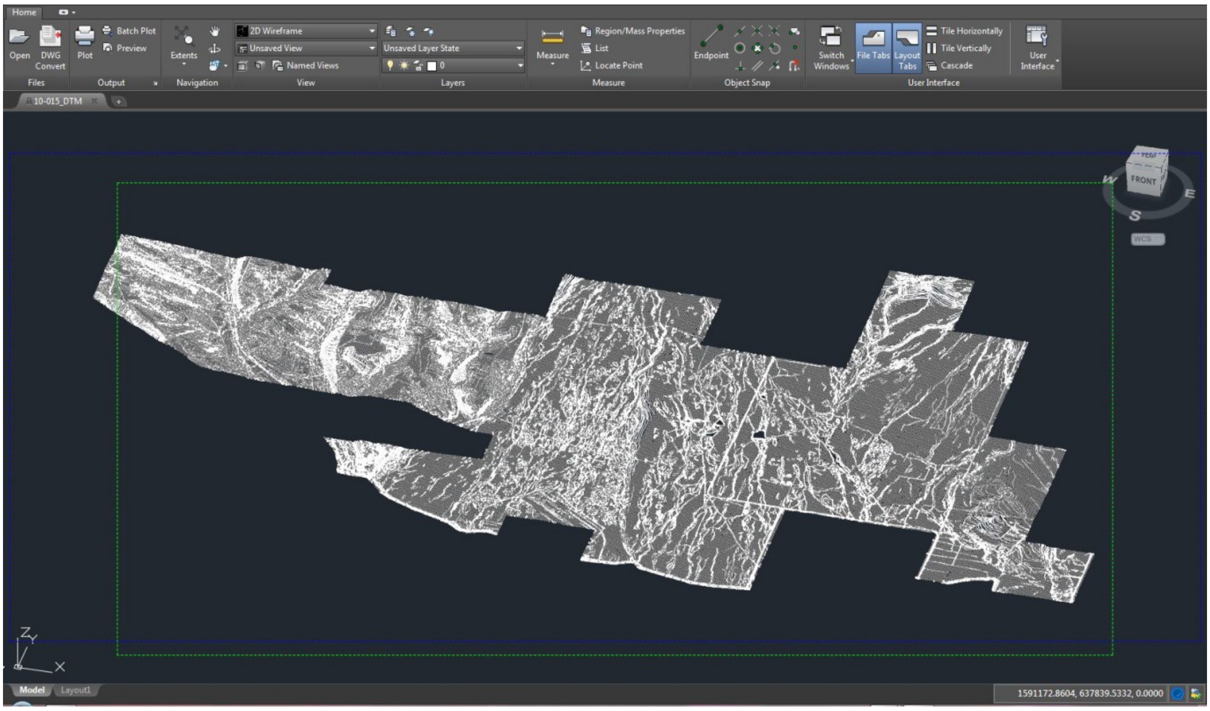
The final TrueView™ simulation

In order to correctly place existing objects that are in front of the 3D model of the development these foreground objects are overlaid, from the original photograph, onto the computer generated image using photo editing software.

As already outlined earlier in this document, our extensive experience in researching how to accurately simulate the "Primary Human Field of View" has determined that the lens type is irrelevant when generating such simulations. The key factors are the correct aligning of the raw photographs in 3D, the size the simulations are output at, and the viewing distance.

The full size TrueView™ simulations are printed at a size that represents the "Primary Human Field of View", being 124º horizontal field of view and 55º vertical field of view when standing 19.7 inches from the center of the image.

Model input data



High resolution Digital Terrain Model (DTM) data of the project area, derived from aerial LiDAR (Light Detection and Ranging) laser scans, to allow accurate vertical placement of the proposed wind turbines within the 3d-space.

DTM data provided by EDF - Renewable Energy.

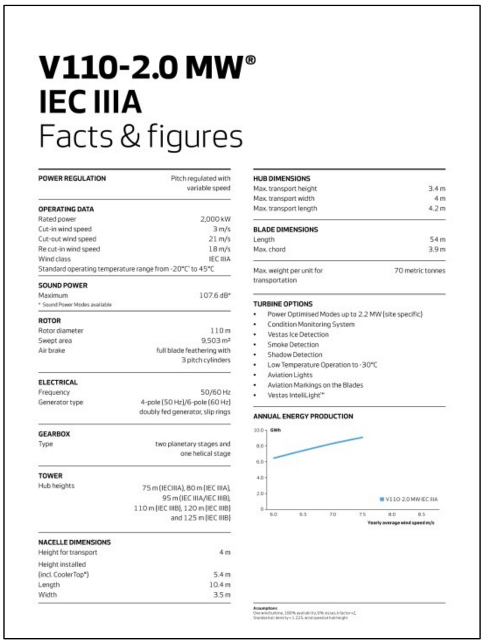
Model input data

X	Y	Type	TID
1603388.4	659447.02	Vestas_3600_136_3A_2017_Mk3DHH82	A-2
1610576.77	648414.67	Vestas_3600_136_3A_2017_Mk3DHH82	B-18
1606849.16	660020.82	Vestas_3600_136_3A_2017_Mk3DHH82	A-5
1608906.06	660001.42	Vestas_3600_136_3A_2017_Mk3DHH82	A-7
1603195.95	656785.37	Vestas_3600_136_3A_2017_Mk3DHH82	A-4
1608581.62	648582.75	Vestas_3600_136_3A_2017_Mk3DHH82	B-12
1608986.67	657669.01	Vestas_3600_136_3A_2017_Mk3DHH82	A-8
1603397.5	649122.43	Vestas_3600_136_3A_2017_Mk3DHH82	B-7
1608226.86	650890.04	Vestas_3600_136_3A_2017_Mk3DHH82	B-11
1603702.06	660602.43	Vestas_3600_136_3A_2017_Mk3DHH82	A-1
1606054.64	651335.89	Vestas_3600_136_3A_2017_Mk3DHH82	B-4
1608525.01	656617.58	Vestas_3600_136_3A_2017_Mk3DHH82	A-9
1606812.84	655179.9	Vestas_3600_136_3A_2017_Mk3DHH82	B-1
1611781.98	648899.43	Vestas_3600_136_3A_2017_Mk3DHH82	B-17
1602290.64	648577.74	Vestas_3600_136_3A_2017_Mk3DHH82	B-8
1605026.24	649311.54	Vestas_3600_136_3A_2017_Mk3DHH82	B-6
1605616.24	654444.76	Vestas_3600_136_3A_2017_Mk3DHH82	B-2
1603465.36	657967.17	Vestas_3600_136_3A_2017_Mk3DHH82	A-3
1605660.41	650231.51	Vestas_3600_136_3A_2017_Mk3DHH82	B-5
1614257.15	653675.84	Vestas_3600_136_3A_2017_Mk3DHH82	C-2
1613834.88	652558.84	Vestas_3600_136_3A_2017_Mk3DHH82	C-3
1605071.96	653452.49	Vestas_3600_136_3A_2017_Mk3DHH82	B-3
1606678.77	656673.58	Vestas_3600_136_3A_2017_Mk3DHH82	A-6
1613769.22	655407.98	Vestas_3600_136_3A_2017_Mk3DHH82	C-1
1612415.34	649819.33	Vestas_3600_136_3A_2017_Mk3DHH82	B-16
1610741.72	654267.92	Vestas_2000_110_3A_2016_Mk10C	B-14
1611363.62	655337.6	Vestas_2000_110_3A_2016_Mk10C	B-13
1609307.76	654279.03	Vestas_2000_110_3A_2016_Mk10C	B-9
1609821.88	652805.13	Vestas_2000_110_3A_2016_Mk10C	B-15
1608541.89	652494.01	Vestas_2000_110_3A_2016_Mk10C	B-10

X	Y	Type	TID
1603395.01	659430.85	Siemens_2625_120_2S_2017_HH85m	A-2
1610354.53	648854.71	Siemens_2625_120_2S_2017_HH85m	B-18
1606497.58	658936.06	Siemens_2625_120_2S_2017_HH85m	A-6
1607040.72	660077.43	Siemens_2625_120_2S_2017_HH85m	A-5
1603157.31	656720.1	Siemens_2625_120_2S_2017_HH85m	A-4
1607579.37	649212.57	Siemens_2625_120_2S_2017_HH85m	B-12
1608981.72	660010.26	Siemens_2625_120_2S_2017_HH85m	A-9
1603225.07	649051.1	Siemens_2625_120_2S_2017_HH85m	B-7
1607327.93	650895	Siemens_2625_120_2S_2017_HH85m	B-11
1606713.63	657536.4	Siemens_2625_120_2S_2017_HH85m	A-7
1608541.89	652494.01	Siemens_2625_120_2S_2017_HH85m	B-10
1605295.71	651327.55	Siemens_2625_120_2S_2017_HH85m	B-4
1603370.48	660661.71	Siemens_2625_120_2S_2017_HH85m	A-1
1605843.41	655475.32	Siemens_2625_120_2S_2017_HH85m	B-1
1611564.09	649188.33	Siemens_2625_120_2S_2017_HH85m	B-17
1602304.43	648515.59	Siemens_2625_120_2S_2017_HH85m	B-8
1603681.4	649987.29	Siemens_2625_120_2S_2017_HH85m	B-6
1605830.01	654096.58	Siemens_2625_120_2S_2017_HH85m	B-2
1603503.18	657823.96	Siemens_2625_120_2S_2017_HH85m	A-3
1605061.9	650282.65	Siemens_2625_120_2S_2017_HH85m	B-5
1614209.68	653683.34	Siemens_2625_120_2S_2017_HH85m	C-2
1613779.68	652513.66	Siemens_2625_120_2S_2017_HH85m	C-3
1605266.3	653288	Siemens_2625_120_2S_2017_HH85m	B-3
1605725.47	657022.57	Siemens_2625_120_2S_2017_HH85m	A-8
1614247.76	654880.75	Siemens_2625_120_2S_2017_HH85m	C-1
1612395.73	649802.53	Siemens_2625_120_2S_2017_HH85m	B-16
1610236.34	647731.32	Siemens_2625_120_2S_2017_HH85m	B-19
1610741.72	654267.92	Siemens_2300_108_2B_2015	B-14
1611363.62	655337.6	Siemens_2300_108_2B_2015	B-13
1609307.76	654279.03	Siemens_2300_108_2B_2015	B-9
1609821.88	652805.13	Siemens_2300_108_2B_2015	B-15

Coordinate staking tables for both options of the proposed Vestas as well as Siemens turbine layouts, provided by EDF - Renewable Energy.

Model input data



V110-2.0 MW®
IEC IIIA
Facts & figures

POWER REGULATION Pitch regulated with variable speed

OPERATING DATA

Rated power	2,000 kW
Cut-in wind speed	3 m/s
Cut-out wind speed	21 m/s
Re cut-in wind speed	18 m/s
Wind class	IEC IIIA

Standard operating temperature range from -20°C* to 45°C

SOUND POWER

Maximum	107.6 dB*

* Sound Power Modes available

ROTOR

Rotor diameter	110 m
Swept area	9,503 m²
Air brake	full blade feathering with 3 pitch cylinders

ELECTRICAL

Frequency	50/60 Hz
Generator type	4-pole (50 Hz)/6-pole (60 Hz) doubly fed generator, slip rings

GEARBOX

Type	two planetary stages and one helical stage

TOWER

Hub heights	75 m (IECIIIA), 80 m (IEC IIIA), 95 m (IEC IIIA/IEC IIIB), 110 m (IEC IIIB), 120 m (IEC IIIB) and 125 m (IEC IIIB)

NACELLE DIMENSIONS

Height for transport	4 m
Height installed (incl. CoolerTop®)	5.4 m
Length	10.4 m
Width	3.5 m

HUB DIMENSIONS

Max. transport height	3.4 m
Max. transport width	4 m
Max. transport length	4.2 m

BLADE DIMENSIONS

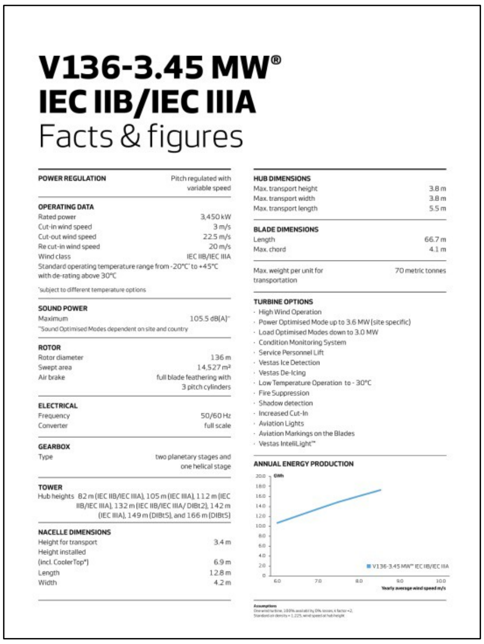
Length	54 m
Max. chord	3.9 m

Max. weight per unit for transportation 70 metric tonnes

TURBINE OPTIONS

- Power Optimised Modes up to 2.2 MW (site specific)
- Condition Monitoring System
- Vestas Ice Detection
- Smoke Detection
- Shadow Detection
- Low Temperature Operation to -30°C
- Aviation Lights
- Aviation Markings on the Blades
- Vestas InteliLight™

ANNUAL ENERGY PRODUCTION



V136-3.45 MW®
IEC IIB/IEC IIIA
Facts & figures

POWER REGULATION Pitch regulated with variable speed

OPERATING DATA

Rated power	3,450 kW
Cut-in wind speed	3 m/s
Cut-out wind speed	22.5 m/s
Re cut-in wind speed	20 m/s
Wind class	IEC IIB/IEC IIIA

Standard operating temperature range from -20°C* to +45°C with de-rating above 30°C

*subject to different temperature options

SOUND POWER

Maximum	105.5 dB(A)**

**Sound Optimised Modes dependent on site and country

ROTOR

Rotor diameter	136 m
Swept area	14,527 m²
Air brake	full blade feathering with 3 pitch cylinders

ELECTRICAL

Frequency	50/60 Hz
Converter	full scale

GEARBOX

Type	two planetary stages and one helical stage

TOWER

Hub heights 82 m (IEC IIB/IEC IIIA), 105 m (IEC IIIA), 112 m (IEC IIB/IEC IIIA), 132 m (IEC IIB/IEC IIIA/ DIBt2), 142 m (IEC IIIA), 149 m (DIBtS), and 166 m (DIBtS)

NACELLE DIMENSIONS

Height for transport	3.4 m
Height installed (incl. CoolerTop®)	6.9 m
Length	12.8 m
Width	4.2 m

HUB DIMENSIONS

Max. transport height	3.8 m
Max. transport width	3.8 m
Max. transport length	5.5 m

BLADE DIMENSIONS

Length	66.7 m
Max. chord	4.1 m

Max. weight per unit for transportation 70 metric tonnes

TURBINE OPTIONS

- High Wind Operation
- Power Optimised Mode up to 3.6 MW (site specific)
- Load Optimised Modes down to 3.0 MW
- Condition Monitoring System
- Service Personnel Lift
- Vestas Ice Detection
- Vestas De-Icing
- Low Temperature Operation to - 30°C
- Fire Suppression
- Shadow detection
- Increased Cut-In
- Aviation Lights
- Aviation Markings on the Blades
- Vestas InteliLight™

ANNUAL ENERGY PRODUCTION

SIEMENS
Ingenuity for life

Wind Turbine SWT-2.3-108
Technical specifications

Product Name: SWT-2.3-108
Application: Onshore
Technology: Geared drive
Wind Class: II B

Rotor

Type	3-bladed, horizontal axis
Position	Upwind
Diameter	108 m
Swept area	9,150 m²
Speed range	6 - 16 rpm
Power regulation	Pitch regulation with variable speed
Rotor tilt	6 degrees

Blade

Type	Self-supporting
Blade Length	53 m
Root chord	3.4 m
Aerodynamic profile	NACA63.xxx, FFAxxx, SWPxxx
Material	GRE
Surface gloss	Semi-gloss, < 30 / ISO2813
Surface color	Light grey, RAL 7035

Aerodynamic Brake

Type	Full-span pitching
Activation	Active, hydraulic

Load-Supporting Parts

Hub	Nodular cast iron
Main bearing	Spherical roller bearing
Main shaft	Alloy steel
Nacelle bed plate	Steel

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SIEMENS

Wind Turbine SWT-2.5-120 / SWT-2.625-120
Technical specifications

Product Name: SWT-2.5-120 / SWT-2.625-120
Application: Onshore
Technology: Geared drive
Wind Class: IIB / IIS

Operating data

Rated power	2.5 MW (SWT-2.5-120) 2.625 MW (SWT-2.625-120)
Cut-in wind speed	3 m/s
Cut-out wind speed	22 m/s
Nominal power at	11-12 m/s
Operating (range) rotational speed	5.5-13.1 rpm (SWT-2.5-120) 5.5-13.5 rpm (SWT-2.625-120)
Wind class	IEC IIB / IIS

Power regulation

Power regulation	Pitch regulation with variable speed

Sound power

Sound power	Alternative noise modes available dependent on site and country

Rotor

Diameter	120 m
Swept area	11,310 m²
Blade length	59 m
Max. chord	3.8 m

Aerodynamic brake

Type	Full span pitching
Activation	Active, hydraulic

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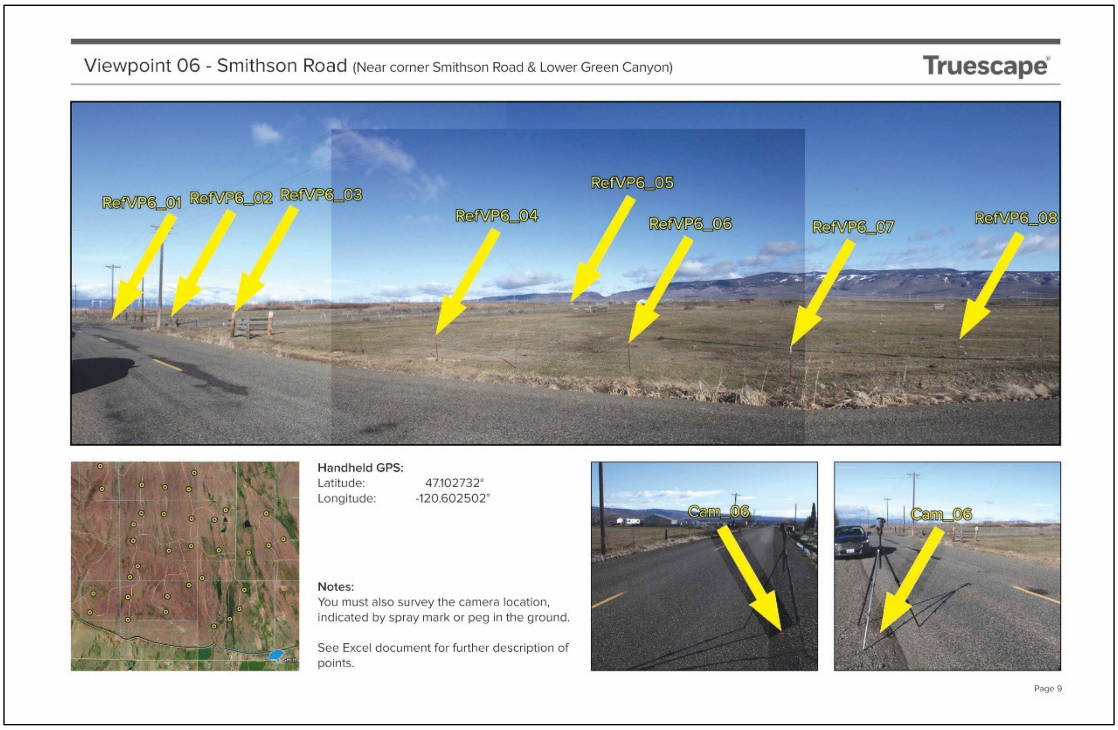
Turbine Manufacturer’s specifications and data sheets for both, Vestas as well as Siemens wind turbines.

Survey Control

The images below represent alignment of the digital terrain (depicted by red overlay) and 3D model to the real world photography. Camera locations including individual reference points where requested, then precision surveyed by: Pioneer Surveying and Engineering, Inc., Goldendale, WA.



Using "Viewpoint 06 - Smithson Road" as an example, the images above show reference points depicted by colored lines which have been requested (yellow arrows), survey fixed (bottom of green cylinders) and were used to accurately position the 3D model of the proposed Desert Claim Wind Project into the photograph.

An image of the final TrueView™ Photo Simulation for this Viewpoint is depicted below.

GOLDER

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