

Appendix U  
Visual Impact Assessment

# Visual Impact Assessment

## Icebreaker Wind Farm

City of Cleveland, Ohio

Prepared for:



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## **1.0 Introduction**

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) was retained by the Lake Erie Energy Development Corporation (LEEDCo) (“the Applicant”) to prepare a Visual Impact Assessment (VIA) for the proposed Icebreaker Wind Farm (“Icebreaker”, “Facility” or “Project”) located 8 to 10 miles north of Cleveland, Ohio in Lake Erie. The purpose of this VIA is to:

- Describe the appearance of the visible components of the proposed Project.
- Define the visual character of the Project study area.
- Inventory and evaluate existing visual resources and viewer groups.
- Evaluate potential Project visibility within the study area.
- Identify key views for visual assessment.
- Assess the visual impacts associated with the proposed action.

This VIA was prepared with oversight provided by a registered landscape architect licensed in the State of Ohio<sup>1</sup> and experienced in the preparation of visual impact assessments. It is also consistent with the policies, procedures, and guidelines contained in established visual impact assessment methodologies (see Literature Cited/References section).

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<sup>1</sup>Mr. Douglas Brackett: registered by the State Education Departments to practice Landscape Architecture in the States of New York, Pennsylvania, and Ohio.

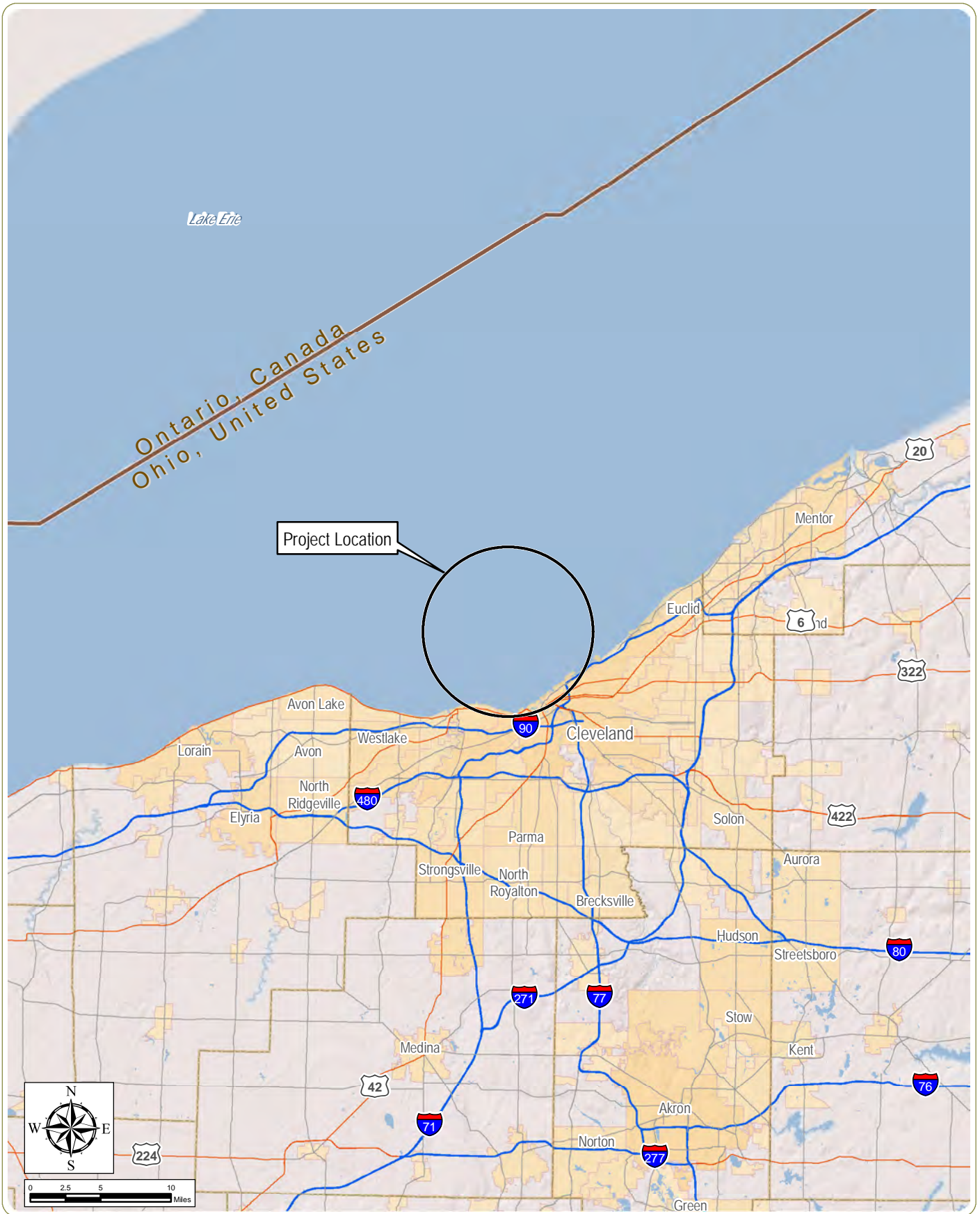
## **2.0 Project Description**

### **2.1 Project Site**

The proposed turbines for the Icebreaker Wind Farm are located between 8 and 10 miles off-shore of the City of Cleveland Ohio, in Lake Erie (Figure 1). The proposed turbine array is a straight line, oriented in a southeast/northwest direction, with each individual turbine site separated by approximately 6 rotor diameters or 2,480 feet (Figure 2). Seven potential turbine sites have been identified, but only six turbines will be installed, presumably excluding the most distant site (identified in figures as the Alternate Turbine site) The proposed turbine sites are located a minimum of 2.3 miles from the nearest navigation channel, and include no existing man-made structures, buoys or navigational aids. The Project also includes a buried cable located within the lake bed between each turbine (inter-array cable) and between the southernmost turbine and the shoreline in the City of Cleveland (export cable).

The Applicant has entered a 50-year submerged land lease (SLL) agreement with the State of Ohio, which commenced on February 1, 2014. The SLL covers the turbine sites, cable right-of-way (ROW), and a substation site adjacent to the Cleveland Public Power (CPP) Lake Road Substation. As per the SLL, the area to be used for construction/operation of the Facility includes 0.4 acre for the substation and 4.2 acres for the six wind turbines. The cable ROW leased area consists of a 100-foot-wide strip along the approximately 12.1 mile cable route (inter-array cables and export cable).

The Project site falls within the local jurisdiction of the Port of Cleveland. The Board of Directors of the Port has considered and approved a resolution concluding that the land requested by the Applicant in its SLL application is in accordance with the permissible land uses identified in the Port's waterfront plan.



## Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

### Figure 1: Regional Project Location

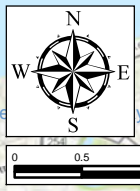
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Notes: 1. Basemap: ESRI StreetMap North America, 2008.

2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



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**Icebreaker Wind**  
 Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 2: Proposed Project Layout  
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Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" Map Service.  
 2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Primary Wind Turbine
- Alternate Wind Turbine
- - - Cable Route Envelope
- Staging Area
- O&M Center Parcel
- Substation Parcel



## 2.2 Proposed Project

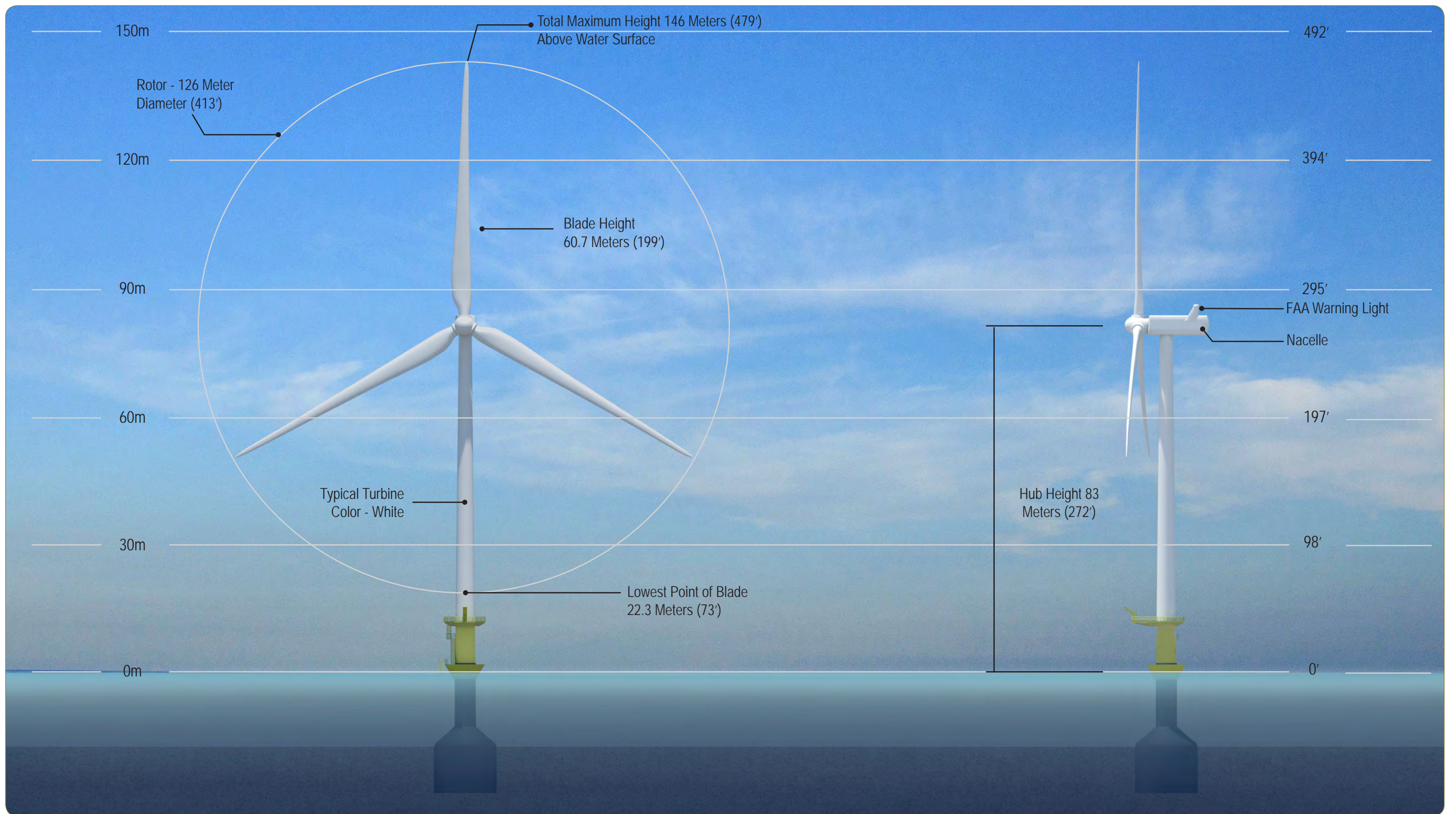
The proposed Project evaluated in this VIA is a wind-powered electric generating facility, consisting of six Vestas 3.45 megawatt (MW) off-shore wind turbines. Along with the turbines, the Project includes associated support facilities including buried/under water electrical collection and transmission cables, an on-shore substation, meteorological tower, and O&M facility. Project configuration/layout is illustrated in Figure 2. The major components of the proposed Project are described below:

### 2.2.1 Wind Turbines

Each Vestas V126 3.45 MW turbine consists of four major components: the foundation, the tower, the nacelle, and the rotor. The turbines' proposed hub height (height from the water surface to the rotor hub) is 272 feet (83 meters). The nacelle sits atop the tower, and the rotor hub is mounted to the front of the nacelle. The rotor has a diameter of 413 feet (126 meters), and the maximum total turbine height (i.e., the height at the highest blade tip position) is 479 feet (146 meters). Descriptions of each of the turbine components are provided below, and a computer model illustrating the appearance of the off-shore wind turbine used in this assessment is shown in Figure 3.

*Foundation:* A Mono Bucket (MB) foundation will be used for the proposed Project. The MB will be 55.8 feet (17.0 meters) wide, narrowing to a shaft diameter of 13.8 feet (4.2 meters) wide. Overall, the foundation will be 121 feet (36.9 meters) tall. The MB is a Suction Installed Caisson (SICA) or an "all-in-one" steel foundation system to support off-shore wind turbines. The interface with the lakebed is accomplished by means of a steel skirt that penetrates the lake substrate. This steel skirt is welded to an upper steel tube and transition piece that resembles the elements above the mudline of a standard monopile. The entire MB foundation (except for approximately 6.6 feet of the ice cone attached to the monopole at and just below water level) will be located beneath the lake surface, and therefore is not a visible component of the proposed Project.





**Icebreaker Wind**

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

**Figure 3:** Computer Model of Proposed Wind Turbine: Vestas V126 3.45MW (87m Hub Height)

January 2017





*Tower:* The towers used for megawatt-scale turbines are tubular conical steel structures manufactured in multiple sections. For the purposes of this study, the tower is assumed to have a base diameter of 15.9 feet and a top diameter of 9.9 feet. Each tower will have a railed deck and an entrance door at its base, and an internal safety ladder to access the nacelle. Two amber U.S. Coast Guard (USCG) warning lights will be mounted on the deck of each tower. Lights on the outer two turbines (ICE1 and ICE6) will have a range of 5 miles and a synchronized quick flash, the rate of flashes is yet to be determined. Lights on the four interior turbines (Turbines ICE2 – ICE5) will have a range of 4 miles, and a synchronized flash rate of 20 flashes per minute (FPM). The towers will be light gray (RAL 7035) above the deck, and yellow in color below the deck.

*Nacelle:* The main mechanical components of the wind turbine are housed in the nacelle. These components include the drive train, gearbox, and generator. The nacelle is approximately 48.7 feet long, 15.7 feet tall, and 16.0 feet wide, and light gray in color. The nacelle is equipped with an external anemometer and a wind vane that signals wind speed and direction information to an electronic controller. Attached to the top of all nacelles, per specifications of the FAA, will be a single aviation warning light (plus a back-up light). These lights are anticipated to be flashing, medium-intensity red strobes (L-864) that operate only at night. For the purposes of this study it is assumed that the nacelle will include no obvious lettering, logo, or other exterior marking.

*Rotor:* A rotor assembly is mounted to the nacelle to operate upwind of the tower. Each rotor consists of three composite blades that will be 220 feet (61.7 meters) in length, which results in a total rotor diameter of 413 feet (126 meters). Like the remainder of the turbine, the blades will be painted light gray to avoid the need for daytime FAA lighting. The rotor attaches to the drive train at the front of the nacelle. The rotor blades are rotated along their axis or “pitched” to enable them to operate efficiently at varying wind speeds. The wind turbines will begin generating energy at wind speeds as low as 3 meters per second (m/s) [6.7 miles per hour (mph)], and cut out at a wind speed of 22.5 m/s (50.3 mph).

### 2.2.2 Electrical System

The proposed Project will have an electrical system consisting of three parts: 1) a collection system consisting of underwater/buried 34.5 kV shielded and insulated inter-array and transmission cables, 2) a short section of overhead transmission line from the cable landfall site to the proposed substation site, and 3) a collection substation (“Project Substation”) that will step up voltage and interconnect with the existing electrical grid. Each of these electrical system components is described below.

*Collection System:* The Facility will require the installation of approximately 12.1 miles of new 34.5 kV buried transmission cable to link each turbine (inter-array cables) and connect the turbine array to shore (export cable). The export cable will proceed from Turbine 1 (ICE1) in a southeasterly direction for approximately 8.5 miles where it will pass underneath the Cleveland Harbor Breakwater and under the remaining portion of the Cleveland Harbor to the Project Substation site. Because the entire collection system will be underwater/buried, it is not a visible component of the Project, and therefore is not evaluated in this VIA.

*Overhead Transmission Line:* The Applicant will construct approximately 150 feet of new 138 kV overhead generator lead line, to transmit electricity from the Project Substation to the existing CPP Lake Road Substation. The overhead line will be a 3-phase, 138 kV circuit that will run approximately 150 feet in a single span from an H-Frame structure in the Project Substation to an H-Frame structure in the existing Lake Road Substation. Transmission structures will be gray galvanized steel.

*Collection Substation:* A new Project Substation will be constructed on CPP property adjacent to the existing Lake Road Substation. The collection substation will be enclosed within a fenced area approximately 88 feet wide by 150 feet long. The Project Substation will include bus structures, switch gear, the step-up transformer, and an 18 by 30 foot building for control equipment. Final color of all substation equipment will be ANSI 70 gray. Bus support structures and dead-end H-Frame will be gray galvanized steel. Substation components are relatively low in height and have limited solid mass. Consequently, they are generally only visible from foreground locations. Public vantage points around the proposed substation are minimal since the proposed substation site is situated between Interstate 90, the CPP Lake Road Generating Station, and the Burke Lakefront Airport. The proposed substation will include relatively low profile structures amongst existing industrial infrastructure. It is anticipated that the visual impact associated with the addition of the collection substation and associated overhead transmission line will be minimal, and therefore, these components of the Project are not the subject of further evaluation in this study.

### 2.2.3 Meteorological Tower

As part of the proposed Project, a permanent meteorological tower was installed at the Cleveland Water Intake Crib in 2005. The Crib consists of a 100-foot diameter steel water intake structure and is located on Lake Erie, approximately 3.7 miles off-shore from the Cleveland waterfront. The location of the meteorological tower on the Crib is illustrated in Figure 2. Total tower height is 166 feet (50 meters) above lake level. The tower has six booms that are each 10 feet long: two booms at each height of 98 feet, 131 feet, and 164 feet (30 meters, 40 meters, and 50 meters, respectively).



Three booms are oriented northwest (315°) and three are oriented south (180°), and each includes an anemometer and a wind vane. The Applicant does not anticipate making any modifications to this meteorological tower or the existing Crib structure, therefore, the visibility and visual impact of the meteorological tower is not evaluated in this VIA.

#### 2.2.4 Operations and Maintenance Center

The Project O&M Center will be located at the existing Great Lakes Towing (GLT) building on the Cuyahoga River in Cleveland, Ohio. The GLT site is approximately 6.3 acres in size, but the anticipated area to be leased for the Project O&M facility will not exceed 0.5 acre. The Applicant does not anticipate making any modifications to the existing building. Consequently, the O&M facility should be compatible with the existing landscape, and is not evaluated as part of this study,

#### 2.2.5 Laydown Staging/Areas

The Applicant will lease space from the Port of Cleveland to stage the major Facility components, including the turbines, foundations, and collection system cable. The site will also be used to pre-assemble and test some of the components prior to installation off-shore. The turbine components, and the cable will be loaded from the laydown/staging area onto feeder barges, and then transported to the installation sites. The laydown/staging area that will be utilized by the Applicant is approximately 12 acres in size. The site currently consists of large paved and unpaved staging areas adjacent to the Cleveland Harbor. Site preparation will be limited to minor and temporary construction of security fencing and installation of temporary office trailers and secured storage areas. Cranes and other material handling equipment will be mobilized to support the loading and unloading of components and materials prior to their transport to the off-shore turbine sites. Following the completion of Project construction, the material handling equipment will be demobilized and returned to the supplier, the chain link fencing will be disassembled and removed, and the office trailers will be returned to the supplier. Because the laydown/staging area is a temporary facility within a working port area, its visual impact is not evaluated in this study.

### ***3.0 Existing Visual Character***

Chapter 4906-4-08(D)(4) of the Ohio Administrative Code (OAC), Certificate Applications for Electric Generation Facilities, indicates that visual impacts to recreational, scenic, and historic resources from a proposed facility should be evaluated within at least a 5-mile radius (OPSB, 2015), and any resources valued specifically for their scenic quality should be evaluated within a 10-mile radius. A 10-mile radius study area around all of the proposed turbines (including the Alternate Turbine) was used for the Icebreaker visual study area, due to the location of the turbines 8 to 10 miles off-shore in Lake Erie. The 10-mile radius study area encompasses a total of approximately 370.6 square miles, and the landward portion of this area includes 24.7 miles of Lake Erie shoreline and 28 square miles of Cuyahoga County. Additional communities that occur within 10 miles of the proposed Facility include six cities (Bay Village, Cleveland, Fairview Park, Lakewood, Rocky River, and Westlake); one village (Bratenahl). The location and extent of the visual study area is illustrated in Figure 4.



### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 4: Visual Study Area

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Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" Map Service.

2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Primary Wind Turbine
- Alternate Wind Turbine
- Lake Erie Shoreline Dividing On-Shore and Off-Shore Study Areas
- 10-Mile Visual Study Area



### 3.1 Physiographic/Land Use Setting

The Project site is located 8 to 10 miles out into Lake Erie. The proposed location is a broad expanse of open water that is devoid of islands or man-made structures, buoys or navigational aids. Consequently, the turbine sites are completely unscreened by foreground vegetation, topography or structures. However, given the amount of existing development along the lake shore, views of the Project site from on-shore locations are typically fragmentary or non-existent beyond the first road south of the lake shore.

The proposed turbines are positioned in an area of the lake where the water is approximately 63 feet deep. This area is characterized by relatively uniform lakebed topography that slopes downward from southeast to northwest. Recent, Holocene-aged sediments blanket the lake bottom in the proposed Project area. The sediments are predominantly soft, fine-grained, and unconsolidated to normally consolidated deposits composed of clay-sized particles with a lesser percentage of silt-sized particles, which increase with depth. The lake-bottom sediment overlays a sequence of late Pleistocene glacial and post glacial sediments. Borings at two proposed turbine sites indicate approximately 72.2 feet (22 meters) of sediment over the bedrock beneath Lake Erie.

The area surrounding the proposed Project Substation is either waterfront, open water (Cleveland Harbor) or developed land. Adjacent development includes the CPP Lake Road Substation and Generating Station, Lake Side Yacht Club to the west, Forest City Yacht Club to the east and Burke Lakefront Airport to the west. The proposed substation property contains some ornamental trees and shrubs around the buildings, and a narrow row of trees lining much of the immediate lakeshore (which is hardened shoreline). The narrow, vegetated area between the existing substation buildings and the lakeshore is less than 40 feet (12.2 meters) and contains sparse trees, shrubs, and herbaceous growth.

A portion of the underwater cable and Project Substation fall within the local jurisdiction of the Port of Cleveland. The Board of Directors of the Port has considered and approved a resolution concluding that the land requested by the Applicant in its SLL application is in accordance with the permissible land uses identified in the Port's waterfront plan. The Project also creates potential for the Port to be redeveloped to handle product delivery, staging, assembly, and vessel loading. In addition, the proposed Facility aligns with the goals of the City of Cleveland Planning Commission's Connecting Cleveland 2020 Citywide Plan.

## 3.2 Landscape Similarity Zones

Definition of discrete landscape types within a given study area provides a useful framework for the analysis of a project's potential visual effects. These landscape types, referred to in this report as Landscape Similarity Zones (LSZs), are defined based on the similarity of various landscape features, including landform, vegetation, water, and/or land use patterns, in accordance with established visual assessment methodologies (Smardon et al., 1987; USDA Forest Service, 1995; USDOT Federal Highway Administration, 1981; USDI Bureau of Land Management, 1980). Within the 10-mile radius visual study area, 10 major landscape similarity zones (LSZ) were defined. Land cover data from the Cuyahoga County Geographical Information Systems Department (2014) that were used to help define the location of these zones is illustrated in Figure 5. The general landscape character, use, and potential views to the proposed Project within each of the LSZs are described below. Additionally, the area of each LSZ that occurs along the Lake Erie waterfront (defined as areas within 200 feet of the Lake Erie shoreline) is quantified, as these areas generally have the best potential for Project visibility and a heightened degree of visual sensitivity. Waterfront areas are further split into lake-level waterfront (less than 600 feet above mean sea level [amsl] in elevation) and elevated waterfront (greater than 600 feet amsl in elevation). Elevated waterfront areas are likely to offer the most open and expansive views of Lake Erie and, therefore, are likely associated with the highest sensitivity to visual quality and visual change with respect to lake views.

### 3.2.1 Zone 1: Open Water/Lake Zone

This zone includes the open water of Lake Erie and areas along the lake shoreline with unobscured off-shore views. The character-defining component of this LSZ is the presence of open water as a dominant foreground element of the view. The open expanse of water is relatively flat, but at times includes waves and white caps. Man-made features in the water are limited, but include occasional buoys and boats. Views across the open water extend to the horizon or to the adjacent shoreline, depending on the location and orientation of the viewer (see Photo Insets 1 and 2). Lake Erie and the Cleveland shoreline receive substantial use by the public, especially during the recreation season. This includes commercial shipping, pleasure boating, recreational fishing, and shoreline recreation.



Inset 1 – Open Water LSZ



Inset 2 – Open Water LSZ (Source: Icebreaker Windpower Inc.)

### 3.2.2 Zone 2: Suburban Residential Zone

The suburban residential LSZ is the dominant on-shore landscape type, covering over 41% of the landward portion of the study area. This zone is prevalent throughout all portions of the on-shore study area, except for the downtown Cleveland area. The landscape in this zone is characterized by gently sloped topography descending toward Lake Erie, and relatively uniform coverage by residential streets, closely-spaced 1-2 story residential structures, and yard trees (see Photo Inset 3). Residential structures are primarily single-family residences, but also include duplexes and townhouses. Homes are typically in good condition and well cared for. Most homes exist amongst mature, well established landscaping, including large trees on the properties and street sides. Views in this zone are generally oriented toward the street and residences across the street. In the inland residential areas, views toward Lake Erie are restricted by intervening trees and homes. While only approximately 170 acres of this LSZ (1.1% of the landward study area) occur along the Lake Erie waterfront (30 acres defined as lake-level waterfront and 140 acres defined as elevated waterfront), these areas are a significant subset of this LSZ in that they are the most likely to have open views of Lake Erie, and therefore have increased sensitivity to visual quality and visual change. Very little of this LSZ occurs within Cleveland's waterfront area, but the majority of waterfront in Bay Village, Rocky River, and Lakewood is within the Suburban Residential LSZ.



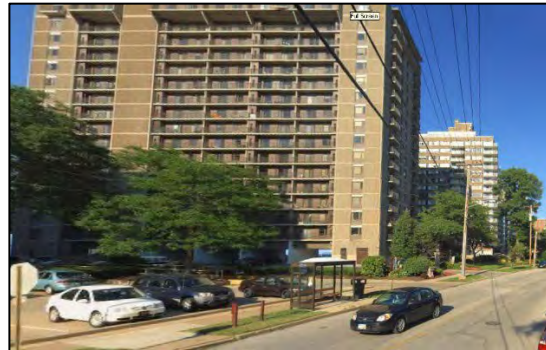
Inset 3 – Suburban Residential LSZ at Lake Park Drive, Bay Village

### 3.2.3 Zone 3. High-Density Residential Zone

The High-Density Residential LSZ consists of areas occupied by apartment buildings and condominiums as well as associated parking lots and courtyards (see Photo Inset 4 and 5). These areas cover approximately 4.6% of the landward portion of the study area and are found scattered throughout the visual study area. The High Density Residential LSZ occurs most commonly along main roads and adjacent to commercial areas. Residential structures within this LSZ are multistoried and are often situated to take advantage of views toward Lake Erie. Approximately 27 acres of the High-Density Residential LSZ (0.2% of the landward study area) occurs along the Lake Erie waterfront (11 acres defined as lake-level waterfront and 16 acres defined as elevated waterfront). The largest concentration of this LSZ along the waterfront occurs on the east side of Lakewood, along Edgewater Drive and Lake Avenue.



Inset 4 – High Density Residential LSZ at Globe Machine and Stamping Company, Cleveland



Inset 5 – High Density Residential LSZ at Edgewater Drive, Lakewood (Source: Bing)

### 3.2.4 Zone 4. Developed Open Space Zone

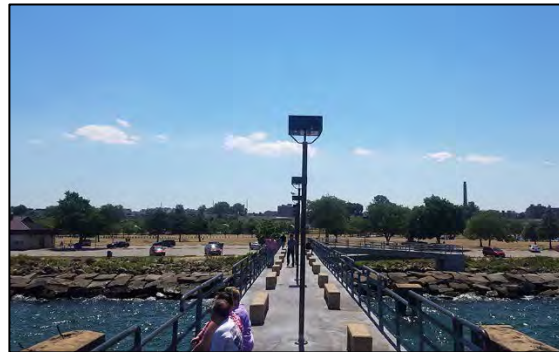
The Developed Open Space LSZ includes major urban parks, such as Edgewater Park and Lakewood Park as well as golf courses, and cemeteries, and outdoor sports and educational venues such as First Energy Stadium, Quicken



Loans Arena, Progressive Field, and the Wolstein Center (see Photo Insets 6 and 7). This LSZ is found scattered throughout the landward portion of the study area but is slightly more prevalent in the City of Cleveland. Views from this LSZ are highly variable, depending on the location, extent of development, and surrounding vegetation and structures. Approximately 132 acres of the Developed Open Space LSZ (0.9% of the landward study area) occurs along the Lake Erie waterfront (114 acres defined as lake-level waterfront and 18 acres defined as elevated waterfront). The majority of this waterfront acreage occurs in Cleveland, including open space areas such as Edgewater Park, Wendy Park, Great Lakes Science Center, East 55<sup>th</sup> Street Marina, and Gordon Park.



Inset 6 – Developed Open Space LSZ at Lakewood Park, Lakewood



Inset 7 – Developed Open Space LSZ at Edgewater Park, Cleveland

### 3.2.5 Zone 5. Commercial Zone

The Commercial zone is characterized by retail and commercial buildings, typical large multistory structures, located along main roads throughout the study area (see Photo Insets 8 and 9). The buildings include a variety of materials, sizes, and styles, and may accommodate commercial operations on the street level and residential apartments on the upper levels (mixed use). The types of commerce include boutique style shops along with larger chain operations. Pedestrians within this zone experience wide streets lined with sidewalks, leading up to multistory structures which enclose the views along the street axis (see Photo inset 9). Some locations (e.g., sections of Detroit Avenue) have a village feel, with pedestrian scale lighting and plantings. The commercial areas are mostly concentrated several blocks inland from the Lake Erie shoreline, and as mentioned previously, the views from within the commercial zone are focused along the road axis. Because of these two factors, views of the Project will not typically be available from within the commercial zone.





Inset 8 – Commercial LSZ at Lake Road (State Route 6), Bay Village



Inset 9 – Commercial LSZ at Detroit Avenue, Bay Village (Source: Bing)

### 3.2.6 Zone 6. Undeveloped Open Space Zone

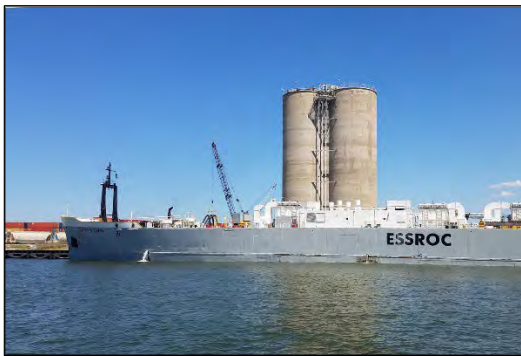
The Undeveloped Open Space LSZ consists of conservation land, including the Rocky River Reservation along the Rocky River and the Cleveland Lakefront Nature Preserve. This LSZ has a natural character that stands in stark contrast to the urban surroundings that dominate the landward portion of the study area. The Rocky River Reservation is known for its shale cliffs overlooking the Rocky River and its sizable floodplain forests. The Cleveland Lakefront Nature Preserve (Photo Inset 10) lies on a man-made peninsula extending into Lake Erie east of downtown Cleveland. This preserve includes a mix of grassland, forest, shrubland, and wetlands areas. This LSZ also includes a portion of the Cuyahoga River's western shore in Cleveland. The undeveloped nature of this LSZ suggests high viewer sensitivity to visual quality, although outward views from this LSZ include a significant amount of development in most cases. A notable exception would be the outward views toward Lake Erie available from the approximately 25 acres of elevated waterfront that line the periphery of the Cleveland Lakefront Nature Preserve.



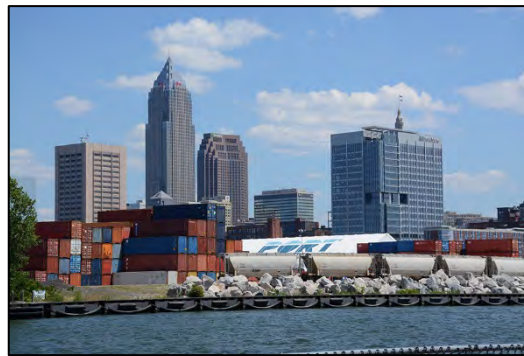
Inset 10 – Undeveloped Open Space LSZ at Cleveland Lakefront Preserve, Cleveland

### 3.2.7 Zone 7. Industrial Zone

The Industrial LSZ is located around the periphery of downtown Cleveland and extends out along railroad rights-of-way into the outskirts of the city. There are a few smaller areas of this LSZ located in the western portion of the landward study area. The Industrial LSZ includes warehouses, manufacturing facilities, automobile-related uses, port and rail facilities, industry-related offices, and utilities (see Photo Insets 11 and 12). The Port of Cleveland is a major center for national and international freight transfer, including iron-ore and other raw and industrial materials. This zone is characterized by a varied mix of building types, large freight vessels and rail infrastructure. There are no uniform set-backs, and little structure or order to the streetscape. Views within this zone are generally enclosed/directed by large low structures and stockpiled materials, but the immediate waterfront area offers expansive lake views. Approximately 134 acres of the Industrial LSZ (0.9% of the landward study area) occurs along the Lake Erie waterfront (133 acres defined as lake-level waterfront and 1 acre defined as elevated waterfront). These areas are all located within the City of Cleveland and include the Port of Cleveland, the Burke Lakefront Airport, and the C&P Ore Docks.



Inset 11 – Industrial LSZ at Whiskey Island, Cleveland



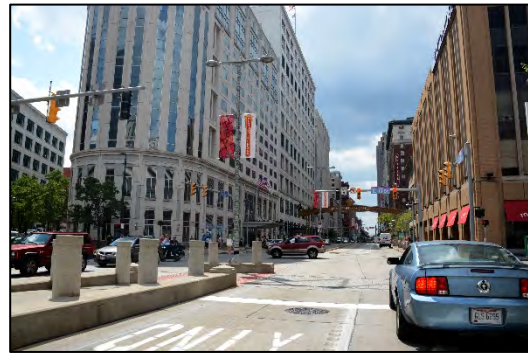
Inset 12 – Industrial LSZ at Whiskey Island, Cleveland

### 3.2.8 Zone 8. Urban Core Zone

The Urban Core LSZ includes downtown Cleveland and is characterized by closely stacked, multiuse, high-rise buildings, city parks, grid pattern streets, parking facilities, and cultural centers. Buildings within Cleveland's urban core include a variety of architectural styles, including neoclassical, Beaux-Arts, Art Deco and postmodern. The buildings are closely situated along city streets. The pedestrian experience within the LSZ includes tall structures with human-scale elements at street level, such as street trees, ornamental lights, wide sidewalks, and awnings on the lower floors of buildings (see Photo Insets 13 and 14). The Urban Core LSZ extends from the Cleveland waterfront, where lake views are prevalent, to inland areas where views toward the lake are only available from the upper floors of high-rise buildings.



Inset 13 – Urban Core LSZ – From Cleveland Public Square



Inset 14 – Urban Core LSZ from East 9<sup>th</sup> Street, Cleveland

### 3.2.9 Zone 9. Highway Transportation Zone

The Highway Transportation LSZ occurs in the central portion of the study area running in an east-west direction along the Lake Erie waterfront. The Highway Transportation zone includes high volume, limited access highways such as, Interstate Route 90 and State Route 2, which transect the entire 10-mile visual study area in an east-west direction. This LSZ is a vehicular travel corridor dominated by automobiles, pavement, guardrails, and signs (see Photo Insets 15 and 16). Views are focused on the roadway and associated traffic. Travel is generally at high speeds, and outward peripheral views are fleeting. The surrounding scenery is variable, but within the study area is dominated by adjacent buildings to the south, and views toward Lake Erie to the north.



Inset 15 – Transportation LSZ - From Gordon Park overlooking East 72nd street



Inset 16 – Transportation LSZ – From Interstate 90 (Source: Bing)

### 3.2.10 Zone 10. Harbor Waterfront Zone

The Harbor Waterfront LSZ includes areas that are centralized around water-related activities and include recreational and commercial facilities and activities such as marinas, fishing charters, recreational boating and associated landward facilities. These areas exist mainly within the City of Cleveland and include low profile support buildings, docks, and sheltered bays and harbors (see Photo Insets 17 and 18). Typically, outward views toward Lake Erie include linear

breakwater structures and adjacent industrial, residential, and urban core components. However, the views are generally expansive and the intervening structures are typically low profile, thus allowing open views toward the proposed Project site.



Inset 17 – Harbor Waterfront LSZ - From USS COD, Cleveland



Inset 18 – Harbor Waterfront LSZ - From Wendy Park, Cleveland

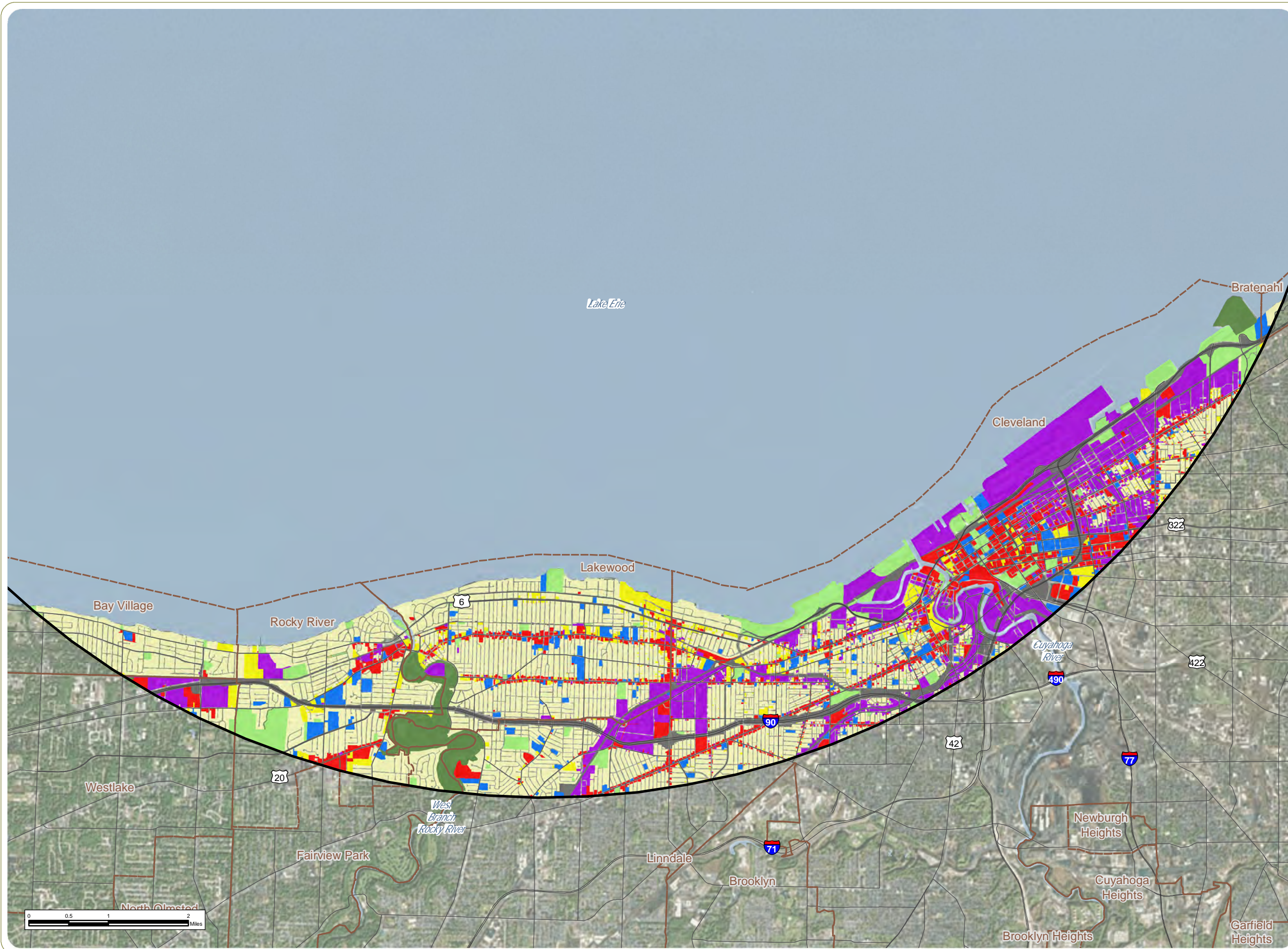


# Icebreaker Wind

Lake Erie, City of Cleveland  
Cuyahoga County, Ohio

Figure 5: Land Use Map

January 2017



- 10-Mile Visual Study Area
- City/Village Boundary
- Land Use
  - Commercial
  - Developed Open Space
  - Undeveloped Open Space
  - Medium Density Residential
  - High Density Residential
  - Industrial
  - Institutional
  - Transportation Corridor
  - Open Water

Notes:  
1. Land use derived from Cuyahoga County GIS Department 2014 land use data.  
2. Basemap: ESRI ArcGIS Online "World Imagery" Map Service.  
3. This is a color graphic. Reproduction in grayscale may misrepresent the data.





### 3.3 Viewer/User Groups

Three categories of viewer/user groups were identified within the visual study area. These include the following:

#### 3.3.1 Local Residents

Local residents include those who live and work within the visual study area. They generally view the landscape from their yards, homes, local roads and places of employment. Residents are concentrated in and around the Cities of Cleveland, Bay Village, Fairview Park, Lakewood, Rocky River and Westlake. However, residents occur throughout the visual study area. Except when involved in local travel, residents are likely to be stationary and have frequent or prolonged views of the landscape. Local residents may view the landscape from ground level or elevated viewpoints (typically upper floors/stories of homes and apartment buildings). Residents' sensitivity to visual quality is variable, however, it is assumed that residents may be very sensitive to changes in particular views that are important to them.

#### 3.3.2 Through Travelers/Commuters

Commuters and travelers passing through the area view the landscape from motor vehicles on their way to work or other destinations. Commuters and through travelers are typically moving, have a relatively narrow field of view, and are destination oriented. Drivers on major roads in the area (e.g., Interstate Route 90 and State Route 2) will generally be focused on the road and traffic conditions, but do have the opportunity to observe roadside scenery. Passengers in moving vehicles will have greater opportunities for prolonged off-road views than will drivers, and accordingly, may have greater perception of changes in the visual environment.

#### 3.3.3 Tourists/Recreational Users

Recreational users and tourists include local residents and out-of-town visitors involved in cultural and recreational activities at parks, recreational facilities, museums and sports stadiums, as well as in undeveloped natural settings such as the Cleveland Lakefront Nature Preserve and Lake Erie. These viewers are concentrated in the developed and undeveloped recreational facilities/cultural sites located within the visual study area. Members of this group may view the landscape from area highways while on their way to these destinations, or from the sites themselves. This group includes bicyclists, recreational boaters, fishermen, sports spectators, visitors to the Rock and Roll Hall of Fame, and those involved in more passive recreational activities (e.g., picnicking, sightseeing, or walking) at venues such as Edgewater Park. Visual quality may or may not be an important part of the recreational experience for these viewers.

However, for some, scenery will be a very important part of their experience, and in almost all cases enhances the quality of recreational experiences. Recreational users and tourists engaged in outdoor activities will often have continuous views of landscape features over relatively long periods of time, and will typically view the surrounding landscape from ground or water-level vantage points.

### 3.4 Visually Sensitive Resources

The 10-mile radius visual study area includes several sites that could be considered scenic resources of statewide significance. These include 122 sites and 25 districts listed on the National Register of Historic Places (NRHP), of which, 111 NRHP-listed sites and 23 NRHP-listed districts occur within the City of Cleveland. These sites include 16 houses, nine apartment buildings, eight churches, one hospital, two hotels, four schools, one library, one country club, three bridges, one submarine, two pierhead lights, and one U.S. Coast Guard station. The remaining 73 NRHP-listed historic sites are buildings used for industrial/engineering, warehouse, commercial, and mill/processing/manufacturing. There are eight residential historic districts (Birdtown Historic District, Clifton Park Lakefront District, Franklin Boulevard-West Clinton Avenue Historic District, Franklin Boulevard Historic District, Ohio City Preservation District, Prospect Avenue Row House Group, Scranton South Side Historic District, and Tremont Historic District), 13 commercial historic districts, one recreational historic district (Rockefeller Park and Cleveland Cultural Gardens Historic District), one set of bridges (Rockefeller Park Bridges), one school district (West Technical High School), and one archaeological district (Irishtown Bend Archaeological District). Many of these are also Designated Cleveland Landmarks and Districts. Other historic resources within the 10-mile visual study area include 81 potentially eligible NRHP sites and 24 State Historic Markers.

NRHP-listed sites and districts likely to experience the most uninterrupted views of the Project, are those located along the Lake Erie shoreline. These include the Universal Terminal Company Dock and Warehouse, USS COD (submarine), U.S. Coast Guard Cleveland Harbor Station, and Cleveland East and West Pierhead Lights, as well as the Clifton Park Lakefront District, all of which are described below.

The Universal Terminal Company Dock and Warehouse, also known as the Nicholson Cleveland Terminal, is a 220,000 square foot building built in 1929. The facility was used as a dock and short-term storage facility for newsprint and cars, as well as other general cargo, unloaded from steamships arriving from Detroit (The Cleveland Memory Project, 2016). The facility was in use until 1974, when the company was forced out of business by competition from railroads and larger, ocean-going freighters. In 2003, the building was converted into an upscale apartment and mixed-use facility and is currently known as Quay 55 (USACE, 2010).

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The USS COD is an SS-224 World War II fleet submarine, currently docked in Cleveland, Ohio. The submarine is also a National Historic Landmark. The submarine was placed in commission on June 21, 1943, and from then until August 1945, it was used in several World War II missions. Recommissioned in 1951, the submarine participated in NATO anti-submarine training exercises and then Cold War missions until 1954, when it was decommissioned. In 1959 the submarine was towed through the newly opened St. Lawrence Seaway to serve as a naval reserve training vessel in Cleveland, Ohio and removed from the register of Navy ships in 1971. In 1976 the submarine was opened for public tours and listed as a National Historic Landmark in 1986 (Farace, 2009).

The U.S. Coast Guard Cleveland Harbor Station is located on Lake Erie, along the old World War II era piers on East 9<sup>th</sup> Street in Cleveland. The unit has been located at this site since 1976, and has been involved in search and rescue missions on the Great Lakes since 1875, during the times of the U.S. Lifesaving Service. The station is still involved in missions, from search and rescue and recreational boating safety, to ports, waterways, and coastal security (U.S. Coast Guard, 2016a).

Cleveland East and West Pierhead Lights are located at the breakwater pierhead entrance to the Port of Cleveland, where the U.S. Coast Guard Station is located, as well the entrance to the Cuyahoga River (U.S. Coast Guard, 2016). Construction was finished on the current west lighthouse, also known as the Cleveland Harbor Main Entrance Lighthouse, as well as the east pierhead light, in 1911 (U.S. Coast Guard, 2016b)

There is one historic district, the Clifton Park Lakefront District, located along Lake Erie, which is 940 acres in size and consists of 21 single dwellings. This area was conceived by a group of real estate developers in the late 1800's, who commissioned Ernest W. Bowditch, a famed landscape architect, to create a summer resort destination along the bluffs of Lake Erie down to the estuary of Rocky River. Curvilinear roads lined with a variety of estate homes set this area apart from the typical gridded street pattern. The success of the lakefront resort paved the way for the construction of several homes designed by notable architects and commissioned by well-known industrialists and business people (Knapp, 2016). Today the district is comprised of many large estate homes interspersed with an abundance of mature trees and well maintained landscapes.

There are no State Parks, State Forests, National Wildlife Refuges, National Park Service Lands, National Natural Landmarks, State Wildlife Management Areas, State Nature Preserves, federally designated trails, or state or federally designated wild, scenic, or recreational rivers, within the visual study area. However, there is also one national heritage area (Ohio & Erie Canalway National Heritage Area), two national scenic byways (Lake Erie Coastal Ohio Scenic Byway and Ohio & Erie Canalway Scenic Byway), one scenic overlook (Stinchcomb-Groth Memorial Scenic Overlook),



and one state designated bike trail (Ohio & Erie Canal Towpath Trail) that could also be considered resources of statewide significance.

The Ohio & Erie Canalway National Heritage Area is located 8.2 miles from the nearest proposed turbine, and includes portions of the City of Cleveland and the Village of Bratenahl, within the visual study area. The National Heritage Area was designated by Congress in 1996 to help preserve and celebrate the rails, trails, landscapes, towns, and sites that developed along the first 110 miles of the Ohio & Erie Canal. The Ohio & Erie Canal stretched from Cleveland to New Philadelphia, Ohio, and was built to provide a link between Lake Erie and the Ohio River, which completed an inland water route between the East Coast and the Gulf of Mexico. The canal provided a connection between Ohio, New York, and New Orleans, allowing for transportation of raw materials from Ohio to growing cities and industries nationwide (Ohio & Erie Canalway, 2016b).

The Ohio & Erie Canalway Scenic Byway was designated an Ohio State Scenic Byway in 1996 and a federally-designated America's Byway in 2000. The byway is a 110-mile route through four counties and 58 communities in the Ohio & Erie Canalway National Heritage Area (see description above). Along the northern portion of the canalway, within the visual study area, the scenic byway passes factories, warehouses, and a steel mill, important to Ohio's industrial era (America's Byways, 2016b; ODOT, 2016d).

The Lake Erie Coastal Ohio Scenic Byway spans 293 miles along the Lake Erie shoreline. Within the visual study area the byway crosses the Cities of Bay Village, Lakewood, Rocky River, Cleveland, and the Village of Bratenahl. The byway offers opportunities for shopping, fishing, birding, biking, boating, camping, touring, and exploring along the lake shoreline (America's Byways, 2016c; ODOT, 2016e)

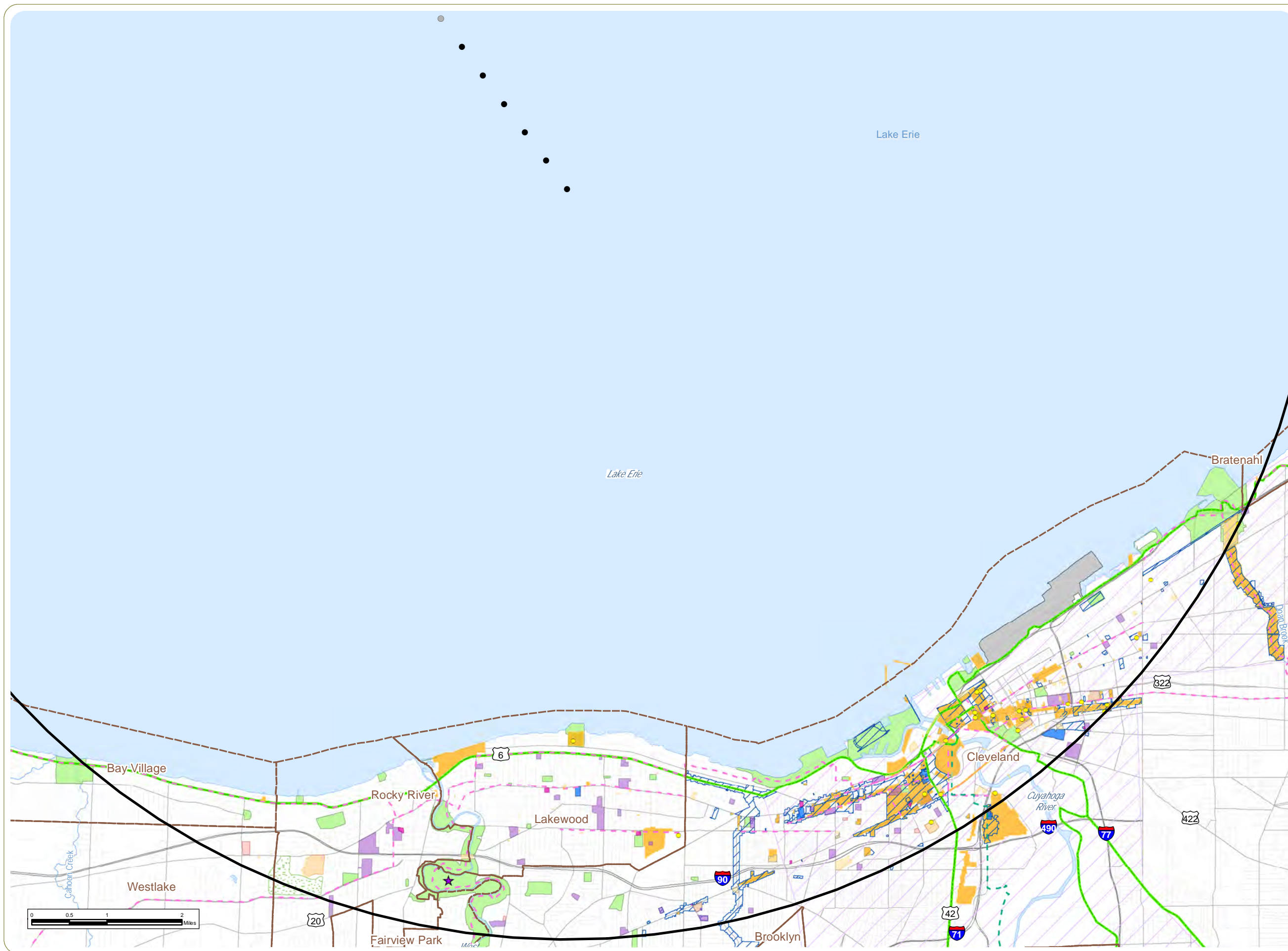
The Stinchcomb-Groth Memorial Scenic Overlook is located in the City of Cleveland, 9.3 miles from the nearest proposed turbine. The overlook is a 30-foot tower made of cinder block and sandstone. The overlook was dedicated in 1958 to the first two directors of Cleveland Metroparks, William Stinchcomb and Harold Groth, who were responsible for establishing 18,000 acres of parkland and 84 miles of parkway in the City of Cleveland (Cleveland Metroparks, 2016b).

The Ohio & Erie Canal Towpath Trail traverses the City of Cleveland within the visual study area. Annually, approximately 2.5 million people use the 85-mile Towpath Trail that runs through the Ohio & Erie Canalway. The trail provides opportunities for birding, biking, hiking, running, horseback riding, and boating (Ohio & Erie Canalway, 2016c).

Beyond these scenic resources of statewide significance, the 10-mile radius study area also includes areas that could also be considered regionally or locally significant/sensitive, due to the type or intensity of land use they receive. These include the designated Cleveland landmarks and districts previously mentioned, as well as various golf courses, local parks, local bike routes, water bodies, schools, hospitals, libraries, cemeteries, areas of concentrated human settlement (Cities of Cleveland, Lakewood, Westlake, Bay Village, Fairview Park, and Rocky River, as well as the Village of Bratenah), and heavily traveled highways.

One unique local resource is Lakefront Reservation, which is managed by Cleveland Metroparks through a 99-year lease agreement with the City of Cleveland (the property owner). Lakefront Reservation is comprised of six lakefront parks, four of which are located within the visual study area: Edgewater Park, Whiskey Island, E. 55<sup>th</sup> Street Marina, and Gordon Park (located 8 miles, 8.2 miles, 8.9 miles, and 9.3 miles from the nearest proposed turbine, respectively). The six properties consist of about 511 acres scattered along 14 miles of Lake Erie lakefront property. The areas were once known as Cleveland Lakefront State Park, during which time the Ohio Department of Natural Resources leased the properties from the City of Cleveland in an effort to improve the parks. During this time shorelines were protected, new concessions and a new park office were built, beaches and picnic facilities were improved, and historic features were renovated (ODNR, 2016f). In 2013, Cleveland Metroparks took over management of the parks and the area was renamed Lakefront Reservation. There are a number of amenities and activities available at the lakefront properties including walking and biking trails, piers for fishing, boat launch ramps, picnic areas, marinas, bird watching, playgrounds, grills, sandy beaches, swimming, and scenic views of Lake Erie, the downtown Cleveland skyline, and sunsets (Cleveland Metroparks, 2016c).

All inventoried scenic/sensitive resources are listed in Appendix A. The location of mapped visually sensitive resources within the visual study area is illustrated in Figure 6.



## Icebreaker Wind

Lake Erie, City of Cleveland  
Cuyahoga County, Ohio

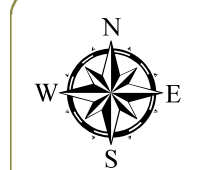
Figure 6: Visually Sensitive Resources

January 2017

- Primary Wind Turbine
- Alternate Wind Turbine
- Ohio Historical Marker
- ★ Scenic Overlook
- - - Bike Route
- - - Bike Route & Trail
- Scenic Byway
- NRHP-Listed Site or District
- NRHP-Eligible Site
- National Heritage Area
- ▨ Designated Cleveland Landmark
- School
- Local Recreation
- Golf Course
- Library
- Hospital
- Airport
- Cemetery
- ▭ City/Village Boundary
- ▭ 10-Mile Visual Study Area

Notes:  
1. Basemap: ESRI StreetMap North America, 2008.

2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



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## 4.0 *Visual Impact Assessment Methodology*

The Visual Impact Assessment (VIA) procedures used for this study are consistent with methodologies developed by the U.S. Department of the Interior, Bureau of Land Management (1980), U.S. Department of Agriculture, National Forest Service (1974), the U.S. Department of Transportation, Federal Highway Administration (1981), and the NYS Department of Environmental Conservation (not dated). Methodologies employed are also consistent with European guidance developed specifically for wind farms (University of New Castle, 2002; Horner & MacLennan and Envision, 2006), and are widely accepted as standard visual impact methodology for wind energy projects (CEIWEF, 2007). The specific techniques used to assess potential Project visibility and visual impacts are described in the following section.

### 4.1 **Project Visibility**

An analysis of Project visibility was undertaken to identify those locations within the landward portion of the visual study area where there is potential for the proposed wind turbines to be seen from ground-level vantage points<sup>2</sup>. This analysis included identifying potentially visible areas on viewshed maps and verifying visibility in the field. It should be noted that the City of Cleveland has a number of high-rise buildings situated in the urban core which will have extended views of Lake Erie. While the viewshed does not take this visibility into account, subsequent field data collection, where possible, did consider elevated vantage points from within the city. The methodology employed for each of these assessment techniques is described below.

#### 4.1.1 Viewshed Analysis

Topographic viewshed maps for the Project were prepared using a bare earth digital elevation model (DEM) derived from the Ohio Statewide Imagery Program's 2006 Light Detection and Ranging (LiDAR) data for Cuyahoga County, the location and height of all proposed turbines (see Figures 2 and 3), an assumed viewer height of six feet, and ESRI ArcGIS® software with the Spatial Analyst extension. To provide a conservative analysis of potential Project visibility, all of the viewshed analyses included an extra turbine at the most distant Alternate Turbine site. Two 10-mile radius topographic viewsheds were mapped; one to illustrate "worst case" daytime visibility (based on a maximum blade tip height of 479 feet above existing grade) and the other to illustrate potential visibility of turbine lights (based on an assumed FAA warning light height of 282 feet above existing grade). The FAA warning light (i.e., 282-foot) viewshed analysis was based on the assumption that all of the turbines would be lit.

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<sup>2</sup> It should also be noted that essentially all of Lake Erie within the 10-mile study area will have some level of Project visibility on clear days.

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The ArcGIS program defines the viewshed (using topography only) by reading every cell of the bare earth (or ground surface) DEM data and assigning a value based upon the existence of a direct, unobstructed line of sight to turbine location/elevation coordinates from observation points throughout the 10-mile study area. The resulting topographic viewshed maps define the maximum area from which any turbine within the completed Project could potentially be seen within the study area during both daytime and nighttime hours (ignoring the screening effects of existing vegetation and built structures). Because the screening provided by vegetation and buildings is not considered in this analysis, the topographic viewsheds represent a "worst case" assessment of potential Project visibility.

In addition, a second-level analysis was conducted to better illustrate the potential screening effect of structures and vegetation, as captured in the Ohio Statewide Imagery Program's 2006 LiDAR data for Cuyahoga County. A digital surface model (DSM) of the study area was created from the LiDAR data, which includes the elevations of buildings, trees, and other objects large enough to be resolved by LiDAR technology. This DSM was then used as a base layer for the viewshed analysis, as described above (using the blade tip and FAA warning light heights as input data). Once the viewshed analysis was completed, a conditional statement was used to set turbine visibility to zero in locations where the DSM elevation exceeded the bare earth elevation by six feet or more, except in locations of known bridges (which were obtained from the Cuyahoga County Geographical Information Systems Department). This was done for two reasons; 1) because in locations where trees or structures are present in the DSM, the viewshed would reflect visibility from the vantage point of standing on the tree top or building roof, which is not the intent of this analysis and 2) to reflect the fact that ground-level vantage points within buildings or areas of vegetation exceeding 6 feet in height will generally be screened from views of the Project. However, it should be noted that where high rise buildings occur in areas indicated as being screened from views of the Project, views may be available from upper stories that have views of Lake Erie. Generally, this will include the taller office and residential buildings scattered throughout the study area.

Because it accounts for the screening provided by structures and trees, this second-level analysis is a more accurate representation of potential Project visibility. However, it is worth noting that because characteristics of the proposed turbines that influence visibility (color, narrow profile, distance from viewer, etc.) are not into taken consideration in the viewshed analyses, being within the vegetation viewshed does not necessarily equate to actual Project visibility.

#### 4.1.2 Field Verification

Visibility of the proposed Project was evaluated in the field on August 3, 4 and 17, 2016. The purpose of the site visits was to verify potential turbine visibility within the landward portions of the study area, and obtain photographs for

subsequent use in the development of visual simulations. Weather conditions in the field on all three days were sunny and clear with low humidity and no cloud cover. The weather conditions were ideal for depicting the highest visibility conditions and therefore the potential “worst case” visual impact of the Project<sup>3</sup>. Consideration was also given to viewer orientation and time of day by strategically capturing a variety of lighting conditions (front lit, side lit and backlit) in the photographs.

During the field verification, an EDR field crew drove public roads and visited public vantage points within the 10-mile radius study area to document points from which the turbines would likely be visible, partially screened, or fully screened. This determination was made based on the visibility of Lake Erie and the water intake Crib, which served as locational and scale references. Photos were taken from 56 representative viewpoints within the study area. Photos were obtained using a Nikon D810 digital SLR camera with a focal length fixed at 50 mm (full frame) and a Nikon D7100 with a focal length between 28 and 35 mm (equivalent to between 45 and 55 mm on a full frame 35mm camera). This focal length most closely approximates the relative scale and perspective relationship of objects in the view (minimal distortion between foreground, mid-ground, and background elements). Viewpoint locations were determined using hand-held global positioning system (GPS) units, high resolution aerial photographs (digital ortho quarter quadrangles), photographs taken of the viewpoint location, and high resolution LIDAR data (to determine elevation). The time and location of each photo were documented on all electronic equipment (camera, GPS unit, etc.) and noted on field maps and data sheets (see Appendix B). Where views existed, viewpoints photographed during field review generally represented the most open, unobstructed available views toward the Project site.

## 4.2 Project Visual Impact

Beyond evaluating potential Project visibility, the VIA also examined the visual impact of the proposed wind turbines on the aesthetic resources and viewers within the visual study area. This assessment involved creating computer models of the proposed Project turbines and layout, selecting representative viewpoints within the study area, and preparing computer-assisted visual simulations of the proposed Project. These simulations were then used to characterize the type and extent of visual impact resulting from Project construction. Details of the visual impact assessment procedures are described below.

### 4.2.1 Viewpoint Selection

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<sup>3</sup> See discussion in Section 5.1.3 regarding the frequency of clear versus overcast days on an annual basis.

From the photo documentation conducted during field verification, EDR selected a total of 13 viewpoints for development of visual simulations. These viewpoints were selected based upon the following criteria:

1. They provide clear, unobstructed views of the Project (as determined through field verification).
2. They illustrate Project visibility from sensitive sites/resources within the visual study area.
3. They illustrate typical views from landscape similarity zones where views of the Project will be available.
4. They illustrate typical views of the proposed Project that will be available to representative viewer/user groups within the visual study area.
5. They illustrate typical views from a variety of viewer distances, orientations, and elevations.
6. They illustrate turbine visibility/contrast under different lighting conditions, to illustrate the range of visual change that will occur with the Project in place.

Location of the selected viewpoints is indicated in Figure 9. Locational details and the criteria for selection of each simulation viewpoint are summarized in Table 1, below:

Table 1. Viewpoints Selected for Simulation and Evaluation

VP	Location	Township	Landscape Similarity Zone	Elevation <sup>1</sup>	Distance to Nearest Turbine	Distance to Furthest Turbine	Direction of View	Date Taken	Time Taken
2	Cahoon Memorial Park Boat Launch	Bay Village	Developed Open Space	579.72	10 mi.	10.8 mi.	Northeast	8/3/2016	8:25
4	Cleveland Lakefront Nature Preserve	Cleveland	Undeveloped Open Space	593.474	9.3 mi.	11.5 mi.	Northwest	8/3/2016	10:28
7	USS COD (Submarine)	Cleveland	Harbor Waterfront	586	8.4 mi.	10.8 mi.	Northwest	8/3/2016	12:12
8	Edgewater State Park Pier	Cleveland	Developed Open Space/Open Water	581.979	8.1 mi.	10.4 mi.	North Northwest	8/3/2016	12:44
9	Edgewater State Park Beach	Cleveland	Developed Open Space	581.241	8.4 mi.	10.7 mi.	North Northwest	8/3/2016	13:13
12	Lakewood Park (John Honam House)	Bay Village	Developed Open Space/Open Water	630.429	7.1 mi.	9.2 mi.	North	8/3/2016	15:58
14	Rocky River Park Overlook Platform	Bay Village	Developed Open Space/Open Water	625.1	8.1 mi.	9.7 mi.	North	8/3/2016	17:25
17	Cleveland Mall	Cleveland	Urban Core Zone	652.176	8.5 mi.	10.9 mi.	North Northwest	8/3/2016	18:43
19	Bicentennial Park	Cleveland	Urban Core Zone	584.185	8.2 mi.	10.5 mi.	Northwest	8/3/2016	19:37
25	Upper Edgewater Drive Overlook	Cleveland	Suburban Residential Zone	611.1	8.2 mi.	10.4 mi.	North	8/4/2016	10:43
28	Euclid Avenue Historic District. Key Building	Cleveland	Urban Core Zone	1168.039	8.8 mi.	11.2 mi.	North Northwest	8/4/2016	14:07
37	Lakeview Drive	Bay Village	Suburban Residential Zone/Open Water	628.1	9.3 mi.	10.4 mi.	North Northeast	8/4/2016	9:02
52	U.S. Coast Guard Cleveland Harbor Station	Cleveland	Industrial Zone	578.69	8.1 mi.	10.5 mi.	North Northwest	8/17/2016	9:11

<sup>1</sup>Feet above mean sea level



#### 4.2.2 Visual Simulations

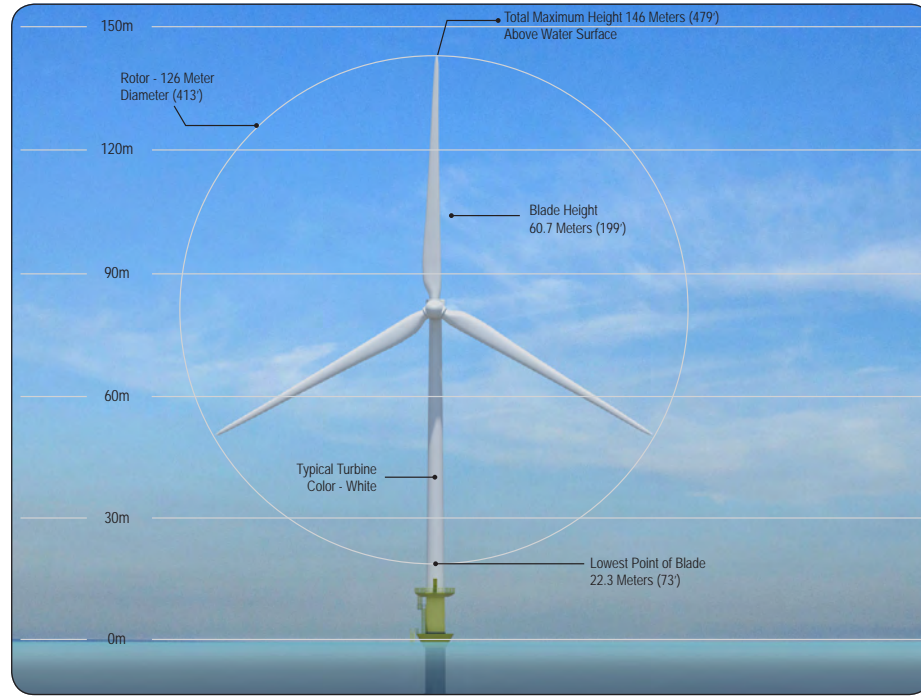
To show anticipated visual changes associated with the proposed Project, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the completed Project from each of the 13 selected viewpoints. The photographic simulations were developed by constructing a three-dimensional computer model of the proposed turbine and the six-turbine layout (using the six Primary Wind Turbine locations) based on specifications and survey coordinates provided by Icebreaker Windpower Inc. For the purposes of this analysis, it was assumed that all new turbines would be Vestas V126 3.45 MW machines. Simulation methodology is illustrated in Figure 7, and the computer model used in this VIA is shown in Figure 3.

Simulations were created by aligning each photographic viewpoint with the computer model of the proposed turbines, and superimposing the models on the photograph. This step involves utilizing aerial photographs and GPS data collected in the field to create an AutoCAD Civil 3D® drawing. The two-dimensional AutoCAD data were then imported into AutoDesk 3ds MAX® and three-dimensional components (cameras, modeled turbines, etc.) added. These data were superimposed over photographs from each of the viewpoints, and minor camera changes (height, roll, precise lens setting) made, as necessary, to align all known reference points within the view. This process ensures that Project elements are shown in proportion, perspective, and proper relation to the existing landscape elements in the view. Consequently, the alignment, elevations, dimensions, and locations of the proposed structures will be accurate and true in their relationship to other landscape features in the photo.

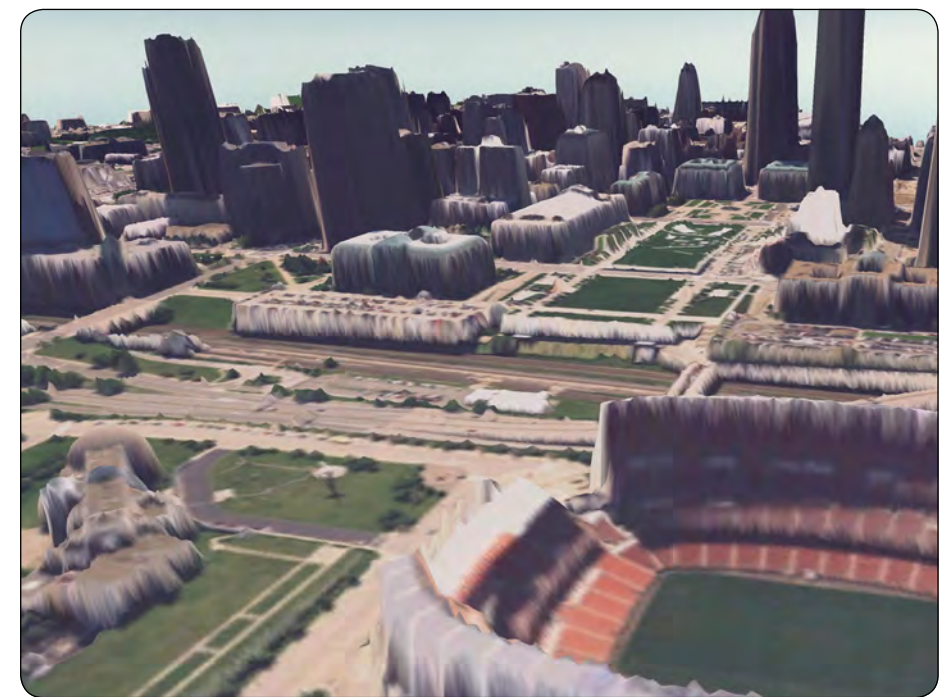
At this point, a “wire frame” model of the facility and known reference points are shown on each of the photographs. The proposed exterior color/finish of the turbines is then added to the model and the appropriate sun angle is simulated based on the specific date, time and location (latitude and longitude) at which each photo was taken. This information allows the computer to accurately illustrate highlights, shading and shadows for each individual turbine shown in the view. All simulations show the turbines with rotors oriented toward the southwest, which is generally the prevailing wind direction in the area.



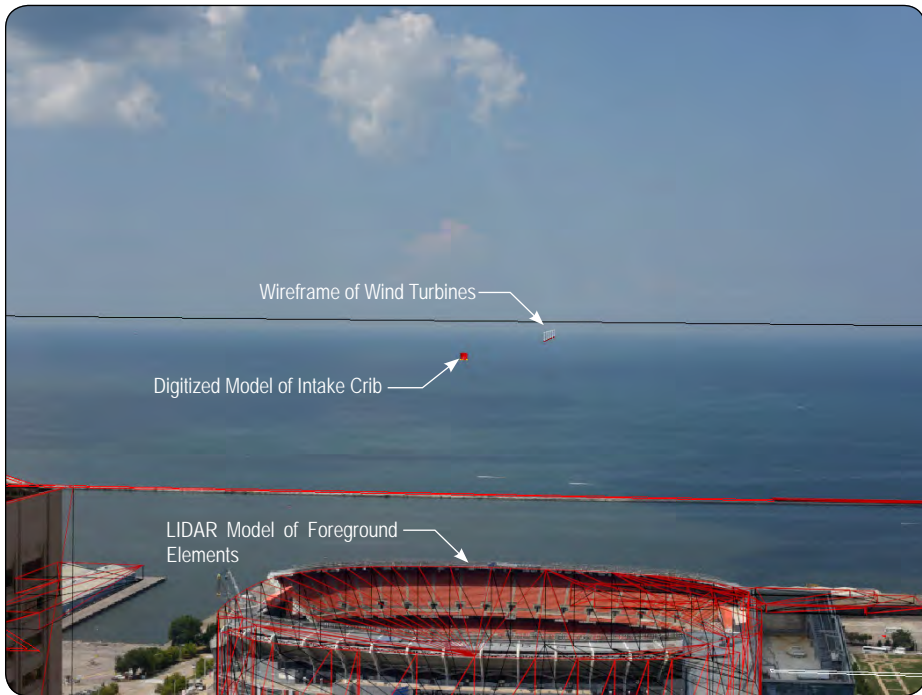
1. Photos are selected to illustrate typical views of the proposed project that will be available to representative viewer/user groups from the major landscape similarity zones and sensitive sites within the study area.



2. A three-dimensional computer model of the project is built based on proposed turbine specifications and coordinates.



3. Aerial photographs, LIDAR data, and sub-meter accuracy GPS data collected in the vicinity of the viewpoints are used to align the photo with the 3D model illustrated in image 2.



4. These data are superimposed over photographs from each of the viewpoints, and minor camera changes are made to align all known reference points within the view.



5. The distance between the viewer and the turbines is used to calculate the effects of curvature of the earth, informing screening of the model by water in the foreground.



6. The proposed exterior color/finish of the turbines is then added to the model and the appropriate sun angle is simulated based on the specific date, time and location (latitude and longitude) at which each photo was taken.

**Icebreaker Wind**

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 7: Simulation Methodology

January 2017



#### 4.2.3 Visual Impact Evaluation

To evaluate anticipated visual changes associated with the proposed Project, the photographic simulations of the completed Project (as described above) were compared to photos of existing conditions. These “before” and “after” photographs, identical in every respect except for the Project components shown in the simulated views, were prepared as 11 x 17 inch color prints, and a registered landscape architect was asked to determine the effect of the proposed Project on the existing visual conditions in terms of its contrast with existing components of the landscape. For each simulated viewpoint, the landscape architect provided a numerical score indicating the level of contrast for each view in the categories of landform, vegetation, land use, water, sky, and viewer activity. Contrast scores ranged between 0 and 4, with a score of 0 indicating no contrast, 1 indicating minimal contrast, 2 indicating moderate contrast, 3 indicating appreciable contrast, and 4 indicating strong contrast. The scores for each category (landform, vegetation, etc.) were then averaged to generate an overall contrast rating for each viewpoint. The landscape architect also provided comments on variable factors that may have affected the rating (such as atmospheric conditions or the season) as well as comments regarding the perceived effect of the Project on scenic quality and/or viewer enjoyment. As noted previously, simulations illustrate Project visibility under ideal viewing conditions (i.e., sunny and clear skies). Consequently, the visual impact evaluation was conducted under conditions that presented the highest baseline scenic quality and the highest degree of visual contrast. It therefore represents a worst case assessment of the Project’s visual impact.

## 5.0 Visual Impact Assessment Results

### 5.1 Project Visibility

#### 5.1.1 Viewshed Analysis Results

Potential turbine visibility, as indicated by the viewshed analyses, is illustrated in Figure 8 and summarized in Table 2. As indicated by the topographic blade tip analysis, the proposed Project could potentially be visible from approximately 99.0% of the 10-mile study area, and 86.5% of the landward study area, if the screening effect of existing vegetation and structures is not considered in the analysis (Figure 8, Sheet 1). This “worst case” assessment of potential visibility indicates the area where *any* portion of *any* turbine could possibly be seen without considering the screening effect of existing vegetation and structures. It also does not take into consideration other factors that affect visibility such as weather, the turbines’ narrow profile and light gray color, or the effects of distance.

Since topography within the study area generally slopes toward Lake Erie, it provides very little screening of views toward the Project. Areas where there is no possibility of seeing the Project due to intervening topography are restricted to portions of the Rocky River and Cuyahoga River valleys, much of the I-90 corridor (except in the eastern portion of the study area, where I-90 is adjacent to Lake Erie), portions of the Norfolk Southern Railroad, and a few scattered low-lying areas. Based on blade tip height and the screening effect of topography alone, only six of the identified visually sensitive resources are indicated as being fully screened from views of the proposed Project: NRHP-listed Charles Olney House and Gallery, the Tremont Designated Cleveland Landmark District, three NRHP-eligible properties, and Clark Elementary School.

Table 2. Viewshed Results Summary

Type of Viewshed	Potential Visibility			
	10-Mile Study Area		Landward Study Area	
	Square Miles <sup>1</sup>	Percent	Square Miles <sup>1</sup>	Percent
Blade Tip Visibility - Topography Only	366.4	99.0%	24.5	86.5%
FAA Warning Light Visibility - Topography Only	365.8	98.8%	23.9	84.1%
Blade Tip Visibility – Topography, Vegetation & Structures	343.6	92.8%	1.7	5.9%
FAA Warning Light Visibility – Topography, Vegetation & Structures	343.5	92.8%	1.5	5.4%

<sup>1</sup>The 10-mile radius study area is approximately 370.3 square miles in size, which includes approximately 28.4 square miles within the on-shore portion of the Study Area and 341.9 square miles within the off-shore portion of the Study Area.

---

Areas of potential nighttime visibility based on the topographic viewshed analysis (Figure 8, Sheet 2) cover approximately 98.8% of the 10-mile radius study area and 84.1% of the landward study area. These areas of potential visibility (i.e., unobstructed line of sight based on topography alone) and are indicated in roughly the same locations shown by the blade tip analysis.

Factoring structures and vegetation into the viewshed analysis does not affect the open views that will be available from Lake Erie, but it drastically reduces potential Project visibility within the landward portion of the study area, and is a more accurate reflection of what the actual extent of Project visibility is likely to be. This analysis indicates that the proposed turbines could potentially be visible during the daytime from approximately 92.8% of the 10-mile study area as a whole, but from only 5.9% of the landward study area (Figure 8, Sheet 1). Visibility within the landward study area is concentrated along the shoreline and drops off dramatically just a short distance inland due to the extensive screening provided by intervening vegetation and structures. In general, Project visibility extends further inland in the City of Cleveland and is more limited in the Cities of Lakewood, Rocky River, and Bay Village. Relatively larger areas of potential Project visibility along the shoreline occur at Lakewood Park, Edgewater Park, Whiskey Island, and Gordon Park; the East 55<sup>th</sup> Street Marina; the Port of Cleveland; and Burke Lakefront Airport. Further inland, larger areas of potential Project visibility are indicated along portions of I-90 (in the eastern portion of the study area); portions of the Norfolk Southern Corporation Railroad; along several bridges that occur within the visual study area (particularly those crossing the Cuyahoga River); portions of the Cleveland Memorial Shoreway; Kirtland Park; and areas south of the Burke Lakefront Airport, the Port of Cleveland, and the East 55<sup>th</sup> Street Marina. With respect to visually sensitive resources, this analysis indicates the Project visibility will be eliminated from over 400 of the inventoried resources, and that visibility will be reduced (partially screened) from the vast majority of the remaining resources. The only inventoried visually sensitive resources indicated as having full/unscreened views of the Project from all locations within their mapped boundary are three waterfront NRHP-listed sites: the Cleveland East and West Pierhead Lights and the U.S. Coast Guard Cleveland Harbor Station.

As with the topographic viewshed analysis results, there is a minimal difference between daytime (blade tip) and nighttime (FAA warning light) visibility with the screening effects of vegetation and structures factored into the analysis. According to this analysis, the turbine FAA warning lights will be potentially visible from 92.8% of the 10-mile study area, or 5.4% of the landward study area. Nighttime visibility is indicated in roughly the same areas as daytime visibility, but to a slightly lesser extent (Figure 8, Sheet 2).

It is important to note that the viewshed analysis results do not necessarily equate to actual Project visibility. The use of LiDAR data allows for consideration of structures and vegetation in the analysis, however, the LiDAR data is from

2006, and therefore the analysis does not reflect any changes that have occurred since that time. In addition, as mentioned previously, areas of actual visibility will be more limited than indicated by the vegetation viewshed analysis, due to the slender profile of the turbines (especially the blades, which make up the top of the turbine), their light gray color, the effects of distance, and overcast weather conditions, all of which are not considered in this analysis.



# Icebreaker Wind

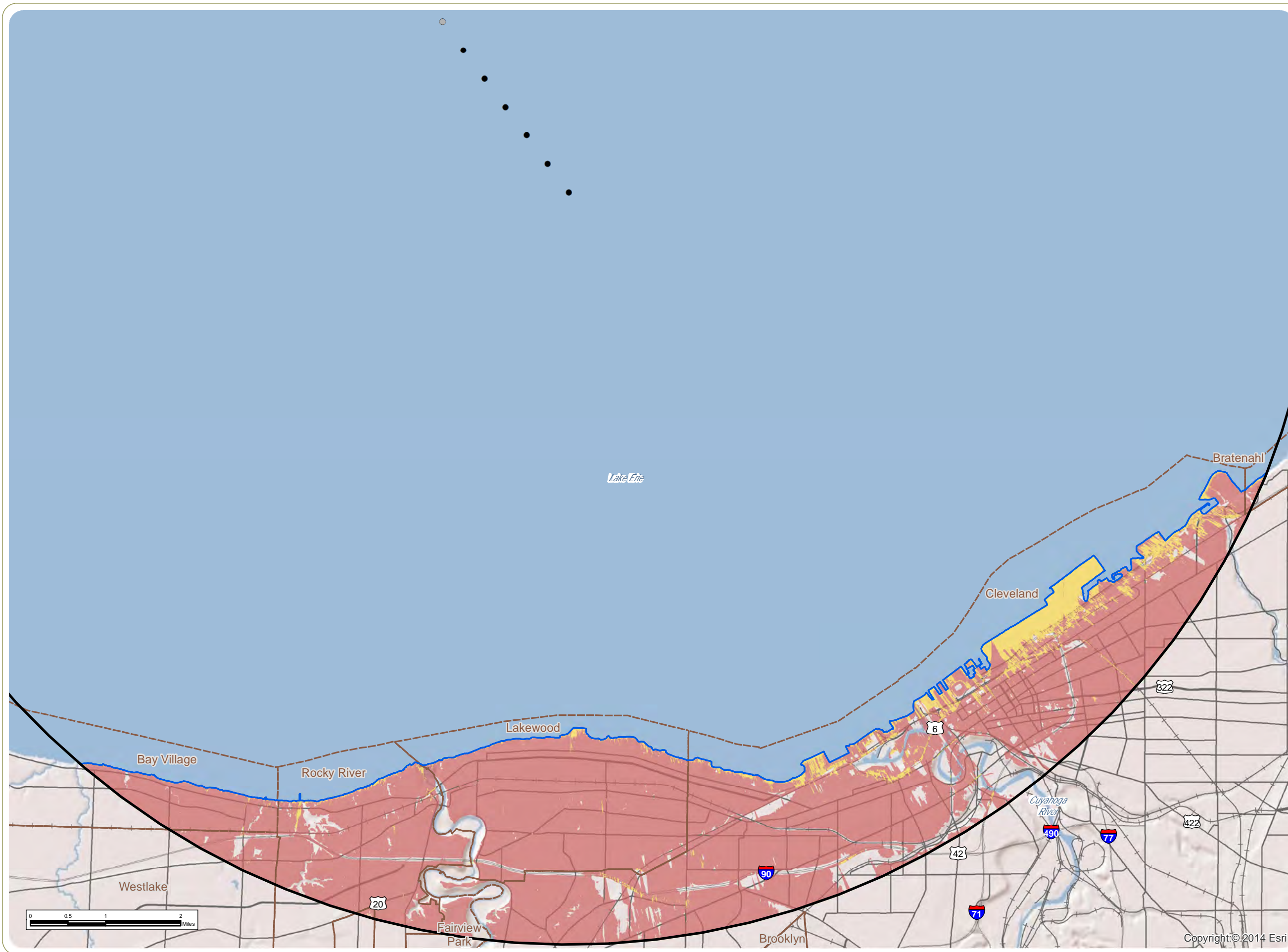
Lake Erie, City of Cleveland  
Cuyahoga County, Ohio

Figure 8: Viewshed Analysis  
Sheet 1 of 2: Blade Tip Visibility

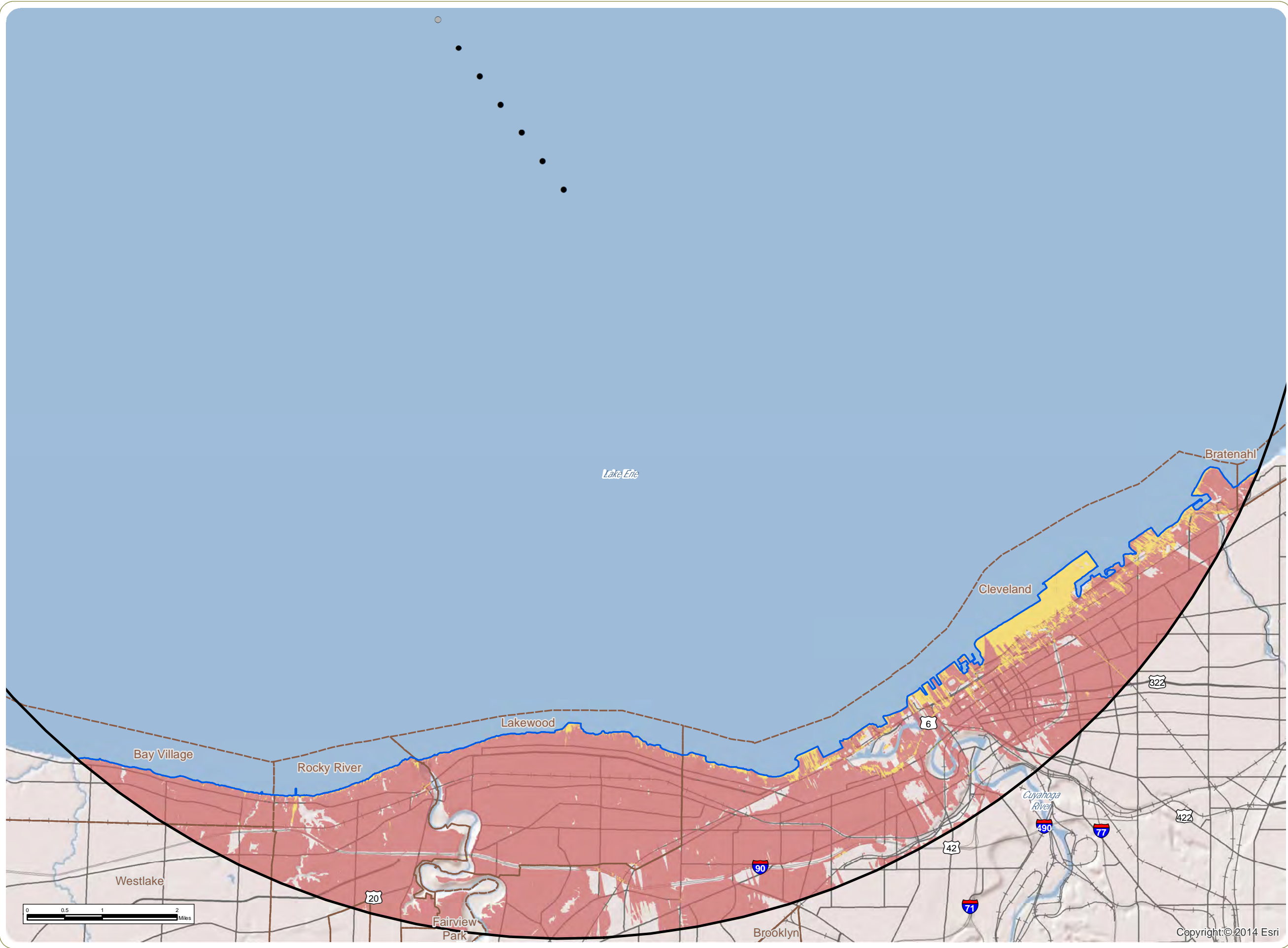
January 2017

- Primary Wind Turbine
- Alternate Wind Turbine
- Lake Erie Shoreline Dividing On-Shore and Off-Shore Study Areas
- Potential Turbine Visibility Based on Topography, Structures, and Vegetation
- Potential Turbine Visibility Based on Topography Only
- 10-Mile Visual Study Area
- City/Village Boundary

- Notes:
1. Basemap: ESRI ArcGIS Online "World Shaded Relief" Map Service.
  2. Potential turbine visibility from ground-level vantage points based on a maximum blade tip height of 479 feet.
  3. Topography, structures and vegetation derived from Ohio Statewide Imagery Program 2006 LiDAR data.
  4. Viewshed results within the on-shore study area are presented here. Views of the proposed turbines will be available throughout the off-shore study area.
  5. This is a color graphic. Reproduction in grayscale may misrepresent the data.



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### Icebreaker Wind

Lake Erie, City of Cleveland  
Cuyahoga County, Ohio

Figure 8: Viewshed Analysis  
Sheet 2 of 2: FAA Warning  
Light Visibility

January 2017

- Primary Wind Turbine
- Alternate Wind Turbine
- Lake Erie Shoreline Dividing On-Shore and Off-Shore Study Areas
- Potential FAA Warning Light Visibility Based on Topography, Structures, and Vegetation
- Potential FAA Warning Light Visibility Based on Topography Only
- 10-Mile Visual Study Area
- City/Village Boundary

- Notes:
1. Basemap: ESRI ArcGIS Online "World Shaded Relief" Map Service.
  2. Potential turbine visibility from ground-level vantage points based on an FAA warning light height of 282 feet.
  3. Topography, structures and vegetation derived from Ohio Statewide Imagery Program 2006 LiDAR data.
  4. Viewshed results within the on-shore study area are presented here. Views of the proposed turbines will be available throughout the off-shore study area.
  5. This is a color graphic. Reproduction in grayscale may misrepresent the data.



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### 5.1.2 Field Evaluation Results

Field review suggested that visibility of the Project would be largely restricted to the waterfront and open water portions of the visual study area, as suggested by the viewshed analysis. In residential areas in Westlake, Bay Village and Cleveland visibility of the Project will be fully or substantially screened from inland areas by densely situated homes and vegetation along the shoreline. In most cases, visibility does not extend beyond shoreline residences, except in circumstances where an undeveloped cul-de-sac or public ROW exists, making water views possible from public vantage points. These shoreline residences will all likely have some level of Project visibility due to the fact they have been purposely situated to take advantage of lake views. Multiple parks and developed open space along the lake shore also capitalize on open water views and therefore will have views toward the Project, but again, vegetation and structures at these sites limit unobscured off-shore views to the shoreline and immediate inland areas. In eastern Bay Village, several high-rise residential buildings are concentrated along the Lake Erie shore. These structures provide elevated views of the lake, but effectively block inland ground-level views.

Within the City of Cleveland, an abundance of waterfront facilities such as parks, marinas, and ports will generally have open views of the Project. Areas inland of the shoreline offered limited open water views due to interceding features (buildings, industrial facilities, and vegetation) along the shoreline. However, elevated portions of Interstate 90 and parks such as the City Mall will have intermittent framed views of the Project site. Additionally, many of the inland high-rise structures will have visibility of the Project from upper floors. The field crew was able to visit two high-rise buildings within the City of Cleveland (the Key Building and the Hilton Hotel) and both had expansive lake views. From the elevated vantage points, it was also apparent that many other buildings were situated in such a way that views toward the Project from the upper floors would be available. The field review confirmed a general lack of visibility from street level views within the inland portion of downtown Cleveland.

A comprehensive summary of potential Project visibility from sensitive sites within the study area is presented in Appendix A.

### 5.1.3 Other Factors Affecting Project Visibility

According to the National Weather Service (NOAA et al., 2015), the City of Cleveland has an average of 66 days per year that are clear (0-30% cloud cover), 97 days that are partly cloudy (40-70% cloud cover), and 202 days that are cloudy (80-100% cloud cover). Thus, clear skies occur approximately 18% of the time, while cloudy/overcast conditions typically occur about 55% of the time. National Weather Service data also indicate that during a typical year in Cleveland, 156 days (43%) will have precipitation of 0.01 inch or more (NOAA et al., 2015). While cloudy skies and

precipitation do not necessarily preclude Project visibility, under such conditions, long-distance views (i.e., from the City of Cleveland and adjacent shoreline areas) will be substantially reduced, and the white color of the sky and lack of strong shadows will decrease the turbines' color contrast even from closer viewpoints on the lake. No additional data on cloud ceiling height, the occurrence of fog or haze, or visibility distances were available to allow more detailed evaluation of the effects of weather on potential Project visibility. However, based on the meteorological data available, it is safe to assume that visibility of the Icebreaker Project will be obscured due to the effects of weather on over half the days of a typical year.

## **5.2 Analysis of Existing and Proposed Views**

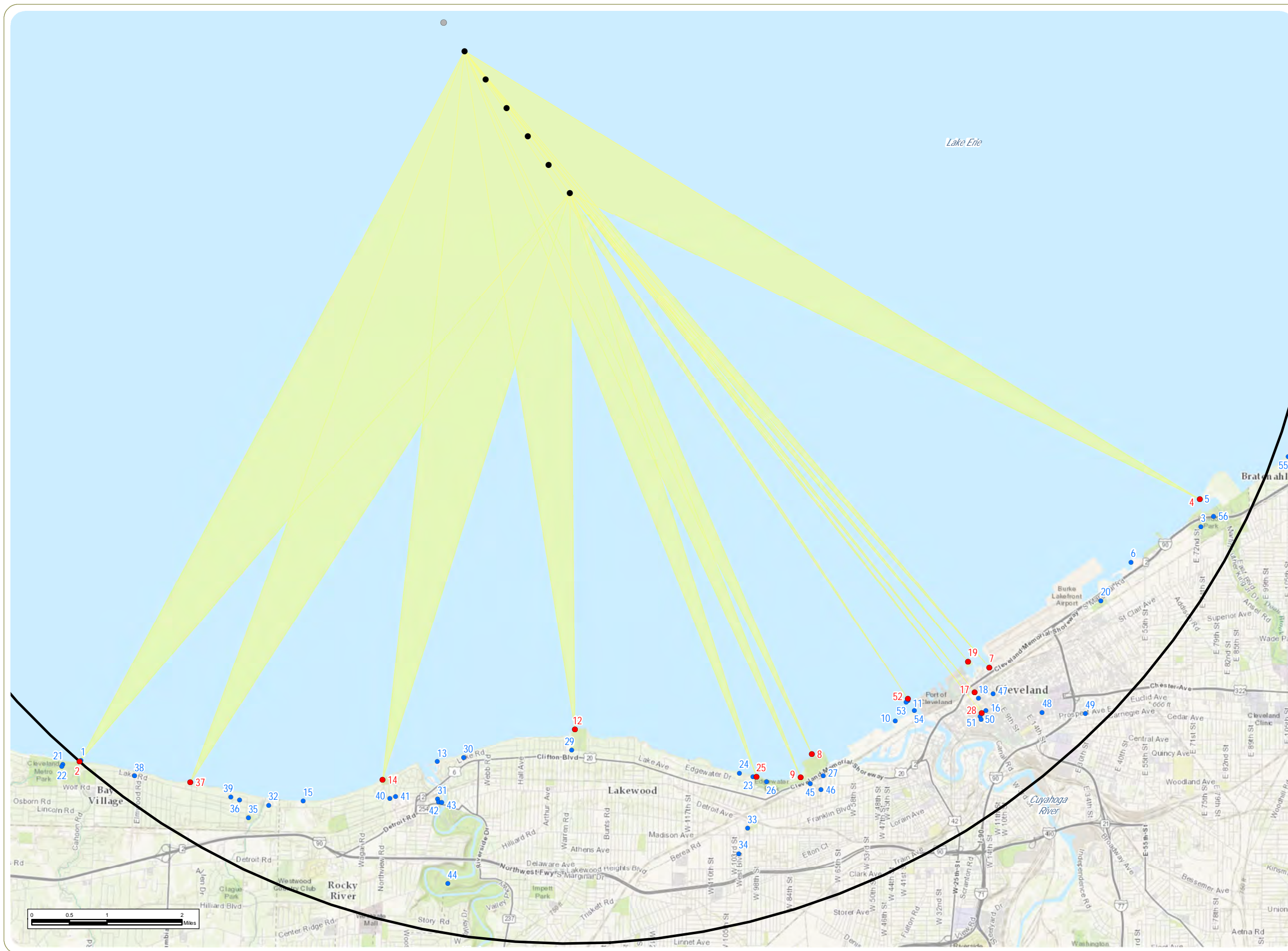
To illustrate anticipated visual changes associated with the proposed Project, photographic simulations of the completed Project from each of the 13 viewpoints indicated in Figure 9 were used to evaluate Project visibility, appearance, and contrast with the existing landscape. The viewpoints selected for development of visual simulations were broken down into five groups, based on the character of the available views and the visual context of the viewpoints. The five categories of views, with and without the proposed Icebreaker Wind Farm in place, are discussed in the following section. Review of these images, along with photos of the existing view, allowed for comparison of the aesthetic character of each view with and without the proposed Project in place. Results of this evaluation are presented below.

# Icebreaker Wind

Lake Erie, City of Cleveland  
Cuyahoga County, Ohio

Figure 9: Viewpoint Location Map

January 2017



- Primary Wind Turbine
- Alternate Wind Turbine
- Simulation Viewpoint
- Viewpoint
- Cone of View
- ▭ 10-Mile Visual Study Area

Notes:  
1. Basemap: ESRI ArcGIS Online "World Topographic Map" Map Service.  
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



### 5.2.1 Open Water Views

#### *Existing Views*

Several of the selected viewpoints feature views that essentially include nothing but open water extending from the immediate foreground to the horizon line. These types of views are represented by the existing conditions photos from viewpoints 8, 12, 14, and 37. These selected views are from the Undeveloped Open Space, Developed Open Space and Suburban Residential LSZs immediately adjacent to the shoreline, where lack of structures and trees offers unobstructed views out to Lake Erie. Several of these views are from designated overlooks, and in some cases are also representative of what boaters in near shore areas would experience as they look off-shore toward the proposed Project site. The existing views are characterized by a broad expanse of open water that is generally dark blue color, with some variability introduced by ripples, swells, and small breaking waves. With the exception of some minor foreground features around the edges, these views generally lack any man-made or natural features that would either obscure the view or serve as focal points that draw the viewer's eye to a particular location. The one exception is Viewpoint 8 from Edgewater State Park. In this view the Cleveland Water Intake Crib can be seen off-shore on the horizon line. However, at this distance, the Crib appears very small and is not a significant focal point in the view. In all of these views, the viewer's eye is carried to the horizon line where the dark blue lake meets a lighter blue sky, forming an unbroken horizontal line. The expansive nature of these views and the lack of developed features result in relatively high aesthetic quality. In addition, because these views are typical of what will be available from public park land or waterfront residences, viewer sensitivity to visual quality is assumed to be high.

#### *Proposed Views*

With the proposed Project in place, the Project's six turbines can be seen on the horizon line where the water meets the sky. The turbines appear in a straight line, but depending on their distance from the viewer and the orientation of the view, their scale and spacing are variable from viewpoint to viewpoint. The turbines are the only features extending above the horizon line, and under the cloudless blue sky conditions represented in the photos, the turbines light gray (RAL 7035) color presents clear contrast with the color of the sky. This contrast is also present when the turbines are backlit and appear dark against a lighter sky as is the case in the simulation from Viewpoint 37 (Lakeshore Drive). However, contrast would be greatly reduced (in some cases to the point where the turbines would not be visible at all) under more overcast or hazy sky conditions. The turbines' vertical line and man-made form also present contrast with the strong horizontal line of the horizon and the lack of other developed features in the view. Because of their novel, man-made form in an otherwise undeveloped view, and their unusual off-shore location, the turbines will also be a new focal point in the view. Although mitigated somewhat by their distance from the viewer, the turbines could have a

moderate to appreciable impact on scenic quality and viewer enjoyment of these types of views. It is worth noting, however, that research on public acceptance of operating wind power projects elsewhere, public reaction to the project is likely to be variable. Not all viewers see wind turbines as having an adverse visual impact. As Station (1996) notes, although a wind power project is a man-made facility, what it represents “may be seen as a positive addition” to the landscape.



## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 12:44 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Edgewater Park Bluff

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 10: Viewpoint 8, View North Northwest from Edgewater Park Bluff, Original Photograph

January 2017

Sheet 1 of 2





## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 12:44 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North Northwest

Location: Edgewater Park Bluff

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 10: Viewpoint 8, View North Northwest from Edgewater Park Bluff, Simulation

January 2017

Sheet 2 of 2





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 3:58 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North

Location: Lakewood Park (John Honam House)

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 11: Viewpoint 12, View North from Lakewood Park (John Honam House), Original Photograph

January 2017

Sheet 1 of 2





## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 3:58 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North

Location: Lakewood Park (John Honam House)

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 11: Viewpoint 12, View North from Lakewood Park (John Honam House), Simulation

January 2017

Sheet 2 of 2





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 5:25 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North

Location: Rocky River Park Overlook Platform

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 12: Viewpoint 14, View North from Rocky River Park Overlook Platform, Original Photograph

January 2017

Sheet 1 of 2





## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 5:25 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North

Location: Rocky River Park Overlook Platform

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 12: Viewpoint 14, View North from Rocky River Park Overlook Platform, Simulation

January 2017

Sheet 2 of 2





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 4, 2016

Time: 9:02 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northeast

Location: Lakeview Drive

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 13: Viewpoint 37, View North Northeast from Lakeview Drive, Original Photograph

January 2017

Sheet 1 of 2





## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 4, 2016

Time: 9:02 AM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North Northeast

Location: Lakeview Drive

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 13: Viewpoint 37, View North Northeast from Lakeview Drive, Simulation

January 2017

Sheet 2 of 2



## 5.2.2 Shoreline Views with Built Features

### *Existing Views*

Another common type of view toward the proposed Project site that is available throughout the visual study area is similar to the open water views described above, but also includes some distinct near shore built features that add a sense of development and focal points to the view. Representative examples include Viewpoints 4, 7, 25, and 52, all of which are dominated by a broad expanse of open water, but also include man-made features such as lighthouses, docks, and breakwaters that reinforce their working waterfront character and draw the viewer's attention. In some cases, such as Viewpoint 52 from the Cleveland Harbor Coast Guard Station, these features are more centrally located in the view and block significant portions of the horizon line. In others, such as Viewpoint 4 from the Cleveland Lakefront Nature Preserve, these built features are more minor, peripheral components of the view. As indicated by the examples referenced above, the settings in which such views are available are highly variable, ranging from developed harbor waterfront to undeveloped open space. However, all the selected viewpoints are in public locations where viewers gather specifically to enjoy the waterfront setting and views of the lake. Thus, viewer sensitivity to visual quality, especially in outward views toward the lake, is considered relatively high. The presence of waterfront related focal points in the view tends to add interest but decrease the undeveloped aesthetic quality of these open water views.

### *Proposed Views*

With the proposed Project in place, the proposed turbines add an additional built off-shore feature to the view. As with the previous open water views, the turbines present contrast with the color of the sky and will draw viewer attention due to their novel form and unusual location in an off-shore setting. The degree to which they become a new focal point in these views varies based on distance and orientation of the view, as well as competition for viewer attention presented by other built features. In views such as those available from Viewpoint 4 (Cleveland Nature Preserve) and Viewpoint 25 (Edgewater Drive Overlook) where the turbines appear more widely spaced and there are relatively few competing landscape features in the view, the new turbines will become a significant focal point and present moderate contrast with existing elements of the view. In others, such as Viewpoint 7 (the USS COD) and Viewpoint 52 (U.S. Coast Guard Cleveland Harbor Station) where the turbines appear more compact, and are viewed along with other existing off-shore features, they are less of a focus in the view. The presence of existing built features in a view generally reduces the contrast presented by the Project, especially when the Project is viewed at distances at excess of 8 miles, as illustrated in this group of simulations. When viewed at these distances, the turbines do not appear out of scale with other built features in the view. In addition, the limited number of turbines, their clean, delicate lines, and



their orderly arrangement do not significantly increase visual clutter, or decrease scenic quality. As with the open water views, under more overcast sky conditions, turbine visibility, color contrast, and competition as a focal point in these types of views will be further reduced.

## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 12:44 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Edgewater Park Bluff

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 10: Viewpoint 8, View North Northwest from Edgewater Park Bluff, Original Photograph

January 2017

Sheet 1 of 2





## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 12:44 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North Northwest

Location: Edgewater Park Bluff

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 10: Viewpoint 8, View North Northwest from Edgewater Park Bluff, Simulation

January 2017

Sheet 2 of 2





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 3:58 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North

Location: Lakewood Park (John Honam House)

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 11: Viewpoint 12, View North from Lakewood Park (John Honam House), Original Photograph

January 2017

Sheet 1 of 2





## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 3:58 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North

Location: Lakewood Park (John Honam House)

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 11: Viewpoint 12, View North from Lakewood Park (John Honam House), Simulation

January 2017

Sheet 2 of 2





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 5:25 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North

Location: Rocky River Park Overlook Platform

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 12: Viewpoint 14, View North from Rocky River Park Overlook Platform, Original Photograph

January 2017

Sheet 1 of 2



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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 5:25 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North

Location: Rocky River Park Overlook Platform

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 12: Viewpoint 14, View North from Rocky River Park Overlook Platform, Simulation

January 2017

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 4, 2016

Time: 9:02 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northeast

Location: Lakeview Drive

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 13: Viewpoint 37, View North Northeast from Lakeview Drive, Original Photograph

January 2017

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## Simulation



## Simulation Information

### Photograph Data

Date Taken: August 4, 2016

Time: 9:02 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northeast

Location: Lakeview Drive

### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 13: Viewpoint 37, View North Northeast from Lakeview Drive, Simulation

January 2017

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 10:28 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: Northwest

Location: Cleveland Lakefront Nature Preserve

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 14: Viewpoint 4, View Northwest from Cleveland Lakefront Nature Preserve, Original Photograph

January 2017

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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 10:28 AM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: Northwest

Location: Cleveland Lakefront Nature Preserve

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 14: Viewpoint 4, View Northwest from Cleveland Lakefront Nature Preserve, Simulation

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 12:12 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: Northwest

Location: USS COD (Submarine)

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 15: Viewpoint 7, View Northwest from USS COD (Submarine), Original Photograph

January 2017

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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 12:12 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: Northwest

Location: USS COD (Submarine)

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 15: Viewpoint 7, View Northwest from USS COD (Submarine), Simulation

January 2017





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 4, 2016

Time: 10:43 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North

Location: Upper Edgewater Drive  
Overlook

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 16: Viewpoint 25, View North from Upper Edgewater Drive Overlook, Original Photograph

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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 4, 2016

Time: 10:43 AM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North

Location: Upper Edgewater Drive  
Overlook

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 16: Viewpoint 25, View North from Upper Edgewater Drive Overlook, Simulation

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 17, 2016

Time: 9:11 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D7100

Sensor Dimensions: 35 mm

Lens Focal Length: 32.6 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: U.S. Coast Guard Cleveland Harbor Station

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 17: Viewpoint 52, View North Northwest from U.S. Coast Guard Cleveland Harbor Station, Original Photograph

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## Simulation



## Simulation Information

### Photograph Data

Date Taken: August 17, 2016

Time: 9:11 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D7100

Sensor Dimensions: 35 mm

Lens Focal Length: 32.6 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: U.S. Coast Guard Cleveland Harbor Station

### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

## Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 17: Viewpoint 52, View North Northwest from U.S. Coast Guard Cleveland Harbor Station, Simulation

January 2017

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### 5.2.3 Beach/Shoreline Recreational Views

#### *Existing Views*

A somewhat unique type of view is represented by Viewpoint 9 at the Edgewater State Park Beach. This view includes the open water of Lake Erie, but is dominated by a broad sand beach and beach-related human activity in the immediate foreground. In this type of view, the lake serves as a backdrop to the foreground features, which are the focus of viewer attention. A similar scenario would arise in other settings where recreational or residential facilities and activities occur between the viewer and the lake. In the view from Viewpoint 9, some off-shore built features, including the Crib and a stone break water, are visible in the lake, but do not really act as focal points due to the competing elements on the beach in the foreground. As in most relatively open off-shore views, the intersection of the lake and the sky forms a strong horizontal line that spans the view. In this particular view, the distinct shoreline where the lake meets the edge of the beach, and the lack of any tall landscape features, reinforces the strong horizontal lines in the view. Aesthetic quality of this view is relatively high, and the state park setting and recreational use suggest that visitor sensitivity to visual change may also be high.

#### *Proposed Views*

With the proposed Project in place, six turbines are visible on the horizon line on the left side of the view. As in previous simulations, the turbines light gray color contrast with the blue sky in the background, but their prominence is limited due to the effects of distance. In this view, the human activity on the beach remains the focus of viewer attention. However, the turbines will serve as a focal point for beach-goers when looking out to the lake. Somewhat like the crib, which is also visible in this view, their location in a lake setting, their novel form, and the lack of other interesting off-shore features, will draw the attention of beach-goers. They could be perceived as having a moderate impact on scenic quality, but as mentioned previously, may be considered a positive addition to the landscape by some viewers. Regardless of their perceived effect on scenic quality, the turbines should not affect viewer participation in, or enjoyment of, beach activities.

## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 1:13 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Edgewater Park Beach

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 18: Viewpoint 9, View North Northwest from Edgewater Park Beach, Original Photograph

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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 1:13 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North Northwest

Location: Edgewater Park Beach

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop

CC: Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 18: Viewpoint 9, View North Northwest from Edgewater Park Beach, Simulation

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#### 5.2.4 Developed Shoreline Views

##### *Existing Views*

Because the Lake Erie shoreline within the visual study area includes an abundance of developed land (urban, suburban, industrial), a typical view out to the lake often includes some level of shoreline development in the immediate foreground. Examples of this type of view are provided by Viewpoints 2 and 19. Both of these are from shoreline park settings, but represent the type of views that are available at a variety of public vantage points in developed open space settings. In some of these views, such as Viewpoint 2 from the Cahoon Memorial Park Boat Launch, the developed features are restricted to the immediate foreground (in this case a dock structure) with nothing but the open water of Lake Erie in the mid-ground and background. In other instances, such as Viewpoint 19 from Bicentennial Park near the Rock and Roll Hall of Fame, the views include developed features not only at the water's edge, but also in the lake in the mid-ground or background (in this case a stone break water and the crib). Prominent developed features in the foreground of these views are focal points in the views and provide evidence of the broader developed landscape context of these viewpoints. Visual quality and viewer sensitivity to visual change in such settings will be variable, but in most parks and other public venues, will likely be at least moderate.

##### *Proposed Views*

From developed shoreline settings, such as Viewpoint 2 and 19, the proposed Project will add a relatively minor new developed feature to the existing views. Despite the fact that the turbines are very large structures, at the 7.5 to 11.5 mile distance at which they are being viewed in these simulations, they appear relatively small compared to the other developed features along the shoreline and in the near shore area. The turbines will interrupt the skyline and are unexpected in an off-shore setting. As these simulations illustrate, the extent of the view occupied by the Project, and the prominence of the turbines, will vary based on distance, orientation of the view, and sun/sky conditions. In Viewpoint 2 from the Cahoon Memorial Park Boat Launch, the turbines appear widely spaced and occupy approximately a third of the visible horizon line in the selected photo. However, at the time of day that the photo was taken, and under the sky conditions at the time, the contrast of the turbines against the sky is relatively low. Conversely, in the simulation from Viewpoint 19 at Bicentennial Park, the contrast presented by the backlit turbines is substantially greater, but the orientation of the view makes the Project appear much more compact. Under both scenarios, the turbines would be a focal point in the view, but would also compete with other on shore and off-shore features for viewer attention. Because they are viewed in the context of other developed features, their land use contrast and effect on scenic quality are minimal. Due their distant off-shore setting, and the presence of competing features and activities



occurring along the developed shoreline, the presence of the turbines should not adversely affect viewer activity or enjoyment of the view.

## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 8:25 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: Northeast

Location: Cahoon Memorial Park Boat Launch

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 19: Viewpoint 2, View Northeast from Cahoon Memorial Park Boat Launch, Original Photograph

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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 8:25 AM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: Northeast

Location: Cahoon Memorial Park Boat Launch

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 19: Viewpoint 2, View Northeast from Cahoon Memorial Park Boat Launch, Simulation

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 7:37 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: Northwest

Location: Bicentennial Park

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 20: Viewpoint 19, View Northwest from Bicentennial Park, Original Photograph

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## Simulation



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 7:37 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: Northwest

Location: Bicentennial Park

### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 20: Viewpoint 19, View Northwest from Bicentennial Park, Simulation

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### 5.2.5 Elevated City Views

#### *Existing Views*

A somewhat unique type of view that is available within the visual study area is an elevated view of the lake available from within the City of Cleveland. These types of views are exemplified by Viewpoint 17 from the Cleveland Mall, and Viewpoint 28 from the 28<sup>th</sup> floor of the Key Building. Unlike ground-level views toward the lake within the city, which are generally fully or substantially screened by intervening structures, these elevated vantage points allow for views over foreground development out to the open water of the lake. These foreground features will vary widely depending on the specific location of the given viewpoint. In both selected views, a variety of structures are visible including First Energy Stadium, the Port of Cleveland, and the Great Lakes Science Center. From other viewpoints, different commercial, residential, institutional, and industrial structures would be visible in the foreground of such views.

The dominance of the lake in these views is largely related to viewer height. At the Cleveland Mall, a viewer is approximately 83 feet above lake level, and the lake is viewed as a mid-ground and background feature between and above developed foreground features that dominate the view. From the 28<sup>th</sup> floor of the Key Building the viewer is approximately 599 feet above lake level. At this height, foreground features are relegated to the lower portion of the view, and a broad expansive open water is visible to the horizon. In such higher elevation views, the lake itself becomes the focal point, and the character defining element of the view. Regardless of viewer height, these elevated city views include a variety of buildings and man-made structures that define the landscape context as an urban setting. Even if the developed features in the view do not contribute to the overall aesthetic value, the presence of the lake in these views enhances scenic quality and adds interest. Viewer sensitivity will be highly variable based on the activity in which the viewers are engaged and the aesthetic quality of other developed features in the view.

#### *Proposed Views*

In elevated city views, with the proposed Project in place, the turbines may or may not be clearly visible, as shown in the simulations from Viewpoints 17 and 28. Under clear sky conditions and strong sunshine, as illustrated in the view from Viewpoint 17 at the Cleveland Mall, the turbines are clearly visible on the horizon line. However, in this view, with an abundance of built features in the foreground (including a wind turbine) the Project does not present significant contrast in terms of line, form, color, or existing land use. The distance of the turbines from the viewer, minimizes scale contrast, and the limited extent of open uninterrupted horizon visible from this viewpoint reduces the prominence of the turbines. In the view from Viewpoint 28, on the 28<sup>th</sup> floor of the Key Building, less development is visible in the



foreground and a much larger expanse of open water and horizon line are visible. However, any resulting increase in Project contrast that might result from this is off-set by the decreased turbine visibility and contrast with the background under the sky conditions illustrated in this photo. Despite relatively clear skies, haze at the horizon largely obscures the proposed turbines. Their visibility and contrast would be even less under overcast conditions. Regardless of weather conditions, Project-related impacts on scenic quality and viewer activity in elevated city settings are likely to be minimal.

## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 6:43 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Cleveland Mall

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 21: Viewpoint 17, View North Northwest from Cleveland Mall, Original Photograph

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## Simulation



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 6:43 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Cleveland Mall

### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop

CC: Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 21: Viewpoint 17, View North Northwest from Cleveland Mall, Simulation

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 4, 2016

Time: 2:07 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Euclid Avenue Historic District. Elevated View from Key Building

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 22: Viewpoint 28, View North Northwest from Euclid Avenue Historic District. Elevated View from Key Building, Original Photograph

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## Simulation



## Simulation Information

### Photograph Data

Date Taken: August 4, 2016

Time: 2:07 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Euclid Avenue Historic District. Elevated View from Key Building

### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

## Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 22: Viewpoint 28, View North Northwest from Euclid Avenue Historic District. Elevated View from Key Building, Simulation

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Evaluation of the simulations of the proposed Project by an EDR landscape architect indicated that the overall degree of Project contrast and potential impact on scenic quality under worst case conditions (i.e., sunny clear skies) is variable, and largely dependent on the orientation of the view, and the presence or lack of other developed features in the view. Of the 13 simulations evaluated, two simulations had an average contrast rating greater than 3.0 (appreciable) on a scale of 0 (insignificant) to 4 (strong). Five viewpoints received scores indicating a moderate visual contrast (range of 1.9 to 2.5), while the remaining six views had an average contrast rating of less than 1.3, indicating a minor to insignificant impact (see Table 3).

**Table 3. Visual Simulations Contrast Rating Summary**

Viewpoint Number	Nearest Turbine	Scenic Quality <sup>2</sup>	Contrast Rating <sup>1</sup>						
			Landform	Vegetation	Land Use	Water	Sky	Viewer Activity	Average
2	10 mi.	H	N/A	N/A	2	2	2	1.5	1.9
4	9.3 mi.	H	N/A	0	3	1.5	2.5	2	2.25
7	8.4 mi.	M	0.5	N/A	0.5	0.5	1	0	0.5
8	8.1 mi.	H	N/A	N/A	2.5	2.5	2.5	2.5	2.5
9	8.4 mi.	H	1	N/A	2	1	1.5	1	1.3
12	7.1 mi.	H	N/A	N/A	3.5	2.5	3.5	3.5	3.25
14	8.1 mi.	H	N/A	N/A	3	2.5	3.5	3.5	3.1
17	8.5 mi.	M	0.5	0	0	3	2	1	1.1
19	8.2 mi.	H	0	N/A	0.5	0.5	1.5	1	0.7
25	8.2 mi.	H	N/A	N/A	2.5	2.	2	2.5	2.25
28	8.8 mi.	H	0	N/A	0	0	0	0	0
37	9.3 mi.	H	N/A	0	2.5	2.5	3.5	3.5	2.4
52	8.1 mi.	H	0	N/A	0	0.5	0.5	0	0.2
<b>Average</b>			0.33	0	1.7	1.6	2.0	1.7	1.65

<sup>1</sup> Contrast ratings scale: 0 (insignificant), 1 (minimal), 2 (moderate), 3 (appreciable), and 4 (strong).

<sup>2</sup> H=High, M=Moderate, L=Low, as judged by the landscape architect, based on the photo from each viewpoint.

All of the highest contrast ratings (range = 2.4-3.25, average = 2.8) were received by viewpoints that represented Open Water views with essentially no evidence of human development (i.e., Viewpoints 8, 12, 14 and 37). The unbroken expansiveness of these views, the lack of developed features, and the potential sensitivity of viewers in these park and residential settings resulted in relatively high contrast scores, particularly in terms of the Project's contrast with the water, sky, land use and viewer activity. However, this degree of contrast would diminish significantly under the cloudy and partly cloudy sky conditions that occur on 82% of the days in a typical year. In addition, in the case of wind turbines, high visibility and appreciable contrast with the existing landscape do not necessarily equate to an adverse visual impact for many viewers.

Other views in a recreational setting that included relatively few developed features, such as Viewpoints 2, 4 and 26 received the next highest average contrast scores (range = 1.9 – 2.25, average = 2.1) indicating a moderate visual impact.



At the other end of the scale, those viewpoints that received overall contrast scores indicating a minimal to insignificant visual impact (range = 0 – 1.3, average = 0.6) were generally characterized by substantial existing developed features off-shore and/or along the shoreline. These features, along with site-specific conditions such as viewer orientation and lighting/sky conditions, tended to reduce the Project's visual contrast with the existing landscape and its potential impact on scenic quality and viewer activity.

As noticed previously, wind turbines are unlike most other energy/infrastructure facilities, such as transmission lines or conventional power plants, which are almost universally viewed as aesthetic liabilities. Wind turbines have a clean sculptural form that is considered attractive by some viewers (Pasqualetti et al., 2002). Operating wind power projects in a variety of settings have been documented as receiving a generally positive public reaction following their construction. For instance, a survey conducted in Lewis County, New York (location of the 195-turbine Maple Ridge Wind Power Project in operation since 2006) revealed that a majority of residents surveyed indicated that wind farms have had a positive impact on Lewis County (70.7% of participants), and that wind farms should be expanded in the county (79.2% of participants). The survey further characterized the individuals that were able to see and/or hear turbines from their homes to reveal that 77.1% of these individuals indicated that the wind farms have had a positive impact on Lewis County. Additionally, only 7.5% of participants who lived within 1 mile of the nearest wind turbine felt that wind farms have had a negative impact (Jefferson County Community College, 2008).

These results are consistent with the results of a study of public perception of wind power in Scotland and Ireland (Warren et. al., 2005), which concluded the following:

*"A remarkably consistent picture is emerging from surveys of public attitudes to wind power, and the case studies provide further evidence that this picture is a representative one. Large majorities of people are strongly in favour of their local windfarm, their personal experience having engendered positive attitudes. Moreover, although some of those living near proposed windfarm sites are less convinced of their merits, large majorities nevertheless favour their construction. This stands in marked contrast with the impression conveyed in much media coverage, which typically portrays massive grassroots opposition to windfarms."*

### 5.3 Nighttime Impacts

Nighttime photos from the Block Island (Rhode Island) Wind Farm (Figure 25), illustrate the type of nighttime visual impact that could occur from viewpoints along the Lake Erie shoreline due to the turbines' U.S. Coast Guard navigation warning lights and FAA aviation warning lights. As shown in these photos, the contrast of the warning lights with the night sky can be strong in dark, shoreline settings, under clear viewing conditions. Viewer attention is drawn by the

flashing of the lights, and any positive reaction that wind turbines engender (due to their graceful form, association with clean energy, etc.) is lost at night. While generally not disturbing (or even strongly perceptible) from roads and public viewpoints that are visited primarily during the daytime, turbine lighting may be perceived negatively by shoreline residents who can view these lights from their homes and yards. However, it is worth noting that in many places nighttime visibility/visual impact will be limited due to 1) the abundance of buildings and trees that screen the Project from the majority of homes within the study area, 2) existing shoreline and offshore light sources that already impact nighttime lake views, 3) distance of the Project from shoreline viewpoints, and 4) the concentration of residences in cities and neighborhoods, or along highways, where existing lights already compromise dark skies and compete for viewer attention. In addition, as with daytime views, overcast conditions, which occur on the majority of days throughout the year, will limit the visibility of aviation and navigation warning lights located 8 to 10 miles offshore.





Representative Nighttime View of the Block Island Wind Farm (16 Miles Distant)



Representative Nighttime View of the Block Island Wind Farm (36 Miles Distant)



Enlarged Image of Block Island FAA Warning Lights on the Horizon

**Icebreaker Wind**

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Figure 23: Representative Evening/Nighttime Photos

January 2017

Note: Images in this figure are not from the Icebreaker Wind Project



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## 6.0 Conclusions

The VIA for the Icebreaker Wind Farm allows the following conclusions to be drawn:

1. Viewshed mapping, taking into consideration the screening provided by buildings and trees, indicate that views of the Project should have the potential to be available from only 5.9% of the on-shore portion of the 10-mile radius visual study area (i.e., 94.1% of the landward study area will be screened from view of the Project). Potential Project visibility is largely restricted to open land on, and immediately adjacent to, the Lake Erie shoreline. The most substantial area of potential visibility indicated by the viewshed analysis is the Burke Lakefront Airport in the City of Cleveland. A majority of the sensitive sites identified within the study area (400) are indicated as being screened from view by the viewshed analysis.
2. Field review confirmed that Project visibility will be generally limited to the Lake Erie shoreline. Typically, lakefront development, including houses, commercial buildings, parks, and industrial operations that utilize the shoreline to capitalize on lake views, or commerce associated with the shipping industry, block views from locations further inland. There are multiple opportunities for views of the lake, and the Project, along the shoreline within the study area, including parks, beaches, marinas, etc.
3. Simulations of the proposed Project under ideal viewing conditions indicate that the visibility and visual impact of the wind turbines will be highly variable, based primarily on the presence of other man-made features in the view, and sensitivity of the viewpoints and viewers in question. However, the Project's distance from shoreline viewpoints substantially mitigates this impact. The closest point to shore from the turbines is 7.1 miles and is represented in the view from Lakewood Park (see Figure 11). Even at this closest distance, the Project will occupy a relatively small portion of an expansive lakeward view, and thus will not dominate the horizon. Studies have shown that significant visual effects of wind power projects are generally concentrated within 3.5 miles (6 kilometers) of the Project site (Eyre, 1995).
4. Evaluation by a licensed EDR landscape architect indicates that the Project's overall contrast with the visual/aesthetic character of the area will range from insignificant to appreciable. Insignificant to moderate contrast was noted for viewpoints that included existing developed shoreline and off-shore features. Moderate to appreciable contrast was noted where existing developed features were lacking in views of Lake Erie and at viewpoints in shoreline park and residential settings where the expansive open view of the lake is an important part of the viewer experience. However, the degree of Project visibility and contrast with the existing landscape



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will be substantially reduced under cloudy and partly cloudy conditions that occur on 82% of the days during a typical year in Cleveland. In addition, even where the Project's contrast with existing landscape features and viewer expectations is high, based on experience with currently operating wind power projects elsewhere, public reaction to the Project is likely to be generally positive. As Stanton (1996) notes, although a wind power project is a man-made facility, what it represents "may be seen as a positive addition" to the landscape.

5. Based upon the nighttime photos/observations of existing wind power projects, the red flashing lights on the turbines could result in a nighttime visual impact on certain viewers. The actual significance of this impact from a given viewpoint will depend on weather conditions, what other sources of lighting are present in the view, the extent of screening provided by structures and trees, and nighttime viewer activity/sensitivity. However, on clear nights in dark settings, night lighting could be somewhat distracting and have an adverse effect on residents that currently experience dark nighttime views of Lake Erie.
6. Mitigation options are limited, given the nature of the Project and its siting criteria (tall structures typically located in open fields). However, various mitigation measures were considered. These included the following:
  - A. Screening. Because most of the views that will be affected by the proposed Project are designated or designed to provide open views of Lake Erie, screening to block views of the turbines would likely have a greater adverse visual impact than the turbines themselves. In addition, these viewpoints are widespread, and providing screening along significant portions of the shoreline is not practical. However, if adequate natural screening is lacking at the proposed Project Substation site, a screening or planting plan could be developed and implemented to minimize the visibility of this component of the proposed Project.
  - B. Relocation. The proposed turbines are located in excess of 7 miles from the nearest shoreline location within the visual study area. This distance was noted as an important factor in limiting the Project's visual impact. The specific location of the turbines also correlates with certain wind conditions, water depths, substrate conditions, shipping lanes and other siting considerations that essentially preclude significant relocation of the proposed turbines.
  - C. Camouflage. The light gray color of the wind turbines (as mandated by the FAA to eliminate the need for day time lighting) minimizes contrast with the sky under most conditions, especially when viewed at distance against the horizon and under overcast conditions. Consequently, this color is proposed to be utilized on the Icebreaker Project. The form and movement of the turbines prevents more extensive camouflage from being

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a viable mitigation alternative (i.e., they cannot be made to look like anything else). Neilson (1996) notes that efforts to camouflage or hide wind farms generally fail, while Stanton (1996) feels that such efforts are inappropriate. She believes that wind turbine siting "is about honestly portraying a form in direct relation to its function and our culture; by compromising this relationship, a negative image of attempted camouflage can occur."

- D. **Low Profile.** A significant reduction in turbine height is not possible without significantly decreasing power generation. To off-set this decrease, additional turbines would be necessary. Along with substantially increasing costs, a higher number of shorter turbines would not necessarily decrease Project visual impact. In fact, several studies have concluded that people tend to prefer fewer larger turbines to a greater number of smaller ones (Thayer and Freeman, 1987; van de Wardt and Staats, 1988). In addition, at the distance the turbines are being viewed from shoreline locations, a modest decrease in height is unlikely to have a noticeable effect on Project visibility and visual impact.
- E. **Nonspecular/Non-reflective Materials.** Where possible, non-reflective paints and finishes will be used on the wind turbines to minimize reflected glare. Where this is not feasible, natural weathering/dulling of any glossy surfaces (on turbine or substation components) will typically occur within one year following installation.
- F. **Lighting.** Turbine lighting will be kept to the minimum allowable by the FAA and U.S. Coast Guard. FAA obstruction warning lights will be medium intensity red strobes that only operate at night. More obtrusive white strobes or steady burning red lights will not be used, so as to minimize potential impacts to birds and visual impacts. Lighting at the proposed substation should be kept to the minimum necessary to assure facility safety and security.
- G. **Maintenance.** The turbines will be maintained to ensure that they are operating efficiently. Research and anecdotal reports indicate that viewers find wind turbines more appealing when the rotors are turning (Stanton, 1996, Pasqualetti et al., 2002). In addition, Icebreaker Windpower Inc. will establish financial assurance to ensure that if the Project goes out of service and is not repowered/redeveloped, the facility will be decommissioned in accordance with an approved decommissioning plan.
- H. **Offsets.** Correction of an existing aesthetic problem within the viewshed is a viable mitigation strategy for wind power projects that result in significant adverse visual impact. However, given the results of this study,



off-sets such as removal of existing blighted/derelict structures, or restoration and maintenance of neglected cultural resources, would not be necessary to address the visual impact of the proposed Project.

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## **Appendix A**

Sensitive Site Table

Visually Sensitive Resource	Location			Distance <sup>2</sup> Miles from Nearest Turbine	Distance Zone ● Foreground ● Midground ● Background	Project Visibility		
	City or Village	County	VP Number <sup>1</sup>			+ Visible	- Not Visible	+/- Partially Visible
					Topographic Viewshed	DSM Viewshed	Field Review	
<b>Properties and Districts listed in the National or State Register of Historic Places</b>								
Honam, John, House	City of Lakewood	Cuyahoga	29	7.2	.	+/-	+/-	-
Clifton Park Lakefront District	City of Lakewood	Cuyahoga	13, 30	7.4	.	+/-	+/-	+/-
Cleveland West Pierhead Light	City of Cleveland	Cuyahoga		7.6	.	+	+	
Cleveland East Pierhead Light	City of Cleveland	Cuyahoga		7.6	.	+	+	
Westerly Apartments	City of Lakewood	Cuyahoga		7.9	.	+	-	
Detroit-Warren Building	City of Lakewood	Cuyahoga		8.0	.	+	-	
Nicholson, James, House	City of Lakewood	Cuyahoga		8.0	.	+	-	
Cleveland Harbor Station, U.S. Coast Guard	City of Cleveland	Cuyahoga	11, 53	8.1	.	+	+	+
Westlake Hotel	City of Rocky River	Cuyahoga	31, 42, 43	8.2	.	+/-	-	-
USS COD (submarine)	City of Cleveland	Cuyahoga	7	8.2	.	+/-	+/-	+
Hackenberg, Harvey, House	City of Lakewood	Cuyahoga		8.4	.	+	-	
Cleveland Warehouse District (+Boundary Increase)	City of Cleveland	Cuyahoga		8.5	.	+/-	+/-	
Erie Railroad Cleveland Powerhouse	City of Cleveland	Cuyahoga		8.5	.	+/-	+/-	
Globe Machine and Stamping Company	City of Cleveland	Cuyahoga		8.5	.	+	-	
Cleveland Mall	City of Cleveland	Cuyahoga	16, 17, 18, 28	8.5	.	+/-	+/-	+/-
Birdtown Historic District	City of Lakewood	Cuyahoga		8.6	.	+/-	-	
Old River Road Historic District	City of Cleveland	Cuyahoga		8.6	.	+/-	-	
White Chewing Gum Company Building	City of Cleveland	Cuyahoga		8.6	.	+/-	-	
Root and McBride-Bradley Building	City of Cleveland	Cuyahoga		8.6	.	+	-	
Oppmann Terrace	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
Bingham Company Warehouse	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
Globe Iron Works Building	City of Cleveland	Cuyahoga		8.7	.	+	-	
Liquid Carbonic Corporation Dry Ice Plant	City of Cleveland	Cuyahoga		8.7	.	+	-	
Upson-Walton Company Building	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
Day, Erastus, House	City of Lakewood	Cuyahoga		8.7	.	+	-	
Hoyt Block	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
Woodland Avenue and West Side Railroad Powerhouse	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
Kundtz, Theodor, Company Building	City of Cleveland	Cuyahoga		8.7	.	+	-	
Division Avenue Pumping Station	City of Cleveland	Cuyahoga		8.7	.	+/-	+/-	
Euclid Avenue Historic District	City of Cleveland	Cuyahoga	16, 28, 48, 50, 51	8.8	.	+/-	+/-	+/-
Gordon Square Historic District	City of Cleveland	Cuyahoga		8.8	.	+	+/-	
Gordon Square Building	City of Cleveland	Cuyahoga		8.8	.	+	-	
Neal Terrace	City of Cleveland	Cuyahoga		8.8	.	+	+/-	
Old Stone Church	City of Cleveland	Cuyahoga		8.8	.	+	-	
Cleveland Centre Historic District	City of Cleveland	Cuyahoga		8.8	.	+/-	+/-	
Templin-Bradley Company	City of Cleveland	Cuyahoga		8.8	.	+	-	
McKinley Terrace	City of Cleveland	Cuyahoga		8.8	.	+	+/-	
Superior Avenue Viaduct	City of Cleveland	Cuyahoga		8.8	.	+/-	-	
Harp Apartments	City of Cleveland	Cuyahoga		8.8	.	+	-	
Franklin Boulevard--West Clinton Avenue Historic District (+ Boundary Increase)	City of Cleveland	Cuyahoga		8.8	.	+	+/-	
Watterson School	City of Cleveland	Cuyahoga		8.8	.	+	-	
Rockefeller Building	City of Cleveland	Cuyahoga		8.8	.	+	-	
East Ohio Gas Company Building	City of Cleveland	Cuyahoga		8.8	.	+	-	
Kennedy Apartments and Commercial Block	City of Cleveland	Cuyahoga		8.8	.	+	-	
Western Reserve Building	City of Cleveland	Cuyahoga		8.9	.	+/-	-	
Cleveland Public Square	City of Cleveland	Cuyahoga	50, 51	8.9	.	+	-	-
Society for Savings Building	City of Cleveland	Cuyahoga	51	8.9	.	+	-	-
Perry-Payne Building	City of Cleveland	Cuyahoga		8.9	.	+	-	
Old Federal Building and Post Office	City of Cleveland	Cuyahoga		8.9	.	+/-	-	
Hubbard Cooke Block	City of Cleveland	Cuyahoga		8.9	.	+	-	



Visually Sensitive Resource	Location		VP Number <sup>1</sup>	Distance <sup>2</sup> Miles from Nearest Turbine	Distance Zone ● Foreground ● Midground ● Background	Project Visibility		
	City or Village	County				+ Visible	- Not Visible	+/- Partially Visible
						Topographic Viewshed	DSM Viewshed	Field Review
Federal Reserve Bank Of Cleveland	City of Cleveland	Cuyahoga		8.9	.	+	-	
Courtland, The	City of Cleveland	Cuyahoga		8.9	.	+	-	
Detroit-Superior High Level Bridge	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
Cleveland Discount Building	City of Cleveland	Cuyahoga		8.9	.	+	-	
Federal Knitting Mills (+ Boundary Increase)	City of Cleveland	Cuyahoga		8.9	.	+	+/-	
Bryant Building	City of Cleveland	Cuyahoga		8.9	.	+/-	-	
Union Terminal	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
Van Rooy Coffee Company Building	City of Cleveland	Cuyahoga		8.9	.	+	-	
Universal Terminal Company Dock and Warehouse	City of Cleveland	Cuyahoga	6	8.9	.	+	+/-	+
Cleveland Arcade	City of Cleveland	Cuyahoga		8.9	.	+/-	-	
East Ohio Building	City of Cleveland	Cuyahoga		9.0	.	+	-	
Superior Avenue Historic District	City of Cleveland	Cuyahoga		9.0	.	+	+/-	
Vitrolite Building	City of Cleveland	Cuyahoga		9.0	.	+	-	
Forest City Bank Building	City of Cleveland	Cuyahoga		9.0	.	+	-	
West 25th Street - Detroit Avenue Historic District	City of Cleveland	Cuyahoga		9.0	.	+/-	-	
Park Building	City of Cleveland	Cuyahoga		9.0	.	+	-	
May Company	City of Cleveland	Cuyahoga		9.0	.	+	-	
Ohio City Preservation District (+ Boundary Increase)	City of Cleveland	Cuyahoga		9.0	.	+/-	-	
St John's Episcopal Church	City of Cleveland	Cuyahoga		9.0	.	+/-	-	
Franklin Boulevard Historic District	City of Cleveland	Cuyahoga		9.0	.	+	-	
New England Building	City of Cleveland	Cuyahoga		9.0	.	+	-	
East Fourth Street Historic District	City of Cleveland	Cuyahoga		9.0	.	+	-	
Lerner Building	City of Cleveland	Cuyahoga		9.0	.	+	-	
Clinton Apartments	City of Cleveland	Cuyahoga		9.0	.	+	-	
Black, H, and Company Building	City of Cleveland	Cuyahoga		9.0	.	+	-	
Tiedemann, Hannes, House	City of Cleveland	Cuyahoga		9.0	.	+	-	
Colonial and Euclid Arcades	City of Cleveland	Cuyahoga		9.0	.	+/-	-	
Krause Building - Otto Moser's Cafe	City of Cleveland	Cuyahoga		9.0	.	+	-	
Bay View Hospital	City of Bay Village	Cuyahoga	32	9.0	.	+/-	+/-	-
Hill, James, House	City of Cleveland	Cuyahoga		9.1	.	+	-	
Stanley Block	City of Cleveland	Cuyahoga		9.1	.	+	-	
Hotel Statler	City of Cleveland	Cuyahoga		9.1	.	+	-	
Greyhound Bus Station	City of Cleveland	Cuyahoga		9.1	.	+	-	
Kendel Building	City of Cleveland	Cuyahoga		9.1	.	+	-	
Record Rendezvous	City of Cleveland	Cuyahoga		9.1	.	+	-	
Herold Building	City of Cleveland	Cuyahoga		9.1	.	+	-	
Union Club	City of Cleveland	Cuyahoga		9.1	.	+	-	
Cleveland Trust Company	City of Cleveland	Cuyahoga		9.1	.	+	-	
Lower Prospect-Huron Historic District	City of Cleveland	Cuyahoga		9.1	.	+/-	-	
Irishtown Bend Archaeological District	City of Cleveland	Cuyahoga		9.2	.	+/-	-	
Playhouse Square Group	City of Cleveland	Cuyahoga		9.2	.	+	-	
Medical Centre Building	City of Cleveland	Cuyahoga		9.2	.	+	-	
Lindner Building	City of Cleveland	Cuyahoga		9.2	.	+	-	
Halle Building	City of Cleveland	Cuyahoga		9.2	.	+	-	
West Technical High School	City of Cleveland	Cuyahoga		9.2	.	+/-	-	
Caxton Building	City of Cleveland	Cuyahoga		9.2	.	+	-	
St Stephen Church	City of Cleveland	Cuyahoga		9.2	.	+	-	
Mueller Electric Company Building	City of Cleveland	Cuyahoga		9.3	.	+	-	
North Presbyterian Church	City of Cleveland	Cuyahoga		9.3	.	+	-	
Corlett Building	City of Cleveland	Cuyahoga		9.3	.	+/-	-	
Cleveland Grays Armory	City of Cleveland	Cuyahoga		9.3	.	+	-	

Visually Sensitive Resource	Location			Distance <sup>2</sup> Miles from Nearest Turbine	Distance Zone ● Foreground ● Midground ● Background	Project Visibility		
	City or Village	County	VP Number <sup>1</sup>			+ Visible	- Not Visible	+/- Partially Visible
					Topographic Viewshed	DSM Viewshed	Field Review	
St Ignatius High School	City of Cleveland	Cuyahoga		9.4	.	+/-	-	
Lorain Avenue Commercial Historic District	City of Cleveland	Cuyahoga		9.4	.	+/-	-	
Lake Shore Bank and Cleveland Public Library St. Clair Branch	City of Cleveland	Cuyahoga		9.4	.	+	-	
Lorain Station Historic District	City of Cleveland	Cuyahoga		9.4	.	+/-	-	
Stuyvesant Motor Company Building	City of Cleveland	Cuyahoga		9.4	.	+	-	
Lorain-Carnegie Bridge	City of Cleveland	Cuyahoga		9.4	.	+/-	+/-	
Miller Block	City of Cleveland	Cuyahoga		9.4	.	+	-	
Brownell School and Annex	City of Cleveland	Cuyahoga		9.4	.	+	-	
West Side Market	City of Cleveland	Cuyahoga		9.4	.	+	-	
Prospect Avenue Row House Group	City of Cleveland	Cuyahoga	49	9.5	.	+/-	-	-
University Hall, Cleveland State University	City of Cleveland	Cuyahoga		9.5	.	+/-	+/-	
Trinity Cathedral	City of Cleveland	Cuyahoga		9.5	.	+/-	-	
National Town and Country Club	City of Cleveland	Cuyahoga		9.5	.	+	-	
Trinity Cathedral Church Home	City of Cleveland	Cuyahoga		9.5	.	+	-	
Central YMCA	City of Cleveland	Cuyahoga		9.5	.	+	-	
Union Steel Screw Office Building	City of Cleveland	Cuyahoga		9.6	.	+	-	
Richman Brothers Company, The	City of Cleveland	Cuyahoga		9.6	.	+	-	
Joseph and Feiss Clothcraft Shops, The	City of Cleveland	Cuyahoga		9.6	.	+/-	+/-	
Walker and Weeks Office Building	City of Cleveland	Cuyahoga		9.6	.	+	-	
First Methodist Church	City of Cleveland	Cuyahoga	49	9.7	.	+	-	-
Gifford, Dr. William, House	City of Cleveland	Cuyahoga		9.7	.	+	-	
Zion Lutheran Church	City of Cleveland	Cuyahoga	49	9.7	.	+	-	-
Variety Store Building and Theatre	City of Cleveland	Cuyahoga		9.7	.	+	-	
Cleveland Masonic Temple	City of Cleveland	Cuyahoga		9.7	.	+/-	+/-	
Body Block	City of Cleveland	Cuyahoga		9.8	.	+	-	
Zion Lutheran School	City of Cleveland	Cuyahoga		9.8	.	+	-	
Merwin, George, House	City of Cleveland	Cuyahoga	49	9.8	.	+	-	-
Gaensslen, Phillip, House	City of Cleveland	Cuyahoga		9.8	.	+	-	
Stockbridge Apartment Building	City of Cleveland	Cuyahoga		9.8	.	+	-	
Rockefeller Park and Cleveland Cultural Gardens Historic District	City of Cleveland	Cuyahoga		9.8	.	+/-	-	
Rockefeller Park Bridges	City of Cleveland	Cuyahoga		9.8	.	+/-	-	
Templar-Farrell Motor Sales Building	City of Cleveland	Cuyahoga		9.8	.	+	-	
Plaza Apartments	City of Cleveland	Cuyahoga		9.8	.	+	-	
Tremont Historic District	City of Cleveland	Cuyahoga		9.8	.	+/-	-	
Stager-Beckwith House	City of Cleveland	Cuyahoga		9.8	.	+	+/-	
Ensworth, Jeremiah, House	City of Cleveland	Cuyahoga		9.8	.	+	-	
Southworth House	City of Cleveland	Cuyahoga		9.9	.	+	-	
Tavern Club	City of Cleveland	Cuyahoga		9.9	.	+	-	
Fairmont Creamery Company Ice Cream Building	City of Cleveland	Cuyahoga		9.9	.	+/-	-	
Neff Apartments	City of Cleveland	Cuyahoga		9.9	.	+	-	
Montana Apartments	City of Cleveland	Cuyahoga		9.9	.	+	-	
Scranton South Side Historic District	City of Cleveland	Cuyahoga		9.9	.	+/-	-	
Benedict, Sarah, House	City of Cleveland	Cuyahoga		9.9	.	+	-	
Pickands, Jay M., House	Village of Bratenahl	Cuyahoga		9.9	.	+	+/-	
Olney, Charles, House and Gallery	City of Cleveland	Cuyahoga		10.0	.	-	-	
Dixon Hall Apartments	City of Cleveland	Cuyahoga		10.0	.	+	-	
<b>Properties eligible for inclusion in the National or State Register of Historic Places</b>								
1191 Gladys	City of Lakewood	Cuyahoga		7.6	.	+	-	
17849 Clifton Ave	City of Lakewood	Cuyahoga		7.7	.	+	-	
14810 Detroit Ave	City of Lakewood	Cuyahoga		7.9	.	+	-	
1392 Warren Rd	City of Lakewood	Cuyahoga		7.9	.	+	-	



Visually Sensitive Resource	Location		VP Number <sup>1</sup>	Distance <sup>2</sup> Miles from Nearest Turbine	Distance Zone ● Foreground ● Midground ● Background	Project Visibility		
	City or Village	County				+Visible	- Not Visible	+/- Partially Visible
						Topographic Viewshed	DSM Viewshed	Field Review
14800 Detroit Ave	City of Lakewood	Cuyahoga		7.9	.	+	-	
14822 Detroit Ave	City of Lakewood	Cuyahoga		8.0	.	+	-	
13540 Elbur Lane	City of Lakewood	Cuyahoga		8.1	.	+	-	
13540 Elbur Lane	City of Lakewood	Cuyahoga		8.1	.	+	+/-	
11500 Detroit Avenue	City of Cleveland	Cuyahoga		8.2	.	+	-	
1354 Riverside Ave	City of Lakewood	Cuyahoga		8.2	.	+	-	
1483-1485 Cohasset Ave	City of Lakewood	Cuyahoga		8.3	.	+	-	
1544 Elmwood Ave	City of Lakewood	Cuyahoga		8.3	.	+	-	
1607 Woodward Ave	City of Lakewood	Cuyahoga		8.4	.	+	-	
1220 W. 3rd St.	City of Cleveland	Cuyahoga		8.5	.	+/-	+/-	
Main Avenue Bridge (SFN 180035)	City of Cleveland	Cuyahoga		8.6	.	+/-	+/-	
2019 Woodward Ave	City of Lakewood	Cuyahoga		8.6	.	+	-	
2022 Lincoln	City of Lakewood	Cuyahoga		8.6	.	+	-	
2023 Woodward Ave	City of Lakewood	Cuyahoga		8.6	.	+	-	
13229 Madison Ave	City of Lakewood	Cuyahoga		8.6	.	+	-	
19892 Eldora Dr	City of Rocky River	Cuyahoga		8.7	.	+	-	
Lakeview Terrace	City of Cleveland	Cuyahoga		8.7	.	+	+/-	
2.6 miles west of junction with I-90 (Old 1476)	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
1403 East 6th st	City of Cleveland	Cuyahoga		8.8	.	+	-	
2173-2175 Carabel Ave	City of Lakewood	Cuyahoga		8.9	.	+	-	
South of Center St. (Flats)	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
South of Center St. (Flats)	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
Located n.w. of Cleveland	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
910 feet west of Rocky River Dr. (Hilliard No. 65)	City of Lakewood, City of Rocky River	Cuyahoga		9.0	.	+/-	+/-	
1940 E 6th St	City of Cleveland	Cuyahoga		9.0	.	+	-	
1736 E Superior Ave	City of Cleveland	Cuyahoga		9.0	.	+	-	
1736 E Superior Ave	City of Cleveland	Cuyahoga		9.0	.	+	-	
South of Canal St. (Flats)	City of Cleveland	Cuyahoga		9.0	.	+/-	-	
1400 East 30th St	City of Cleveland	Cuyahoga		9.1	.	+	-	
2121 Ontario St	City of Cleveland	Cuyahoga		9.1	.	+	-	
1560 E. 21st	City of Cleveland	Cuyahoga		9.1	.	+	-	
510-512 Prospect Ave.	City of Cleveland	Cuyahoga		9.1	.	+	-	
200 Payne Avenue	City of Cleveland	Cuyahoga		9.2	.	+	-	
2219 Payne Ave	City of Cleveland	Cuyahoga		9.2	.	+	-	
2800 Superior Ave	City of Cleveland	Cuyahoga		9.2	.	+	-	
2108 Payne Ave	City of Cleveland	Cuyahoga		9.2	.	+	-	
2227 Payne Ave	City of Cleveland	Cuyahoga		9.2	.	+	-	
2250 Payne Ave	City of Cleveland	Cuyahoga		9.2	.	+	-	
2421 Payne Ave	City of Cleveland	Cuyahoga		9.2	.	+	-	
2300-2316 Payne Ave	City of Cleveland	Cuyahoga		9.2	.	+	-	
1647 E 25th St	City of Cleveland	Cuyahoga		9.2	.	+	-	
2400 Payne Ave	City of Cleveland	Cuyahoga		9.3	.	+	-	
East of Scranton Ave. (Flats)	City of Cleveland	Cuyahoga		9.3	.	-	-	
2007 West 65th St	City of Cleveland	Cuyahoga		9.3	.	+	-	
2201 West 93rd St	City of Cleveland	Cuyahoga		9.3	.	+/-	-	
2939 feet north of W. 25th St.	City of Cleveland	Cuyahoga		9.3	.	-	-	
1768 E 25th St	City of Cleveland	Cuyahoga		9.3	.	+	-	
2027 W 65th St	City of Cleveland	Cuyahoga		9.3	.	+	-	
East of W. 3rd St., under Eagle Ave.	City of Cleveland	Cuyahoga		9.3	.	+	-	
Brownell Court	City of Cleveland	Cuyahoga		9.3	.	+	-	
1741 E 25th St	City of Cleveland	Cuyahoga		9.3	.	+	-	

Visually Sensitive Resource	Location		VP Number <sup>1</sup>	Distance <sup>2</sup> Miles from Nearest Turbine	Distance Zone ● Foreground ● Midground ● Background	Project Visibility		
	City or Village	County				+Visible	- Not Visible	+/- Partially Visible
						Topographic Viewshed	DSM Viewshed	Field Review
1755 E 25th Ave	City of Cleveland	Cuyahoga		9.3	.	+	-	
Bridge Ave., W. 24th St., Lorain Ave., W. 25th St.	City of Cleveland	Cuyahoga		9.3	.	+	-	
2291 E 9th St	City of Cleveland	Cuyahoga		9.3	.	+	-	
1960 E 24th St	City of Cleveland	Cuyahoga		9.4	.	+	-	
5360 Stanard Ave	City of Cleveland	Cuyahoga		9.4	.	+	-	
1300 Sumner St	City of Cleveland	Cuyahoga		9.4	.	+	-	
Detroit Rd	City of Rocky River	Cuyahoga		9.4	.	+/-	+/-	
1332 Carnegie Ave	City of Cleveland	Cuyahoga		9.5	.	+	-	
300 Central Viaduct	City of Cleveland	Cuyahoga		9.5	.	+/-	-	
2200 Prospect Ave.	City of Cleveland	Cuyahoga		9.5	.	+	-	
2202 E. 20th St.	City of Cleveland	Cuyahoga		9.6	.	+	-	
10205 Lorain Ave	City of Cleveland	Cuyahoga		9.6	.	+/-	-	
21 miles east of junction with SR 283DA	City of Cleveland	Cuyahoga	56	9.6	.	+	+/-	+
2344 Prospect Ave	City of Cleveland	Cuyahoga		9.6	.	+	-	
2219 West 63rd	City of Cleveland	Cuyahoga		9.6	.	+/-	-	
3233 Euclid Ave.	City of Cleveland	Cuyahoga		9.7	.	+/-	+/-	
2163 E 22nd St.	City of Cleveland	Cuyahoga		9.7	.	+/-	-	
11401 Lorain Avenue	City of Cleveland	Cuyahoga		9.7	.	+	-	
2151 Scranton Rd	City of Cleveland	Cuyahoga		9.7	.	+/-	-	
23046 Detroit Rd	City of Westlake	Cuyahoga		9.7	.	+	-	
1130 addison	City of Cleveland	Cuyahoga		9.7	.	+	-	
2000 West 14th St	City of Cleveland	Cuyahoga		9.7	.	+/-	-	
3200 Monroe Ave	City of Cleveland	Cuyahoga		9.7	.	+/-	-	
South of Commercial Rd. (Flats)	City of Cleveland	Cuyahoga		9.8	.	-	-	
23319 Detroit Rd	City of Westlake	Cuyahoga		9.8	.	+	-	
City # 5:029	City of Cleveland	Cuyahoga		9.8	.	+/-	-	
<b>State Parks</b>								
None in Study Area								
<b>National Heritage Areas</b>								
Ohio & Erie Canalway	Village of Bratenahl, City of Cleveland	Cuyahoga	3, 6, 7, 9, 10, 16, 17, 18, 20, 27, 28, 45, 46, 47, 48, 49, 50, 51, 54, 56	8.2	.	+/-	+/-	+/-
<b>National Wildlife Refuges, State Game Refuges and State Wildlife Management Areas</b>								
None in Study Area								
<b>National Natural Landmarks</b>								
None in Study Area								
<b>National Parks, Recreation Areas, Seashores and/or Forests</b>								
None in Study Area								
<b>National or State Designated Wild, Scenic, or Recreational Rivers</b>								
None in Study Area								
<b>Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible as Scenic</b>								
Lake Erie Coastal Ohio Scenic Byway	Village of Bratenahl, City of Bay Village, City of Lakewood, City of Rocky River, City of Cleveland	Cuyahoga	7, 21, 22, 32, 36, 38, 39, 40, 41, 56	7.5	.	+/-	+/-	+/-
Ohio & Erie Canalway Scenic Byway	City of Cleveland	Cuyahoga	50, 51	8.7	.	+/-	+/-	-
Stinchcomb-Groth Memorial Scenic Overlook	City of Cleveland	Cuyahoga	44	9.3	.	+/-	-	-
<b>State and Federally Designated Trails</b>								
Ohio and Erie Canal Towpath Trail	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
<b>State Nature and Historic Preserve Areas</b>								
None in Study Area								

Visually Sensitive Resource	Location			Distance <sup>2</sup> Miles from Nearest Turbine	Distance Zone ● Foreground ● Midground ● Background	Project Visibility		
	City or Village	County	VP Number <sup>1</sup>			+Visible	- Not Visible	+/- Partially Visible
					Topographic Viewshed	DSM Viewshed	Field Review	
<b>State Historic Markers</b>								
102-18 Lakewood Park	City of Lakewood	Cuyahoga		7.3	.	+	-	
72-18 The Burnham Mall - The Group Plan of 1903	City of Cleveland	Cuyahoga		8.6	.	+	+/-	
79-18 The Ohio AFL-CIO	City of Cleveland	Cuyahoga		8.6	.	+	-	
106-18 The National Carbon Company	City of Lakewood	Cuyahoga		8.7	.	+	-	
66-18 The Old Stone Church	City of Cleveland	Cuyahoga		8.8	.	+	-	
81-18 Cuyahoga County Soldiers' and Sailors' Monument	City of Cleveland	Cuyahoga		8.9	.	+	-	
38-18 John D. Rockefeller, 1839-1937	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
2-18 The Arcade	City of Cleveland	Cuyahoga		9.0	.	+	-	
32-18 Cleveland Theater District	City of Cleveland	Cuyahoga		9.2	.	+	-	
65-18 Detective Martin J. McFadden	City of Cleveland	Cuyahoga		9.2	.	+	-	
55-18 Abdul-Baha and the Baha'i Faith	City of Cleveland	Cuyahoga		9.2	.	+	-	
37-18 Cleveland Grays	City of Cleveland	Cuyahoga		9.3	.	+	-	
86-18 Cleveland East Ohio Gas Explosion	City of Cleveland	Cuyahoga		9.3	.	+	-	
7-18 John W. Heisman Birth Site	City of Cleveland	Cuyahoga		9.4	.	+/-	-	
90-18 Erie Street Cemetery	City of Cleveland	Cuyahoga		9.4	.	+	-	
109-18 Market Square	City of Cleveland	Cuyahoga		9.5	.	+	-	
4-18 University Hall	City of Cleveland	Cuyahoga		9.6	.	+/-	-	
60-18 Garrett A. Morgan	City of Cleveland	Cuyahoga		9.6	.	+	-	
44-18 Journalist Dorothy Fuldheim	City of Cleveland	Cuyahoga		9.7	.	+	-	
97-18 Monroe Street Cemetery	City of Cleveland	Cuyahoga		9.7	.	+	-	
74-18 Camp Cleveland	City of Cleveland	Cuyahoga		9.9	.	+	-	
76-18 Sarah Benedict House	City of Cleveland	Cuyahoga		9.9	.	+	-	
78-18 The Fight for the Eight-Hour Day	City of Cleveland	Cuyahoga		10.0	.	+	-	
63-18 The Cleveland Cultural Gardens	City of Cleveland	Cuyahoga		10.0	.	+	-	
<b>Other Statewide Significant Resources</b>								
Lake Erie	(Adjacent to) Village of Bratenahl, City of Bay Village, City of Lakewood, City of Rocky River, City of Cleveland	(Adjacent to) Cuyahoga	1, 2, 4, 5, 6, 8, 10, 11, 12, 13, 14, 15, 19, 21, 23, 24, 25, 26, 30, 32, 36, 37, 38, 39, 52, 53, 54	0.0	●	+/-	+/-	+/-
<b>Locally Important Resources</b>								
<b>Areas of Intensive Land Use (City, Village, Hamlet)</b>								
City of Lakewood	City of Lakewood	Cuyahoga	12, 29, 30	7.1	.	+/-	+/-	+/-
City of Cleveland	City of Cleveland	Cuyahoga	3, 6, 7, 9, 10, 16, 17, 18, 19, 20, 23, 24, 25, 26, 27, 28, 33, 34, 44, 45, 46, 47, 48, 49, 50, 51, 54, 56	7.7	.	+/-	+/-	+/-
City of Rocky River	City of Rocky River	Cuyahoga	14, 15, 31, 40, 41, 42, 43	7.9	.	+/-	+/-	+/-
City of Bay Village	City of Bay Village	Cuyahoga	2, 21, 22, 32, 35, 36, 37, 38, 39	8.9	.	+/-	+/-	+/-
City of Fairview Park	City of Fairview Park	Cuyahoga		9.3	.	+/-	+/-	
City of Westlake	City of Westlake	Cuyahoga		9.4	.	+/-	+/-	
Village of Bratenahl	Village of Bratenahl	Cuyahoga	55	9.8	.	+/-	+/-	-
<b>Transportation Corridors</b>								
US 20	City of Westlake, City of Fairview Park, City of Lakewood, City of Rocky River, City of Cleveland	Cuyahoga	42, 43, 48, 51	7.5	.	+/-	+/-	-
US 6	City of Bay Village, City of Lakewood, City of Rocky River, City of Cleveland	Cuyahoga	21, 22, 32, 36, 38, 39, 40, 41, 51	7.6	.	+/-	+/-	+/-






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	City or Village	County				+ Visible	- Not Visible	+/- Partially Visible
						Topographic Viewshed	DSM Viewshed	Field Review
SR 237	City of Lakewood, City of Cleveland	Cuyahoga		8.0	.	+/-	-	
SR 2	City of Rocky River, City of Cleveland	Cuyahoga		8.3	.	+/-	+/-	
I 90	Village of Bratenahl, City of Westlake, City of Lakewood, City of Rocky River, City of Cleveland	Cuyahoga	56	8.6	.	+/-	+/-	+
US 42	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
US 422	City of Cleveland	Cuyahoga		8.9	.	+/-	-	
US 322	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
SR 254	City of Westlake, City of Rocky River	Cuyahoga		9.4	.	+/-	+/-	
SR 10	City of Fairview Park, City of Cleveland	Cuyahoga		9.4	.	+/-	+/-	
SR 252	City of Bay Village, City of Westlake	Cuyahoga		9.5	.	+/-	-	
I 77	City of Cleveland	Cuyahoga		9.6	.	+/-	-	
SR 283	Village of Bratenahl, City of Cleveland	Cuyahoga		9.9	.	+/-	+/-	
<b>Recreation Resources</b>								
<i>Local Parks and Playgrounds</i>								
Lakewood Park	City of Lakewood	Cuyahoga	12, 29	7.1	.	+/-	+/-	+/-
Clifton Beach	City of Lakewood	Cuyahoga	13	7.7	.	+	+/-	+
Kauffman Park	City of Lakewood	Cuyahoga		7.8	.	+	-	
Merl Blunts Park	City of Lakewood	Cuyahoga		7.8	.	+	-	
Webb Park	City of Lakewood	Cuyahoga		7.9	.	+	-	
Cove Park	City of Lakewood	Cuyahoga		7.9	.	+	-	
Edwards Park	City of Lakewood	Cuyahoga		7.9	.	+	-	
Lakefront Reservation - Edgewater Park	City of Cleveland	Cuyahoga	9, 23, 24, 25, 26	8.0	.	+/-	+/-	+
Bicentennial Park	City of Cleveland	Cuyahoga	19	8.2	.	+/-	+/-	+
Rocky River Park	City of Rocky River	Cuyahoga	14	8.2	.	+/-	+/-	+
Lakefront Reservation - Whiskey Island	City of Cleveland	Cuyahoga	10, 54	8.2	.	+/-	+/-	+
Cleveland Browns Stadium	City of Cleveland	Cuyahoga		8.3	.	+/-	+/-	
Rocky River Reservation	City of Fairview Park, City of Lakewood, City of Rocky River, City of Cleveland	Cuyahoga	43, 44	8.3	.	+/-	+/-	-
Wagar Park	City of Lakewood	Cuyahoga		8.5	.	+	+/-	
Fort Huntington Park	City of Cleveland	Cuyahoga		8.5	.	+	+/-	
Willard Park	City of Cleveland	Cuyahoga		8.6	.	+/-	+/-	
Madison Park	City of Lakewood	Cuyahoga		8.6	.	+	-	
Herman Playground	City of Cleveland	Cuyahoga		8.6	.	+	-	
Cudell Park	City of Cleveland	Cuyahoga	33	8.7	.	+	-	-
Bradstreet Landing	City of Rocky River	Cuyahoga	15	8.8	.	+/-	+/-	+
Elmwood Park	City of Rocky River	Cuyahoga		8.8	.	+/-	-	
Kirtland Park	City of Cleveland	Cuyahoga	20	8.8	.	+	+/-	+
Lakefront Reservation - E. 55th Street Marina	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
Fairview Park	City of Cleveland	Cuyahoga		9.1	.	+/-	-	
Quicken Loans Arena	City of Cleveland	Cuyahoga		9.1	.	+/-	-	
Sterling Park	City of Cleveland	Cuyahoga		9.1	.	+	-	
Tuland Playground	City of Cleveland	Cuyahoga		9.1	.	+/-	-	
Krenzler Field	City of Cleveland	Cuyahoga		9.1	.	+	+/-	
Franklin Circle	City of Cleveland	Cuyahoga		9.1	.	+	-	
Impet Park	City of Cleveland	Cuyahoga		9.2	.	+/-	-	
Cleveland Lakefront Nature Preserve	City of Cleveland	Cuyahoga	4	9.3	.	+/-	+/-	+/-
Belmont Park	City of Cleveland	Cuyahoga		9.3	.	+/-	+/-	
Jacobs Field	City of Cleveland	Cuyahoga		9.3	.	+/-	-	
Lakefront Reservation - Gordon Park	Village of Bratenahl, City of Cleveland	Cuyahoga	3, 56	9.3	.	+/-	+/-	+

Visually Sensitive Resource	Location			Distance <sup>2</sup> Miles from Nearest Turbine	Distance Zone ● Foreground ● Midground ● Background	Project Visibility			
	City or Village	County	VP Number <sup>1</sup>			+ Visible	- Not Visible	+/- Partially Visible	
					Topographic Viewshed	DSM Viewshed	Field Review		
Clague Park	City of Bay Village	Cuyahoga	35	9.3	.	+/-	-	-	
Mohican Playground	City of Cleveland	Cuyahoga		9.4	.	+/-	-	-	
Memorial Field Park	City of Rocky River	Cuyahoga		9.4	.	+	-	-	
Wager Park	City of Rocky River	Cuyahoga		9.5	.	+/-	+/-	-	
Sam Miller Park	City of Cleveland	Cuyahoga		9.8	.	+/-	+/-	-	
Jefferson Park	City of Cleveland	Cuyahoga		9.9	.	+/-	-	-	
Cahoon Memorial Park	City of Bay Village	Cuyahoga	2, 21, 22	9.9	.	+	+/-	+	
<i>Trails and Bike Routes</i>									
Route 20 to Lakeshore Blvd Bike Route	Village of Bratenahl, City of Westlake, City of Lakewood, City of Rocky River, City of Cleveland	Cuyahoga	26, 48	7.5	.	+/-	+/-	+/-	
Detroit Avenue Bikeway	City of Lakewood, City of Cleveland	Cuyahoga		7.9	.	+/-	+/-	-	
US 6 Bike Route	City of Bay Village, City of Lakewood, City of Rocky River	Cuyahoga	21, 22, 32, 36, 38, 39, 40, 41, 42, 43	8.3	.	+/-	+/-	+/-	
Cleveland Metropark Rocky River Reservation Trail	City of Fairview Park, City of Lakewood, City of Rocky River, City of Cleveland	Cuyahoga		8.3	.	+/-	+/-	-	
Franklin Boulevard Bikeway	City of Lakewood, City of Cleveland	Cuyahoga		8.5	.	+/-	-	-	
Ontario Street Bikeway	City of Cleveland	Cuyahoga	50, 51	8.6	.	+/-	+/-	-	
Detroit-Superior Bridge Bikeway	City of Cleveland	Cuyahoga		8.7	.	+/-	+/-	-	
Madison Avenue Bikeway	City of Cleveland	Cuyahoga		8.8	.	+	-	-	
Superior Avenue Bikeway	City of Cleveland	Cuyahoga	51	8.9	.	+/-	+/-	-	
Columbus Road Bikeway	City of Cleveland	Cuyahoga		9.0	.	+/-	+/-	-	
Lakefront - Gordon Park Bikeway	City of Cleveland	Cuyahoga		9.1	.	+/-	+/-	-	
Randall Road Bikeway	City of Cleveland	Cuyahoga		9.1	.	+	-	-	
Abbey Avenue Bikeway	City of Cleveland	Cuyahoga		9.5	.	+/-	+/-	-	
<i>Water Resources</i>									
Rocky River	City of Fairview Park, City of Lakewood, City of Rocky River, City of Cleveland	Cuyahoga	43	7.7	.	+/-	+/-	-	
Clifton Lagoon	City of Lakewood	Cuyahoga		7.8	.	+/-	+/-	-	
Cuyahoga River	City of Cleveland	Cuyahoga	11, 52, 54	8.1	.	+/-	+/-	+	
Sperry Creek	City of Bay Village, City of Westlake	Cuyahoga		9.0	.	+/-	+/-	-	
Doan Brook	City of Cleveland	Cuyahoga		9.5	.	+/-	+/-	-	
<i>Golf Courses</i>									
Westwood Country Club	City of Westlake, City of Rocky River	Cuyahoga		9.6	.	+/-	+/-	-	
<b>Schools and Colleges</b>									
Lincoln Elementary School	City of Lakewood	Cuyahoga		7.5	.	+	-	-	
Saint Luke Elementary School	City of Lakewood	Cuyahoga		7.6	.	+	-	-	
Emerson Middle School	City of Lakewood	Cuyahoga		7.6	.	+	-	-	
Horace Mann Middle School	City of Lakewood	Cuyahoga		7.7	.	+	-	-	
Saint Edward High School	City of Lakewood	Cuyahoga		7.9	.	+	-	-	
Grant Elementary School	City of Lakewood	Cuyahoga		8.1	.	+	+/-	-	
Lakewood High School	City of Lakewood	Cuyahoga		8.1	.	+/-	+/-	-	
Franklin Elementary School	City of Lakewood	Cuyahoga		8.3	.	+	-	-	
Louisa M Alcott Elementary School	City of Cleveland	Cuyahoga		8.4	.	+	-	-	
Harding Middle School	City of Lakewood	Cuyahoga		8.5	.	+/-	-	-	
Madison Elementary School	City of Lakewood	Cuyahoga		8.5	.	+/-	-	-	
Marion C Seltzer Elementary School	City of Cleveland	Cuyahoga		8.7	.	+/-	-	-	
St Christopher Elementary School	City of Rocky River	Cuyahoga		8.8	.	+/-	+/-	-	
Harrison Elementary School	City of Lakewood	Cuyahoga		8.8	.	+	-	-	
Rocky River Middle School	City of Rocky River	Cuyahoga		8.8	.	+	+/-	-	
Max S Hayes High School	City of Cleveland	Cuyahoga		8.8	.	+	+/-	-	

Visually Sensitive Resource	Location		VP Number <sup>1</sup>	Distance <sup>2</sup> Miles from Nearest Turbine	Distance Zone ● Foreground ● Midground ● Background	Project Visibility		
	City or Village	County				+Visible	- Not Visible	+/- Partially Visible
						Topographic Viewshed	DSM Viewshed	Field Review
Watterson-Lake Elementary School	City of Cleveland	Cuyahoga		8.8	.	+	-	
Urban Community Elementary School	City of Cleveland	Cuyahoga		8.9	.	+	-	
Rocky River High School	City of Rocky River	Cuyahoga		8.9	.	+/-	+/-	
Hayes Elementary School	City of Lakewood	Cuyahoga		8.9	.	+/-	-	
Joseph M Gallagher Middle School	City of Cleveland	Cuyahoga		9.0	.	+	-	
Waverly Elementary School	City of Cleveland	Cuyahoga		9.1	.	+	-	
Buhrer/Kentucky Elementary School	City of Cleveland	Cuyahoga		9.1	.	+	-	
Garrett Morgan School of Science	City of Cleveland	Cuyahoga		9.1	.	+/-	-	
Metro Catholic Parish School	City of Cleveland	Cuyahoga		9.2	.	+	-	
Ohio Technical College	City of Cleveland	Cuyahoga		9.3	.	+	-	
Magnificat High School	City of Rocky River	Cuyahoga		9.3	.	+	+/-	
Cleveland State University	City of Cleveland	Cuyahoga		9.3	.	+/-	+/-	
Case Elementary School	City of Cleveland	Cuyahoga		9.3	.	+	-	
Saint Ignatius High School	City of Cleveland	Cuyahoga		9.4	.	+/-	-	
Riverside Elementary School	City of Cleveland	Cuyahoga		9.4	.	+/-	-	
Booker Montessori Elementary School	City of Cleveland	Cuyahoga		9.5	.	+/-	-	
Orchard S.T.E.M. School	City of Cleveland	Cuyahoga		9.6	.	+	-	
Paul L Dunbar Elementary School	City of Cleveland	Cuyahoga		9.6	.	+	-	
Life Skills High School of Cleveland	City of Cleveland	Cuyahoga		9.7	.	+/-	+/-	
McKinley Elementary School	City of Cleveland	Cuyahoga		9.7	.	+/-	-	
Crown Academy	City of Cleveland	Cuyahoga		9.7	.	+	-	
Clark Elementary School	City of Cleveland	Cuyahoga		9.8	.	-	-	
Saint Joseph Academy	City of Cleveland	Cuyahoga		9.8	.	+	-	
Wilber Wright Middle School	City of Cleveland	Cuyahoga		9.8	.	+	+/-	
Rockefeller Fundamental Elementary School	City of Cleveland	Cuyahoga		9.8	.	+	-	
Saint Vincent de Paul School	City of Cleveland	Cuyahoga		9.9	.	+/-	-	
Almira Elementary School	City of Cleveland	Cuyahoga		9.9	.	+	-	
Marion-Sterling Elementary School	City of Cleveland	Cuyahoga		9.9	.	+	-	
Goldwood Primary Elementary School	City of Rocky River	Cuyahoga		9.9	.	+	-	
Cuyahoga Community College	City of Cleveland	Cuyahoga		9.9	.	+/-	-	
Charles H Lake Elementary School	City of Cleveland	Cuyahoga		9.9	.	+	+/-	
<b>Libraries</b>								
Lakewood Public Library	City of Lakewood	Cuyahoga		8.0	.	+	-	
Madison Branch Lakewood Public Library	City of Lakewood	Cuyahoga		8.6	.	+/-	-	
Walz Branch Cleveland Public Library	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
Rocky Ridge Public Library	City of Rocky River	Cuyahoga		8.8	.	+	-	
Cleveland Public Library	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
Carnegie West Branch Cleveland Public Library	City of Cleveland	Cuyahoga		9.4	.	+	-	
Lorain Branch Cleveland Public Library	City of Cleveland	Cuyahoga		9.4	.	+	-	
Eastman Branch Cleveland Public Library	City of Cleveland	Cuyahoga		9.7	.	+	-	
Sterling Branch Cleveland Public Library	City of Cleveland	Cuyahoga		9.9	.	+	-	
<b>Airports</b>								
Burke Lakefront Airport	City of Cleveland	Cuyahoga	7	8.2	.	+/-	+/-	+
<b>Hospitals</b>								
Lakewood Hospital	City of Lakewood	Cuyahoga		8.0	.	+/-	-	
Saint Johns Hospital	City of Cleveland	Cuyahoga		8.8	.	+	-	
Lutheran Hospital	City of Cleveland	Cuyahoga		9.1	.	+/-	-	
Saint Vincents Hospital	City of Cleveland	Cuyahoga		9.6	.	+/-	-	
Grace Hospital	City of Cleveland	Cuyahoga		10.0	.	+/-	-	
<b>Cemeteries</b>								
Hahn-McMahon Cemetery	City of Rocky River	Cuyahoga		8.2	.	+	-	

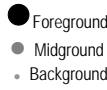


Visually Sensitive Resource	Location		VP Number <sup>1</sup>	Distance <sup>2</sup>	Distance Zone	Project Visibility		
	City or Village	County		Miles from Nearest Turbine	 Foreground  Midground  Background	+ Visible	- Not Visible	+/- Partially Visible
				Topographic Viewshed	DSM Viewshed	Field Review		
Anshe Emeth Cemetery	City of Cleveland	Cuyahoga		9.1	.	+	-	
Erie Street Cemetery	City of Cleveland	Cuyahoga		9.3	.	+	-	
Lakewood Park Cemetery	City of Rocky River	Cuyahoga		9.4	.	+/-	+/-	
Farr Cemetery	City of Westlake	Cuyahoga		9.7	.	+/-	-	
Willett Cemetery	City of Cleveland	Cuyahoga		9.7	.	+	-	
Monroe Cemetery	City of Cleveland	Cuyahoga		9.7	.	+/-	-	
Mother House Cemetery	City of Cleveland	Cuyahoga		9.7	.	+	-	
<b>Designated Cleveland Landmarks</b>								
Fifth Church of Christ Scientist	City of Cleveland	Cuyahoga		7.9	.	+	-	
United States Coast Guard Cleveland Harbor Station	City of Cleveland	Cuyahoga	11, 52, 54	8.1	.	+/-	+/-	+
Cleveland Harbor East and West Pierhead Lights and Accessory Structures		Cuyahoga	11, 53	8.1	.	+	+	+
Hulett Unloaders and C & P Ore Dock	City of Cleveland	Cuyahoga		8.2	.	+/-	+/-	
Edgar A. Stanley House	City of Cleveland	Cuyahoga		8.3	.	+	-	
Eliza Jennings Home Monument	City of Cleveland	Cuyahoga		8.5	.	+	-	
Globe Machine and Stamping Company	City of Cleveland	Cuyahoga	45	8.5	.	+	+/-	+
Cuyahoga County Courthouse	City of Cleveland	Cuyahoga		8.6	.	+/-	-	
Cleveland City Hall	City of Cleveland	Cuyahoga		8.6	.	+/-	+/-	
White Chewing Gum Factory (White Chicle Co.)	City of Cleveland	Cuyahoga		8.6	.	+/-	+/-	
Oppmann Terrace (Boulevard Terrace Apartments)	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
Public Auditorium	City of Cleveland	Cuyahoga		8.7	.	+/-	+/-	
Bingham Building	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
Johnny Kilbane House	City of Cleveland	Cuyahoga		8.7	.	+	-	
Woodland Avenue and West Side Street Railway Powerhouse (Powerhouse at Nautica)	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
Kirtland Park	City of Cleveland	Cuyahoga	20	8.7	.	+/-	+/-	+
Cudell Clock Tower (Cudell Park)	City of Cleveland	Cuyahoga		8.7	.	+	-	
Lorenzo Carter Cabin Site	City of Cleveland	Cuyahoga		8.7	.	+/-	-	
Standard Building	City of Cleveland	Cuyahoga		8.8	.	+	-	
Neal Terrace	City of Cleveland	Cuyahoga		8.8	.	+	-	
Old Stone Church (First Presbyterian)	City of Cleveland	Cuyahoga		8.8	.	+	-	
L.F. & S. Burgess Grocers	City of Cleveland	Cuyahoga		8.8	.	+	-	
Hilliard Block	City of Cleveland	Cuyahoga		8.8	.	+	-	
Watterson-Lake Elementary School	City of Cleveland	Cuyahoga		8.8	.	+	+/-	
John Cain Building (Myron*)	City of Cleveland	Cuyahoga		8.8	.	+	-	
Holy Resurrection Church	City of Cleveland	Cuyahoga		8.9	.	+	-	
Western Reserve Building	City of Cleveland	Cuyahoga		8.9	.	+/-	-	
Soldiers & Sailors Monument	City of Cleveland	Cuyahoga	50, 51	8.9	.	+	-	-
Cleveland Public Library (Main)	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
Hubbard Cooke Building	City of Cleveland	Cuyahoga		8.9	.	+	-	
Horace Rossiter House	City of Cleveland	Cuyahoga		8.9	.	+	-	
Superior Avenue Viaduct	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-	
Mansfield-Fuller House	City of Cleveland	Cuyahoga		8.9	.	+	-	
Leader Building	City of Cleveland	Cuyahoga		8.9	.	+/-	-	
Crowl-Shorr/McKnight House	City of Cleveland	Cuyahoga		8.9	.	+	-	
East Ohio Gas Company Building	City of Cleveland	Cuyahoga		9.0	.	+	-	
Primera Iglesia Adventista del Septimo Dia Hispana de Cleveland (Franklin Avenue Congregational)	City of Cleveland	Cuyahoga		9.0	.	+	-	
Hanna-Figueroa House	City of Cleveland	Cuyahoga		9.0	.	+	-	
May Company Building	City of Cleveland	Cuyahoga		9.0	.	+	-	
Baker Building (Fidelity Building)	City of Cleveland	Cuyahoga		9.0	.	+	-	
Mary and Matthew Stepp House	City of Cleveland	Cuyahoga		9.0	.	+	-	
St. John Episcopal Church	City of Cleveland	Cuyahoga		9.0	.	+/-	-	
Cleveland Fire Station 4	City of Cleveland	Cuyahoga		9.0	.	+	-	

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	City or Village	County				+ Visible	- Not Visible	+/- Partially Visible
						Topographic Viewshed	DSM Viewshed	Field Review
St. Peter Church Parish House and Hall	City of Cleveland	Cuyahoga		9.0	.	+	-	
Dr. George Crile Office	City of Cleveland	Cuyahoga		9.0	.	+	-	
Tower Press Building (H. Black Co.)	City of Cleveland	Cuyahoga		9.0	.	+	-	
Euclid Arcade	City of Cleveland	Cuyahoga		9.0	.	+/-	-	
Sanderson-Makar House	City of Cleveland	Cuyahoga		9.0	.	+	-	
Brooks-Figueroa House	City of Cleveland	Cuyahoga		9.0	.	+	-	
Lynch House	City of Cleveland	Cuyahoga		9.1	.	+	-	
Bevelin-Ackland House	City of Cleveland	Cuyahoga		9.1	.	+	-	
Cleveland Fire Station/Carriage House	City of Cleveland	Cuyahoga		9.1	.	+/-	-	
Central Police Station	City of Cleveland	Cuyahoga		9.1	.	+/-	-	
West Side YMCA	City of Cleveland	Cuyahoga		9.1	.	+	-	
Ball-Wilson House	City of Cleveland	Cuyahoga		9.1	.	+	-	
Union Club	City of Cleveland	Cuyahoga		9.1	.	+	-	
Jacob Vidmar Building	City of Cleveland	Cuyahoga		9.1	.	+	-	
Cuyahoga County Archives; Nelson Sanford House	City of Cleveland	Cuyahoga		9.1	.	+/-	-	
Rose Building	City of Cleveland	Cuyahoga		9.1	.	+	-	
Hermit Club	City of Cleveland	Cuyahoga		9.1	.	+	-	
Groh Mansion	City of Cleveland	Cuyahoga		9.2	.	+	-	
Franklin Circle Christian Church	City of Cleveland	Cuyahoga		9.2	.	+/-	-	
Sidney Hillman Memorial Building (Amalgamated Clothing Workers / Norma Herr Woman's Center)	City of Cleveland	Cuyahoga		9.2	.	+	-	
Film Exchange Building	City of Cleveland	Cuyahoga		9.2	.	+	-	
Cinecraft Building (Cleveland Public Library West Side Branch)	City of Cleveland	Cuyahoga		9.2	.	+	-	
Lindner Building	City of Cleveland	Cuyahoga		9.2	.	+	-	
Vogt Building	City of Cleveland	Cuyahoga		9.2	.	+	-	
Caxton Building	City of Cleveland	Cuyahoga		9.2	.	+	-	
Railroad Bridge	Village of Bratenahl, City of Cleveland	Cuyahoga		9.2	.	+/-	+/-	
Starr Piano-Gennett Records Building	City of Cleveland	Cuyahoga		9.2	.	+	-	
St. Stephen Church and School	City of Cleveland	Cuyahoga		9.2	.	+	-	
West Technical High School	City of Cleveland	Cuyahoga		9.3	.	+/-	+/-	
St. Patrick R.C. Church	City of Cleveland	Cuyahoga		9.3	.	+	-	
Mueller Electric Company Building	City of Cleveland	Cuyahoga		9.3	.	+	+/-	
St. Colman Church, School, Rectory, and Sisters Home	City of Cleveland	Cuyahoga		9.3	.	+	-	
North Presbyterian Church	City of Cleveland	Cuyahoga		9.3	.	+	+/-	
Immaculate Conception Church School and Rectory	City of Cleveland	Cuyahoga		9.3	.	+	-	
Cleveland Grays Armory	City of Cleveland	Cuyahoga		9.3	.	+	-	
Erie Street Cemetery	City of Cleveland	Cuyahoga		9.3	.	+	-	
Carnegie-West Library	City of Cleveland	Cuyahoga		9.4	.	+	+/-	
St. Ignatius High School	City of Cleveland	Cuyahoga		9.4	.	+/-	-	
Lake Shore Bank / Cleveland Public Library St. Clair Branch	City of Cleveland	Cuyahoga		9.4	.	+	-	
Shovel Works	City of Cleveland	Cuyahoga		9.4	.	+	+/-	
Stuyvesant Motor Company	City of Cleveland	Cuyahoga		9.4	.	+	-	
Miller Block	City of Cleveland	Cuyahoga		9.4	.	+	-	
Market Street Exchange	City of Cleveland	Cuyahoga		9.4	.	+	-	
West Side Market	City of Cleveland	Cuyahoga		9.4	.	+	-	
Samuel Mather Mansion	City of Cleveland	Cuyahoga		9.5	.	+/-	+/-	
Trinity Episcopal Cathedral & Hall	City of Cleveland	Cuyahoga		9.5	.	+/-	-	
Cleveland Fire Department Signal Exchange Headquarters (Engine Co. No. 28)	City of Cleveland	Cuyahoga		9.5	.	+	-	
Anna Wandel Building (Laisy*)	City of Cleveland	Cuyahoga		9.5	.	+	-	
Fenn Tower (National Town and Country Club)	City of Cleveland	Cuyahoga		9.5	.	+	-	
Kate L. and George W. Howe House	City of Cleveland	Cuyahoga		9.5	.	+/-	-	
United Office Building	City of Cleveland	Cuyahoga		9.5	.	+	-	

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	City or Village	County	+Visible				- Not Visible	+/- Partially Visible	
									Topographic Viewshed
Trinity Evangelical Lutheran Church	City of Cleveland	Cuyahoga		9.5	.	+	-		
Slovenian National Home and Auditorium	City of Cleveland	Cuyahoga		9.5	.	+	-		
Edward J. Kovacic Recreation Center	City of Cleveland	Cuyahoga		9.5	.	+	-		
German Baptist Publication Society Building	City of Cleveland	Cuyahoga		9.5	.	+	-		
Richman Brothers Factory	City of Cleveland	Cuyahoga		9.6	.	+	-		
St. Ignatius of Antioch R.C. Church	City of Cleveland	Cuyahoga		9.6	.	+/-	-		
Denison Avenue United Church of Christ	City of Cleveland	Cuyahoga		9.6	.	+	-		
Independent Evangelical Church	City of Cleveland	Cuyahoga		9.6	.	+	-		
Joseph and Feiss Factory	City of Cleveland	Cuyahoga		9.6	.	+/-	-		
Cleveland Learning Center at Halle	City of Cleveland	Cuyahoga		9.6	.	+	-		
3101 Euclid Building	City of Cleveland	Cuyahoga		9.6	.	+	-		
McKinley Elementary School	City of Cleveland	Cuyahoga		9.6	.	+/-	+/-		
May Company Warehouse	City of Cleveland	Cuyahoga		9.7	.	+	+/-		
Lorain Medical Building	City of Cleveland	Cuyahoga		9.7	.	+	+/-		
Cuyahoga County Juvenile Court Building	City of Cleveland	Cuyahoga		9.7	.	+/-	-		
Guardian Trust Bank Building - Lorain-West 117th Street Branch	City of Cleveland	Cuyahoga		9.7	.	+/-	-		
Cleveland Christian Home for Children	City of Cleveland	Cuyahoga		9.7	.	+	-		
First Methodist Church	City of Cleveland	Cuyahoga	49	9.7	.	+	-	-	
Willson Middle School	City of Cleveland	Cuyahoga		9.7	.	+/-	-		
Cedar-Central Apartments	City of Cleveland	Cuyahoga		9.7	.	+	-		
Monroe Street Cemetery	City of Cleveland	Cuyahoga		9.7	.	+/-	-		
Zion Lutheran Church	City of Cleveland	Cuyahoga	49	9.7	.	+	-	-	
Variety Theater	City of Cleveland	Cuyahoga		9.7	.	+	-		
Cleveland Masonic Temple	City of Cleveland	Cuyahoga		9.7	.	+/-	+/-		
Fine Arts Building	City of Cleveland	Cuyahoga		9.8	.	+	-		
Rowfant Club (George Merwin House)	City of Cleveland	Cuyahoga	49	9.8	.	+	-	-	
Stockbridge Apartments	City of Cleveland	Cuyahoga		9.8	.	+	-		
Cleveland Greenhouse & Gardens	City of Cleveland	Cuyahoga		9.8	.	+/-	-		
Mount Calvary Evangelical Lutheran Church and School	City of Cleveland	Cuyahoga		9.8	.	+	-		
Stager-Beckwith House (University Club)	City of Cleveland	Cuyahoga		9.8	.	+	+/-		
Wilbur Wright Middle School	City of Cleveland	Cuyahoga		9.8	.	+	-		
Fellowship Baptist Church of Christ (Grace Evangelical Lutheran Church)	City of Cleveland	Cuyahoga		9.8	.	+	-		
Prospect Avenue Rowhouses	City of Cleveland	Cuyahoga		9.9	.	+	-		
Fairmont Creamery Company Ice Cream Building	City of Cleveland	Cuyahoga		9.9	.	+/-	-		
Tavern Club	City of Cleveland	Cuyahoga		9.9	.	+	-		
Hodge School	City of Cleveland	Cuyahoga		9.9	.	+	-		
Leisy Brewery Bottling Works Building	City of Cleveland	Cuyahoga		9.9	.	+/-	-		
Luther Moses House	City of Cleveland	Cuyahoga		9.9	.	+	-		
Craig Motor Company (National Casket Co./Kohn Building)	City of Cleveland	Cuyahoga		9.9	.	+	-		
Nathaniel Hawthorne School	City of Cleveland	Cuyahoga		9.9	.	+/-	-		
Charles Olney Residence and Gallery	City of Cleveland	Cuyahoga		10.0	.	-	-		
Czech Sokol Hall (Ceska Sin Sokol)	City of Cleveland	Cuyahoga		10.0	.	+/-	-		
St. Philip Christian Church	City of Cleveland	Cuyahoga		10.0	.	+	-		
<b>Designated Cleveland Landmark Districts</b>									
Clifton Blvd. /West Blvd.	City of Cleveland	Cuyahoga	33, 34	7.9	.	+/-	-	-	
Hulett	City of Cleveland	Cuyahoga		8.2	.	+/-	+/-		
Warehouse	City of Cleveland	Cuyahoga		8.5	.	+/-	+/-		
Mall	City of Cleveland	Cuyahoga	16, 17, 18, 28	8.5	.	+/-	+/-	+/-	
Gordon Square	City of Cleveland	Cuyahoga		8.7	.	+/-	+/-		
Franklin - West Clinton	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-		
Ohio City	City of Cleveland	Cuyahoga		8.9	.	+/-	+/-		



Visually Sensitive Resource	Location			Distance <sup>2</sup> Miles from Nearest Turbine	Distance Zone 	Project Visibility		
	City or Village	County	VP Number <sup>1</sup>			+ Visible	- Not Visible	+/- Partially Visible
						Topographic Viewshed	DSM Viewshed	Field Review
East 4th Street	City of Cleveland	Cuyahoga		9.0	.	+	-	
Playhouse Square	City of Cleveland	Cuyahoga		9.2	.	+/-	-	
Market Square	City of Cleveland	Cuyahoga		9.3	.	+/-	+/-	
Lorain Avenue	City of Cleveland	Cuyahoga		9.4	.	+/-	-	
Lorain Station	City of Cleveland	Cuyahoga		9.4	.	+/-	-	
Prospect Avenue	City of Cleveland	Cuyahoga	49	9.5	.	+/-	-	-
Lorain Variety	City of Cleveland	Cuyahoga		9.6	.	+/-	+/-	
Tremont	City of Cleveland	Cuyahoga		9.9	.	-	-	

<sup>1</sup> If no viewpoint (VP) number is indicated, no photo was obtained during fieldwork.

<sup>2</sup> For large areas and linear sites, approximate distance to the nearest turbine was measured from the respective area's closest point.

## **Appendix B**

Photo Log and Field Notes  
(See Enclosed CD)



### Viewpoint 1

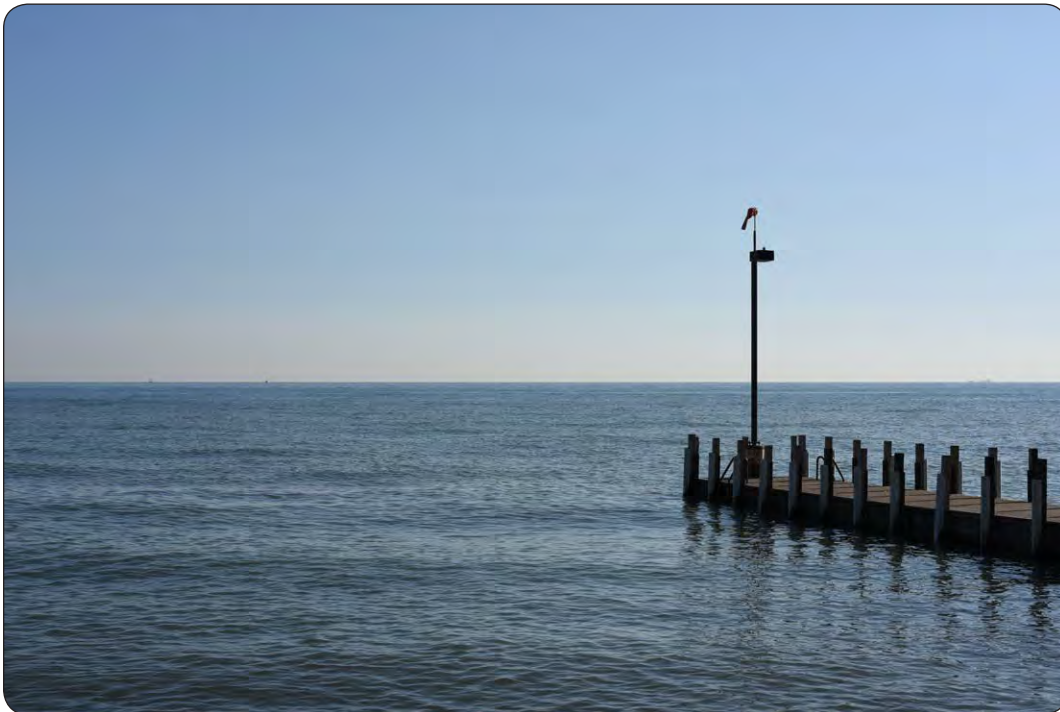
**Location:**  
View from Cahoon  
Memorial Park looking  
Northeast

**City or Village:**  
Bay Village

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
573.344

**Project Visible:**  
Yes



### Viewpoint 2

**Location:**  
View from Cahoon  
Memorial Park looking  
Northeast

**City or Village:**  
Bay Village

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
573.112

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 3

**Location:**  
View from Cleveland  
Lakefront State Park  
(Gordon Park) looking  
Northwest

**City or Village:**  
East Cleveland

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
618.342

**Project Visible:**  
Yes



### Viewpoint 4

**Location:**  
View from Cleveland  
Lakefront Nature Preserve  
looking Northwest

**City or Village:**  
East Cleveland

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
588.734

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



### Viewpoint 5

**Location:**  
View from Cleveland  
Lakefront Nature Preserve  
looking Northwest

**City or Village:**  
East Cleveland

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
592.938

**Project Visible:**  
Yes



### Viewpoint 6

**Location:**  
View from Universal  
Terminal Company Dock  
and Warehouse looking  
Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Residential

**Elevation:**  
575.456

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 7

**Location:**  
View from USS COD  
(Submarine) looking  
Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
581.013

**Project Visible:**  
Yes



### Viewpoint 8

**Location:**  
View from Edgewater  
State Park Bluff looking  
North Northwest

**City or Village:**  
Brooklyn

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
581.979

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 9

**Location:**  
View from Edgewater  
State Park Beach looking  
North Northwest

**City or Village:**  
Brooklyn

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
576.141

**Project Visible:**  
Yes



### Viewpoint 10

**Location:**  
View from Whiskey Island  
(Wendy Park) looking  
North Northwest

**City or Village:**  
Brooklyn

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
579.545

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



### Viewpoint 11

**Location:**  
View from U.S. Coast  
Guard Cleveland Harbor  
Station looking North  
Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Industrial

**Elevation:**  
573.169

**Project Visible:**  
Yes



### Viewpoint 12

**Location:**  
View from Lakewood Park  
looking North

**City or Village:**  
Rockport

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
625.835

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



### Viewpoint 13

**Location:**  
View from Clifton Park  
Lakefront Historic District  
(Clifton Beach) looking  
North

**City or Village:**  
Rockport

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
575.714

**Project Visible:**  
Yes



### Viewpoint 14

**Location:**  
View from Rocky River  
Park Overlook Platform  
looking North

**City or Village:**  
Rockport

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
621.19

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 15

**Location:**  
View from Bradstreet  
Landing Park looking  
North Northeast

**City or Village:**  
Rocky River

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
598.197

**Project Visible:**  
Yes



### Viewpoint 16

**Location:**  
View from Cleveland Mall  
looking North Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Urban Park

**Elevation:**  
653.844

**Project Visible:**  
No

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



### Viewpoint 17

Location:  
View from Cleveland Mall  
looking North Northwest

City or Village:  
Cleveland

Landscape Zone:  
Urban Park

Elevation:  
644.88

Project Visible:  
Yes



### Viewpoint 18

Location:  
View from Cleveland Mall  
looking North Northwest

City or Village:  
Cleveland

Landscape Zone:  
Urban Park

Elevation:  
647.952

Project Visible:  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 19

**Location:**  
View from Bicentennial  
Park looking North  
Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
579.193

**Project Visible:**  
Yes



### Viewpoint 20

**Location:**  
View from Kirtland Park  
looking North Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
605.972

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 21

**Location:**  
View from Cahoon  
Memorial Park looking  
Northeast

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
619.365

**Project Visible:**  
Yes



### Viewpoint 22

**Location:**  
View from Lake Erie  
Coastal Ohio National  
Scenic Byway looking  
Northeast

**City or Village:**  
Cleveland

**Landscape Zone:**  
Residential

**Elevation:**  
619.777

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



### Viewpoint 23

Location:  
View from Edgewater  
State Park looking North

City or Village:  
Brooklyn

Landscape Zone:  
Waterfront Park

Elevation:  
631.756

Project Visible:  
Yes



### Viewpoint 24

Location:  
View from Cliff Drive  
looking North

City or Village:  
Brooklyn

Landscape Zone:  
Waterfront Residential

Elevation:  
637.273

Project Visible:  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



### Viewpoint 25

**Location:**  
View from Upper  
Edgewater Drive Overlook  
looking North

**City or Village:**  
Brooklyn

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
606.968

**Project Visible:**  
Yes



### Viewpoint 26

**Location:**  
View from Edgewater  
State Park looking North

**City or Village:**  
Brooklyn

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
637.669

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 27

Location:  
View from Gordon Square  
Bridge looking North

City or Village:  
Brooklyn

Landscape Zone:  
Residential

Elevation:  
634.25

Project Visible:  
Yes



### Viewpoint 28

Location:  
View from Euclid Avenue  
Historic District. Elevated  
View from Key Building  
looking North Northwest

City or Village:  
Cleveland

Landscape Zone:  
Urban Commercial

Elevation:  
1423.549

Project Visible:  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



### Viewpoint 29

**Location:**  
View from John Honam House, Lakewood Park looking North

**City or Village:**  
Rockport

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
638.05

**Project Visible:**  
No



### Viewpoint 30

**Location:**  
View from Clifton Park Lakefront Historic District looking East

**City or Village:**  
Rockport

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
633.633

**Project Visible:**  
No

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 31

Location:  
View from Westlake Hotel  
looking North

City or Village:  
Rockport

Landscape Zone:  
Urban Residential

Elevation:  
651.081

Project Visible:  
No



### Viewpoint 32

Location:  
View from Bay View  
Hospital looking North

City or Village:  
Bay Village

Landscape Zone:  
Waterfront Residential

Elevation:  
622.189

Project Visible:  
No

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 33

**Location:**  
View from Cudell Park  
and Oppmann Terrace  
looking North

**City or Village:**  
Brooklyn

**Landscape Zone:**  
Residential

**Elevation:**  
687.904

**Project Visible:**  
No



### Viewpoint 34

**Location:**  
View from West Boulevard  
looking North

**City or Village:**  
Brooklyn

**Landscape Zone:**  
Residential

**Elevation:**  
703.717

**Project Visible:**  
No

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



### Viewpoint 35

Location:  
View from Clague Park  
looking North Northeast

City or Village:  
Bay Village

Landscape Zone:  
Park

Elevation:  
648.603

Project Visible:  
No



### Viewpoint 36

Location:  
View from Fordham  
Parkway And Lake Road  
looking North

City or Village:  
Bay Village

Landscape Zone:  
Residential

Elevation:  
632.264

Project Visible:  
No

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 37

**Location:**  
View from Lakeview Drive  
looking North Northeast

**City or Village:**  
Bay Village

**Landscape Zone:**  
Waterfront Residential

**Elevation:**  
623.291

**Project Visible:**  
Yes



### Viewpoint 38

**Location:**  
View from Lake Erie  
Coastal Ohio National  
Scenic Byway At  
Canterbury Road looking  
North Northeast

**City or Village:**  
Bay Village

**Landscape Zone:**  
Waterfront Residential

**Elevation:**  
657.56

**Project Visible:**  
No

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 39

Location:  
View from Lake Park  
Drive looking North  
Northeast

City or Village:  
Bay Village

Landscape Zone:  
Waterfront Residential

Elevation:  
657.841

Project Visible:  
No



### Viewpoint 40

Location:  
View from Lake Erie  
Coastal Ohio National  
Scenic Byway looking  
North

City or Village:  
Rocky River

Landscape Zone:  
Urban Commercial

Elevation:  
621.668

Project Visible:  
No

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 41

Location:  
View from Lake Erie  
Coastal Ohio National  
Scenic Byway looking  
North

City or Village:  
Rocky River

Landscape Zone:  
Urban Commercial

Elevation:  
630.458

Project Visible:  
No



### Viewpoint 42

Location:  
View from Wooster Road  
looking North

City or Village:  
Rockport

Landscape Zone:  
Urban Residential

Elevation:  
658.871

Project Visible:  
No

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 43

Location:  
View from Rocky River  
looking North

City or Village:  
Rocky River  
Landscape Zone:  
Urban Residential

Elevation:  
685.09

Project Visible:  
No



### Viewpoint 44

Location:  
View from Stinchcomb-  
Groth Memorial Scenic  
Overlook looking North

City or Village:  
Cleveland

Landscape Zone:  
Park

Elevation:  
731.216

Project Visible:  
No

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 45

**Location:**  
View from Globe Machine  
and Stamping Company,  
Battery Park looking North  
Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Urban Residential

**Elevation:**  
641.512

**Project Visible:**  
Yes



### Viewpoint 46

**Location:**  
View from West 73rd  
Street looking North  
Northeast

**City or Village:**  
Cleveland

**Landscape Zone:**  
Urban Residential

**Elevation:**  
641.785

**Project Visible:**  
No

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



**Viewpoint 47**

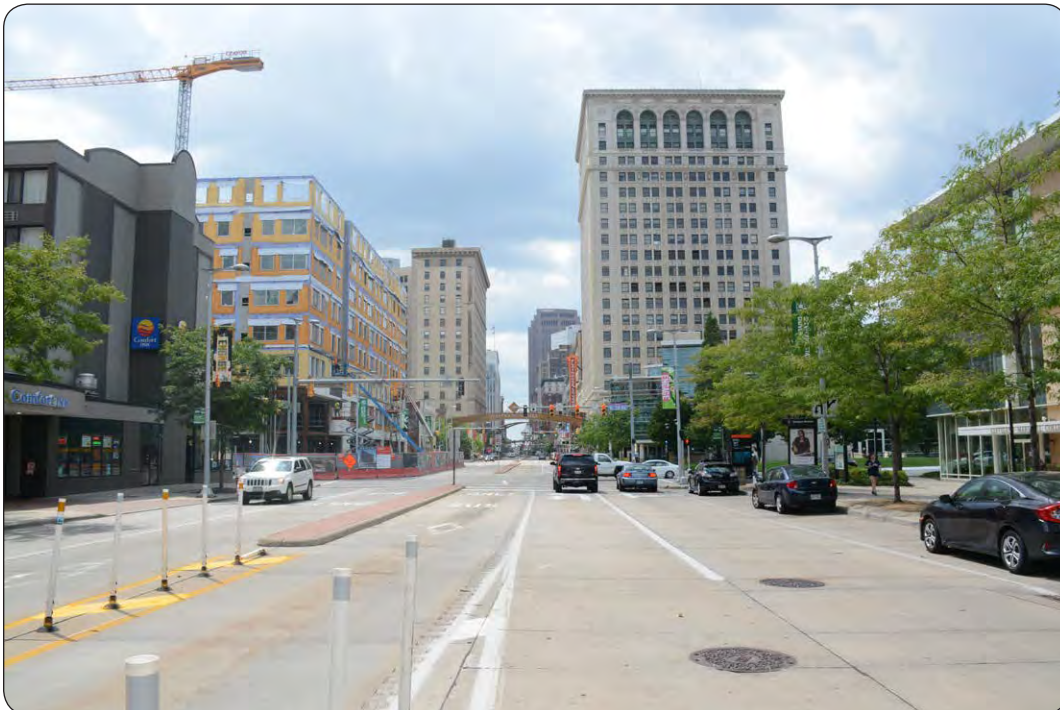
**Location:**  
View from East 9th Street  
looking North

**City or Village:**  
Cleveland

**Landscape Zone:**  
Urban

**Elevation:**  
646.263

**Project Visible:**  
No



**Viewpoint 48**

**Location:**  
View from Euclid Avenue  
Historic District looking  
West

**City or Village:**  
Cleveland

**Landscape Zone:**  
Urban

**Elevation:**  
661.377

**Project Visible:**  
No

**Project Icebreaker**

City of Cleveland - Cuyahoga County, Ohio

**Viewpoint Photographs**

January 2017





**Viewpoint 49**

**Location:**  
View from Prospect  
Avenue Row House  
Group looking Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Urban

**Elevation:**  
667.096

**Project Visible:**  
No



**Viewpoint 50**

**Location:**  
View from Euclid Avenue  
Historic District (Rockwell  
and Ontario Streets)  
looking North

**City or Village:**  
Cleveland

**Landscape Zone:**  
Urban

**Elevation:**  
652.66

**Project Visible:**  
No

**Project Icebreaker**

City of Cleveland - Cuyahoga County, Ohio

**Viewpoint Photographs**

January 2017





### Viewpoint 51

**Location:**  
View from Cleveland  
Public Square (Soldiers  
and Sailors Monument)  
looking North

**City or Village:**  
Cleveland

**Landscape Zone:**  
Urban

**Elevation:**  
655.051

**Project Visible:**  
No



### Viewpoint 52

**Location:**  
View from U.S. Coast  
Guard Cleveland Harbor  
Station looking North  
Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Industrial

**Elevation:**  
571.213

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



### Viewpoint 53

**Location:**  
View from U.S. Coast  
Guard Cleveland Harbor  
Station looking North  
Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Industrial

**Elevation:**  
572.38

**Project Visible:**  
Yes



### Viewpoint 54

**Location:**  
View from U.S. Coast  
Guard Cleveland Harbor  
Station looking North  
Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Industrial

**Elevation:**  
595.429

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017





### Viewpoint 55

**Location:**  
View from Bratenahl Road  
looking Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Residential

**Elevation:**  
618.623

**Project Visible:**  
No



### Viewpoint 56

**Location:**  
View from Cleveland  
Lakefront State Park  
Bridge Overpass looking  
Northwest

**City or Village:**  
Cleveland

**Landscape Zone:**  
Waterfront Park

**Elevation:**  
614.917

**Project Visible:**  
Yes

## Project Icebreaker

City of Cleveland - Cuyahoga County, Ohio

### Viewpoint Photographs

January 2017



## **Appendix C**

Digital Simulations  
(See Enclosed CD)

## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 12:44 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Edgewater Park Bluff

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 8, View North Northwest from Edgewater Park Bluff, Original Photograph

January 2017





## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 12:44 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North Northwest

Location: Edgewater Park Bluff

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 8, View North Northwest from Edgewater Park Bluff, Simulation

January 2017

Sheet 2 of 26





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 3:58 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North

Location: Lakewood Park (John Honam House)

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 12, View North from Lakewood Park (John Honam House), Original Photograph

January 2017





## Simulation



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 3:58 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North

Location: Lakewood Park (John Honam House)

### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 12, View North from Lakewood Park (John Honam House), Simulation

January 2017





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 5:25 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North

Location: Rocky River Park Overlook Platform

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 14, View North from Rocky River Park Overlook Platform, Original Photograph

January 2017

Sheet 5 of 26



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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 5:25 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North

Location: Rocky River Park Overlook Platform

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 14, View North from Rocky River Park Overlook Platform, Simulation

January 2017





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 4, 2016

Time: 9:02 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northeast

Location: Lakeview Drive

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 37, View North Northeast from Lakeview Drive, Original Photograph

January 2017





## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 4, 2016

Time: 9:02 AM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North Northeast

Location: Lakeview Drive

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 37, View North Northeast from Lakeview Drive, Simulation

January 2017





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 10:28 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: Northwest

Location: Cleveland Lakefront Nature Preserve

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 4, View Northwest from Cleveland Lakefront Nature Preserve, Original Photograph

January 2017

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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 10:28 AM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: Northwest

Location: Cleveland Lakefront Nature Preserve

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 4, View Northwest from Cleveland Lakefront Nature Preserve, Simulation

January 2017

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 12:12 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: Northwest

Location: USS COD (Submarine)

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 7, View Northwest from USS COD (Submarine), Original Photograph

January 2017

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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 12:12 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: Northwest

Location: USS COD (Submarine)

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 7, View Northwest from USS COD (Submarine), Simulation

January 2017

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 4, 2016

Time: 10:43 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North

Location: Upper Edgewater Drive

Overlook

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 25, View North from Upper Edgewater Drive Overlook, Original Photograph

January 2017

Sheet 13 of 26





## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 4, 2016

Time: 10:43 AM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North

Location: Upper Edgewater Drive  
Overlook

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 25, View North from Upper Edgewater Drive Overlook, Simulation

January 2017





## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 17, 2016

Time: 9:11 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D7100

Sensor Dimensions: 35 mm

Lens Focal Length: 32.6 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: U.S. Coast Guard Cleveland Harbor Station

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 52, View North Northwest from U.S. Coast Guard Cleveland Harbor Station, Original Photograph

January 2017

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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 17, 2016

Time: 9:11 AM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D7100

Sensor Dimensions: 35 mm

Lens Focal Length: 32.6 mm

Camera Height: 5'

#### View Location

Orientation: North Northwest

Location: U.S. Coast Guard Cleveland Harbor Station

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 52, View North Northwest from U.S. Coast Guard Cleveland Harbor Station, Simulation

January 2017

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 1:13 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Edgewater Park Beach

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 9, View North Northwest from Edgewater Park Beach, Original Photograph

January 2017

Sheet 17 of 26





## Simulation



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 1:13 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Edgewater Park Beach

### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 9, View North Northwest from Edgewater Park Beach, Simulation

January 2017

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 8:25 AM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: Northeast

Location: Cahoon Memorial Park Boat Launch

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 2, View Northeast from Cahoon Memorial Park Boat Launch, Original Photograph

January 2017

Sheet 19 of 26





## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 8:25 AM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: Northeast

Location: Cahoon Memorial Park Boat Launch

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 2, View Northeast from Cahoon Memorial Park Boat Launch, Simulation

January 2017

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 7:37 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: Northwest

Location: Bicentennial Park

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 19, View Northwest from Bicentennial Park, Original Photograph

January 2017

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## Simulation



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 7:37 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: Northwest

Location: Bicentennial Park

### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP  
digital LiDAR

## Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 19, View Northwest from Bicentennial Park, Simulation

January 2017

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 3, 2016

Time: 6:43 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Cleveland Mall

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 17, View North Northwest from Cleveland Mall, Original Photograph

January 2017

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## Simulation



### Simulation Information

#### Photograph Data

Date Taken: August 3, 2016

Time: 6:43 PM

Weather: Sunny and Clear

#### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

#### View Location

Orientation: North Northwest

Location: Cleveland Mall

#### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

#### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

#### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop

CC: Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 17, View North Northwest from Cleveland Mall, Simulation

January 2017

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## Original Photograph



## Simulation Information

### Photograph Data

Date Taken: August 4, 2016

Time: 2:07 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Euclid Avenue Historic District. Elevated View from Key Building

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 28, View North Northwest from Euclid Avenue Historic District. Elevated View from Key Building, Original Photograph

January 2017

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## Simulation



## Simulation Information

### Photograph Data

Date Taken: August 4, 2016

Time: 2:07 PM

Weather: Sunny and Clear

### Camera Information

Camera Make/Model: Nikon D810

Sensor Dimensions: 35 mm

Lens Focal Length: 50.0 mm

Camera Height: 5'

### View Location

Orientation: North Northwest

Location: Euclid Avenue Historic District. Elevated View from Key Building

### Structure Information

Model: Vestas V126 3.45 MW

Hub Height: 83 meters

Rotor Diameter: 126 meters

Overall Turbine Height: 146 meters

### Visual Simulation Notes

1. Visual Simulation is based on GIS data available at the time from Cuyahoga County, Ohio. Data is only as accurate as the original source and is not guaranteed by EDR.
2. This simulation depicts turbines relative to the viewer position, and considers the effects of refraction and curvature of the earth.

### Technical Information

Software: AutoCad; 3ds Max; Adobe Photoshop  
CC; Digital elevation data source: 2006 OSIP digital LiDAR

### Icebreaker Wind

Lake Erie, City of Cleveland - Cuyahoga County, Ohio

Appendix C: Viewpoint 28, View North Northwest from Euclid Avenue Historic District. Elevated View from Key Building, Simulation

January 2017

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