Marble River Wind Farm
Airspace Constraints Study

Prepared for
Horizon Wind Energy LLC

Report prepared by

Mead & Hunt

www.meadhunt.com

September 9, 2010 **FINAL**

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Military Operating Area (MOA)			
DOD/DHS Long Range Radar			
NOAA NEXRAD Radar			
FAA Enroute (Victor Routes)			
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Airport Departures			
Private Airports			
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Impacts Description

- No impacts to military airspace operations are anticipated.
- A large portion of the site has been identified as potentially interfering with Air Defense and Homeland Security long range radars and weather radar operations. **It is recommended that you file a FAA 7460-1 as early as possible to address the potential radar conflicts.**
- No impacts to civil airspace operations are anticipated.
- Microwave telecommunication paths pass through the site, see **Appendix A**.

Chapter 1 - Introduction

Purpose

Horizon Wind Energy LLC (Horizon) develops, constructs, owns and operates wind farms within various regions of the United States. As of 2009, Horizon has developed more than 3,400 megawatts (MW) and operates more than 2,800 MW of wind farms.

Horizon is proposing a new wind farm in northern New York and has contracted with Mead & Hunt Inc. as an expert on airspace study. The purpose of this study is to evaluate the airspace constraints and impacts on the sites to provide due diligence for evaluating this site as a suitable location for future development.

Description

The proposed Marble River Wind Farm is located in Clinton County, on the border between the United States and Canada (**Exhibit 1.1**). The area would be best described as farmland with intermittent forest (**Exhibit 1.2**).

The elevation of the site ranges from 900 feet Mean Sea Level (MSL) to 1,660 feet MSL. **Exhibit 1.3** defines the coordinates of the boundary of wind farm sites.

Exhibit 1.1 Regional Map

Exhibit 1.2 Location Map

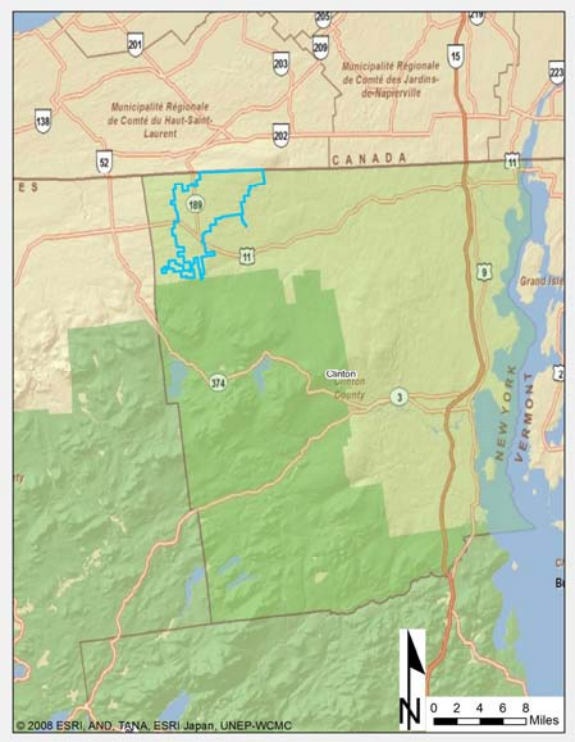

Exhibit 1.3 Boundary Coordinates

LONGITUDE	LATITUDE
44° 59' 58.084" N	73° 55' 33.374" W
45° 0' 9.934" N	73° 48' 48.248" W
44° 59' 6.239" N	73° 48' 37.138" W
44° 59' 0.314" N	73° 49' 33.426" W
44° 58' 55.871" N	73° 49' 34.908" W
44° 58' 52.167" N	73° 50' 11.939" W
44° 58' 36.614" N	73° 50' 9.717" W
44° 58' 35.133" N	73° 50' 20.827" W
44° 58' 11.433" N	73° 50' 17.124" W
44° 58' 8.470" N	73° 50' 49.712" W
44° 57' 42.548" N	73° 50' 44.527" W
44° 57' 39.585" N	73° 51' 8.227" W
44° 56' 47.741" N	73° 50' 57.118" W
44° 56' 46.260" N	73° 51' 5.265" W
44° 56' 13.672" N	73° 50' 57.118" W
44° 55' 55.156" N	73° 50' 37.121" W
44° 55' 49.972" N	73° 50' 34.899" W
44° 56' 7.747" N	73° 50' 54.155" W
44° 56' 21.819" N	73° 51' 3.043" W
44° 56' 47.000" N	73° 51' 7.487" W
44° 56' 33.669" N	73° 53' 15.616" W
44° 56' 28.485" N	73° 53' 15.616" W
44° 56' 25.522" N	73° 53' 52.648" W
44° 56' 1.081" N	73° 53' 47.464" W
44° 55' 57.378" N	73° 54' 25.977" W
44° 55' 29.234" N	73° 54' 23.014" W
44° 55' 27.012" N	73° 55' 0.786" W
44° 55' 19.606" N	73° 55' 0.786" W
44° 55' 18.124" N	73° 55' 13.377" W
44° 54' 53.683" N	73° 55' 9.674" W
44° 54' 51.462" N	73° 55' 16.340" W
44° 54' 42.574" N	73° 55' 18.562" W
44° 54' 34.427" N	73° 55' 4.490" W
44° 53' 51.470" N	73° 54' 55.602" W
44° 53' 55.914" N	73° 54' 2.276" W
44° 53' 42.583" N	73° 53' 58.573" W
44° 53' 33.695" N	73° 55' 23.746" W
44° 52' 16.669" N	73° 55' 4.490" W
44° 52' 15.188" N	73° 55' 20.043" W
44° 51' 54.450" N	73° 55' 15.599" W
44° 51' 52.969" N	73° 55' 25.968" W
44° 52' 40.369" N	73° 55' 35.596" W
44° 52' 38.888" N	73° 55' 40.040" W
44° 53' 30.732" N	73° 55' 49.668" W
44° 53' 27.770" N	73° 56' 11.887" W
44° 53' 6.292" N	73° 56' 7.443" W
44° 53' 5.551" N	73° 56' 17.812" W
44° 52' 58.145" N	73° 56' 17.072" W
44° 52' 58.145" N	73° 56' 25.959" W
44° 52' 35.185" N	73° 56' 21.516" W
44° 52' 35.185" N	73° 56' 14.850" W
44° 52' 0.375" N	73° 56' 8.925" W
44° 51' 58.153" N	73° 56' 24.478" W
44° 52' 1.116" N	73° 56' 26.700" W
44° 51' 58.894" N	73° 57' 0.028" W
44° 52' 6.300" N	73° 56' 57.807" W
44° 52' 2.597" N	73° 57' 32.616" W
44° 52' 30.000" N	73° 57' 36.320" W
44° 52' 27.038" N	73° 58' 22.239" W
44° 52' 33.704" N	73° 58' 22.979" W

44° 52' 33.704" N	73° 58' 20.017" W
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44° 52' 40.369" N	73° 58' 24.461" W
44° 52' 42.591" N	73° 58' 25.201" W
44° 52' 40.369" N	73° 59' 8.158" W
44° 52' 23.335" N	73° 59' 8.158" W
44° 52' 23.335" N	73° 59' 34.821" W
44° 52' 41.110" N	73° 59' 37.043" W
44° 52' 41.851" N	73° 59' 22.971" W
44° 52' 48.516" N	73° 59' 22.230" W
44° 52' 49.998" N	73° 59' 8.158" W
44° 52' 50.738" N	73° 58' 50.383" W
44° 53' 15.920" N	73° 58' 53.345" W
44° 53' 18.882" N	73° 58' 10.389" W
44° 53' 1.848" N	73° 58' 7.426" W
44° 53' 2.588" N	73° 57' 48.170" W
44° 52' 54.441" N	73° 57' 45.948" W
44° 52' 56.663" N	73° 57' 21.507" W
44° 52' 31.482" N	73° 57' 19.285" W
44° 52' 34.444" N	73° 56' 45.216" W
44° 52' 28.519" N	73° 56' 42.994" W
44° 52' 27.779" N	73° 56' 31.884" W
44° 53' 10.735" N	73° 56' 37.069" W
44° 53' 7.773" N	73° 57' 13.360" W
44° 53' 23.326" N	73° 57' 14.841" W
44° 53' 24.067" N	73° 57' 14.101" W
44° 53' 38.879" N	73° 57' 17.063" W
44° 53' 35.917" N	73° 57' 51.873" W
44° 53' 55.914" N	73° 57' 54.835" W
44° 53' 56.655" N	73° 57' 12.619" W
44° 54' 18.874" N	73° 57' 16.322" W
44° 54' 16.652" N	73° 57' 49.651" W
44° 54' 21.836" N	73° 57' 52.613" W
44° 54' 21.096" N	73° 58' 0.020" W
44° 55' 12.940" N	73° 58' 8.907" W
44° 55' 11.459" N	73° 58' 25.942" W
44° 55' 44.047" N	73° 58' 30.386" W
44° 55' 46.268" N	73° 58' 13.351" W
44° 56' 12.191" N	73° 58' 17.795" W
44° 56' 14.412" N	73° 57' 48.170" W
44° 56' 55.888" N	73° 57' 54.095" W
44° 56' 56.629" N	73° 57' 56.317" W
44° 57' 5.516" N	73° 58' 6.685" W
44° 57' 34.401" N	73° 58' 12.611" W
44° 57' 32.920" N	73° 58' 32.608" W
44° 57' 46.992" N	73° 58' 34.830" W
44° 57' 51.435" N	73° 58' 9.648" W
44° 58' 41.799" N	73° 58' 20.758" W
44° 58' 44.020" N	73° 58' 5.204" W
44° 59' 6.239" N	73° 58' 8.907" W
44° 59' 4.018" N	73° 57' 49.651" W
44° 59' 6.980" N	73° 57' 24.469" W
44° 58' 32.170" N	73° 57' 18.544" W
44° 58' 35.874" N	73° 56' 44.475" W
44° 58' 58.093" N	73° 56' 48.178" W
44° 58' 58.833" N	73° 56' 28.181" W
44° 59' 4.758" N	73° 56' 28.181" W
44° 59' 8.461" N	73° 56' 11.147" W
44° 58' 54.389" N	73° 56' 8.925" W
44° 58' 56.611" N	73° 55' 47.446" W
44° 59' 24.015" N	73° 55' 51.890" W
44° 59' 26.977" N	73° 55' 26.709" W

Chapter 2 - FAA/Military Airspace

Federal Aviation Administration Regions

The FAA is divided into regions. They are:

- Alaska Region includes Alaska.
- Central Region includes Iowa, Kansas, Missouri, and Nebraska.
- Eastern Region includes Delaware, Maryland, New Jersey, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia.
- Great Lakes Region includes Illinois, Indiana, Michigan, Minnesota, North Dakota, Ohio and South Dakota.
- New England Region includes Connecticut, Maine, Massachusetts, New Hampshire and Vermont.
- Northwest Mountain Region includes Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming.
- Southern Region includes Alabama, Florida, Georgia, Kentucky, North Carolina, and South Carolina, Puerto Rico and the Virgin Islands.
- Southwestern Region includes Arkansas, Louisiana, Oklahoma, New Mexico and Texas.
- Western Pacific Region includes Arizona, California, Hawaii and Nevada.

Federal Aviation Administration Airspace Definitions

FAA Orders and Advisory Circulars are publications produced by the FAA for purposes of documenting standards and procedures. Advisory Circulars document standard practices that are generally applicable and are widely distributed. Orders are similar, but function primarily as internal FAA policy and review procedures. Orders may not be distributed widely outside of FAA.

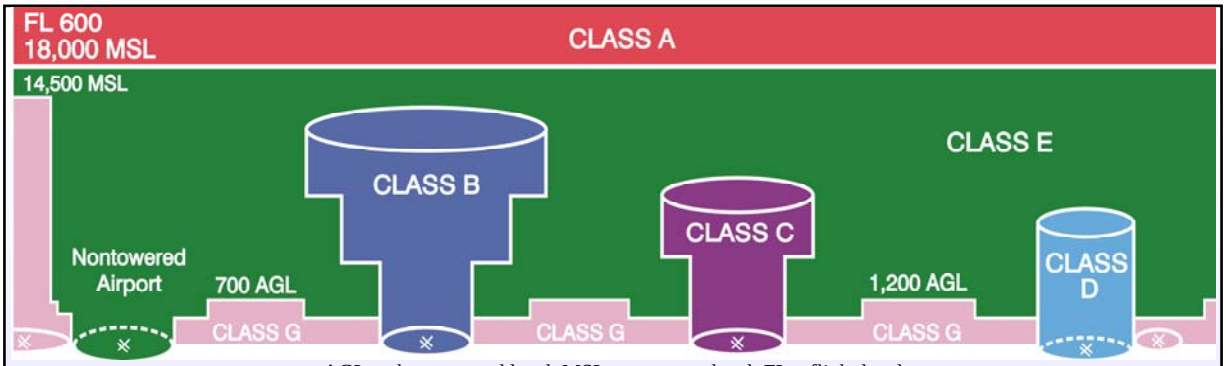
- **Visual Flight Rules (VFR)** are regulations under which a pilot operates an aircraft using visual references outside the aircraft for navigation, attitude control, and collision avoidance. VFR flight must be conducted in visual meteorological conditions that specify distance from clouds and in-flight visibility according to the type of airspace.

- **Instrument Flight Rules (IFR)** are regulations whereby navigation, attitude control, and collision avoidance are maintained primarily with reference to aircraft instruments. Separation with other aircraft is provided by Air Traffic Control (ATC). IFR flight may be conducted in either visual or instrument meteorological conditions. Generally speaking, navigation is conducted from point to point, called waypoints or fixes, usually along published routes that guarantee obstacle clearance and radio reception. This report emphasizes IFR flight and potential impacts to existing publications and procedures.

Controlled and Uncontrolled Airspace

- **Controlled airspace** is a generic category that includes all airspace in which air traffic control services (e.g., radar separation) are applied. Over most of the United States, airspace is controlled from a floor of 700 feet above ground level (AGL) to 1,200 feet AGL to 60,000 feet AGL. Controlled airspace is broken

Exhibit 2.1 Airspace Classifications



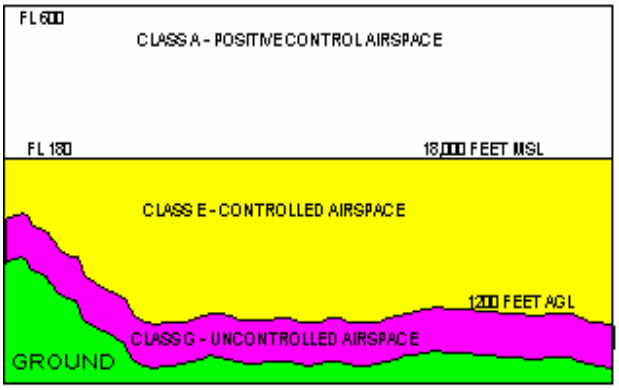
AGL – above ground level, MSL – mean sea level, FL – flight level

Airspace Classes	Communications	Entry Requirements	Separation	Special VFR in Surface Area
A	Required	ATC clearance	All	N/A
B	Required	ATC clearance	All	Yes
C	Required	Two-way communications prior to entry	VFR/IFR	Yes
D	Required	Two-way communications prior to entry	Runway operations	Yes
E	Not required for VFR	None for VFR	None for VFR	Yes
G	Not required	None	None	N/A

down into five alpha-numeric classifications A through E (**Exhibit 2.1**).

- **Uncontrolled airspace (Class G)** describes airspace where, mostly for practical reasons (e.g., below/outside radar coverage or radio reception), air traffic control services are not guaranteed for aircraft separation. Below 1,200 feet AGL or 700 feet AGL, most airspace is uncontrolled (**Exhibit 2.2**).

Exhibit 2.2 Major Airspace Areas



- **United States Standards for Terminal Instrument Procedures (commonly TERPS)** currently references FAA Order 8260.3b (Volumes 1 through 5) and related orders maintained by the FAA's Flight Technologies & Procedures Division - Flight Procedure Standards Branch. TERPS standards, criteria, and policies establish the design of the IFR en route, approach, and departure procedures that link the various waypoints forming the national airspace system.

- **Obstacle Clearance Surface (OCS)** is a concept used by TERPS that applies imaginary surfaces below and to the sides of an IFR flight segment. The purpose of an OCS is to ensure aircraft have the minimum required obstacle clearance. Penetrations to these surfaces require an alteration to that flight segment's design (i.e., altitude or course) to avoid the object. An OCS may be flat (such as during the en route phase) or sloping (takeoff or landing). The size and shape of an OCS is often

associated with the type of navigation system (or systems) used to define that route segment.

- **Required Obstacle Clearance (ROC)** is a concept used by TERPS to establish the minimum vertical clearance between the aircraft and the OCS. If a proposed object were to penetrate an OCS, it would require a procedure change that would either raise or steepen the slope of the OCS, which in turn, would require an altitude adjustment along that segment of the procedure.

- **Departure Procedure (DP)** for purposes of this report is the TERPS criteria defined in FAA Order 8260.3b, Change 20, Volume 4. Departure procedures are often the most critical (i.e., lowest) TERPS surface in the vicinity of an airport. Unless an existing departure procedure already limits instrument departure operations, our study assumes a standard climb gradient of 200 feet/nautical mile (FT/NM) along the extended runway centerline to a height of 400 feet above the airport, and then continuing thereafter at 200 FT/NM in all directions. Although the OCS for departures is often the most restrictive clearance surface, aircraft have wider flexibility to climb at a faster rate, turn, and see and avoid than they do during an approach procedure.

- **Initial Climb Area (ICA)** is a TERPS OCS with a 40:1 sloping surface beginning at the end of the departing runway and proceeding outward and upward along the extended runway centerline for a distance of 2 NM. Only the ICA portion of a DP was evaluated in detail for this study.

- **Transition/feeder routes** are flight segments between the airport environment and the en route environment contained in the published instrument procedures for a particular airport. These segments are outside of standard instrument approach and departure segments. TERPS rules assess these flight segments similar to en route flight segments.

- **En route procedures** are those major segments of the national airspace system. For purposes of this evaluation, the en route structure considered only Federal, or Victor, Airways.

- **Federal (Victor) Airways** form the primary en route structure for navigation under IFR. Each federal airway is based on a centerline that extends from one navigational aid (or fix, or waypoint) to another. The OCS for a Federal Airway is typically flat and includes the airspace within 4 NM each side of the segment's centerline. An additional 2 NM transitional buffer slopes upward along each side of the primary OCS. The airspace of a federal airway has a floor of 1,200 feet AGL (2,000 feet in designated mountainous regions). The en route ROC is 1,000 feet, meaning any proposed structure greater than 200 feet in height could require a change to the minimum enroute altitude published for that section.

- **Minimum Enroute Altitude (MEA)** is the lowest published altitude along a Federal airway that assures acceptable navigational signal coverage and meets obstacle clearance requirements between those fixes.

- **Minimum Obstacle Clearance Altitude (MOCA)** is the lowest published altitude along a Federal airway that meets obstacle clearance requirements. Navigational signal coverage is not guaranteed.

- **Minimum Vectoring Altitude (MVA)** is established for use by ATC when radar ATC is exercised. The minimum vectoring altitude provides 1,000 feet of clearance above the

highest obstacle in non-mountainous areas and 2,000 feet above the highest obstacle in designated mountainous areas.

- **Instrument Approach Procedure (IAP)** is a type of air navigation procedure that allows pilots to land an aircraft in reduced visibility, or to reach visual conditions permitting a visual landing. The publications depicting instrument approach procedures are called Terminal Procedures (TERPS) approach plates. TERPS breaks an IAP into the following segments each having a different size OCS and corresponding ROC value: initial approach segment, intermediate approach segment (normally), final approach segment (which normally includes visual landing), step-down fixes (occasionally), and a missed-approach segment. The missed-approach segment includes also includes three or more sub-segments. Approach plates often include transition/feeder routes between an enroute fix and an initial approach fix. Airports are particularly protective of any obstacle that might increase the published instrument approach minimums to each runway end or future extended runway end, thereby reducing operational utility.

- **Instrument Approach Minimums** are the lowest cloud ceiling and visibility authorized for a specific approach procedure. The last part of the approach and landing are normally performed visually. Instrument approach minimums are typically discussed as cloud ceiling height above airport (HAA) in feet and forward visibility in statute miles (SM). The lower the instrument approach minimums, the more accessible the airport is during inclement weather.

- **Notification Surfaces** are defined in CFR 14, Paragraph 77.13. They emanate outward and upward from each landing/takeoff surface (e.g., runway or heliport) and are shallower than the imaginary surfaces described above. Proposed objects penetrating these surfaces must submit FAA Form 7460-1 to evaluate possible impacts. Proposed objects that penetrate notification surfaces may not need to be charted unless they penetrate one or more imaginary surfaces of Paragraph 77.25.

- **Civil Airport Imaginary Surfaces** are defined in CFR 14, Paragraph 77.25. The primary purpose is to identify and chart obstacles that are close to a runway or heliport. Airports are also required by federal grant assurances (if they accept federal funding) to make reasonable efforts in keeping these surfaces free from additional obstacle penetrations. Objects penetrating one or more imaginary surfaces must be evaluated by the FAA to assess the hazard potential. The placement of an obstruction light on the top of a structure often provides sufficient mitigation, depending on the obstacle's location.

- **Runway End Siting Surfaces** are described in Appendix 2 of FAA AC 150/5300-13, *Airport Design.* These surfaces increase the awareness of the airport operator by requiring them to be included in the official Airport Layout Plan (ALP), the graphic depiction of future projects intended to receive federal aid. The size and slope of these surfaces are determined by aircraft size, approach speed, and type of operations (e.g., instrument, air carrier, departure, etc.). These surfaces extend outward and upward along the extended centerline form between 5,000 and 50,000 feet from each end with clearance surface slopes varying from 62.5:1 to 20:1.

- **Airspace Around Private Airports.** A Private-Use Airport can be any airport, airstrip, heliport, or helipad that is funded, owned, and operated by an individual, group, or company

accommodating only those operations authorized by the owner. Generally, these airports are not afforded federal airspace protections unless they have an FAA-approved instrument approach procedure. For purposes of conducting an initial due diligence safety screen, this report considers two levels of potential impacts. The most critical is an elliptical-shaped "red zone" that corresponds with the Part 77 "Horizontal Surface" used for close-in maneuvering that should be avoided to the extent practical or otherwise coordinated with the airport owner. A larger rectangular "yellow zone" is based on an unrestricted airport traffic pattern typical of a public-use airport. Fewer operational impacts are anticipated within the yellow area and most can be avoided or mitigated through early notification and discussion with the airport owner.

Special Use Airspace

A special use airspace (SUA) confines certain flight activities or restricts entry, or cautions other aircraft operating within specific boundaries. SUA areas are depicted on aeronautical charts. SUA areas are shown in their entirety, even when they overlap, adjoins, or when an area is designated within another area. The areas are identified by type and identifying number or name (R4001), effective altitudes, operating time, weather conditions (VFR/IFR) during which the area is in operation, and voice call of the controlling agency, on the back or front panels of the chart. SUA with a floor of 18,000 feet mean sea level (MSL) or above is not shown on the Enroute Low Altitude Charts. Similarly, SUA with a ceiling below 18,000 feet MSL is not shown on Enroute High Altitude Charts.

- ***L*** - ***Alert Area —*** An alert area is an airspace wherein a high volume of pilot training activities or an unusual type of aerial activity is conducted, neither of which is hazardous to aircraft. The purpose of alert areas is to advise nonparticipating pilots to be particularly alert when flying in these areas. All activities shall be conducted in accordance with applicable sections of Title 14 CFR, without waiver. Examples would be launch zones around Cape Canaveral.

- ***M - Military Operations Area —*** MOAs consist of non regulated airspace of defined vertical and lateral limits established for the purpose of separating certain military training activities from IFR traffic. The purpose of a MOA is to inform nonparticipating pilots that IFR traffic may be cleared through a MOA if IFR separation can be provided by ATC. Otherwise, ATC will reroute or restrict nonparticipating IFR traffic. Examples of activities conducted in MOAs include, but are not limited to: air combat tactics, air intercepts, aerobatics, formation training, and low-altitude tactics.

- ***P*** - ***Prohibited Area —*** A prohibited area is airspace established in 14 CFR part 73 provisions, within which no person may operate an aircraft without permission of the using agency. The purpose of a prohibited area is established when necessary to prohibit flight over an area on the surface in the interest of national security and welfare. They normally extend from the surface upward to a specified altitude, with a "continuous" time of designation. Examples of prohibited areas are the White House, nuclear power plants, or sensitive military areas.

- ***R*** - ***Restricted Area*** — A restricted area is airspace established in 14 CFR part 73 provisions, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. The purpose of restricted areas is

established when determined necessary to confine or segregate activities considered hazardous to nonparticipating aircraft. An example would be a live artillery firing range or missile launch area.

- ***W*** - ***Warning Area —*** A warning area is airspace of defined dimensions (extending from 3 NM outward from the coast of the United States), designated to contain activity that may be hazardous to nonparticipating aircraft. The purpose of a warning area is to warn nonparticipating pilots of the potential danger from activities being conducted. A warning area may be located over domestic waters, international waters, or both. An example would be naval warfare exercises or supersonic flight.

Other Airspace

- ***Military Training Route (MTR)*** — An MTR is a corridor of airspace of defined vertical and lateral dimensions established for conducting military flight training of low-altitude; high speed military flight training (generally below 10,000 feet MSL at airspeeds in excess of 250 knots indicated air speed (IAS). These routes are depicted in brown on Enroute Low Altitude Charts, and are not shown on inset charts or on IFR Enroute High Altitude Charts. Enroute Low Altitude Charts depict all IFR Military Training Route (IR) and VFR Military Training Route (VR) routes, except those VR's that are entirely at or below 1,500 feet AGL.

Military Training Routes are identified by designators (IR-107, VR-134) which are shown in brown on the route centerline. Arrows indicate the direction of flight along the route. The width of the route determines the width of the line that is plotted on the chart:

- **IR** - **Instrument Route —** An instrument route is airspace from near the surface up to 1,500 feet AGL or higher and is intended to be flown, to the maximum extent possible, under IFR or instrument mode. Instrument routes were created through a joint venture with the FAA and the Department of Defense (DoD). These routes have been mutually developed for the purpose of conducting low-altitude, high-speed military flight training. Non-participating aircraft are not prohibited, but must use extreme caution when in the vicinity of a route and contact the assigned FSS within 100 NM of the IR.

- **VR** - **Visual Route —** A visual route is airspace at near the surface up to 1,500 feet AGL and is generally intended to be flown under visual conditions or Visual Flight Rules (VFR). Visual routes were created through a joint venture with the FAA and the DoD. These routes have been mutually developed for the purpose of conducting low-altitude, high-speed military flight training. Non-participating aircraft are not prohibited, but must use extreme caution when in the vicinity of a route and contact the assigned FSS within 100 NM of the VR.

Route segments with a width of 5 NM or less, both sides of the center line are shown by a .02" line. Route segments with a width greater than 5 NM, either or both sides of the centerline, are shown by a .035" line.

Chapter 3 - Preliminary Military Airspace Evaluation

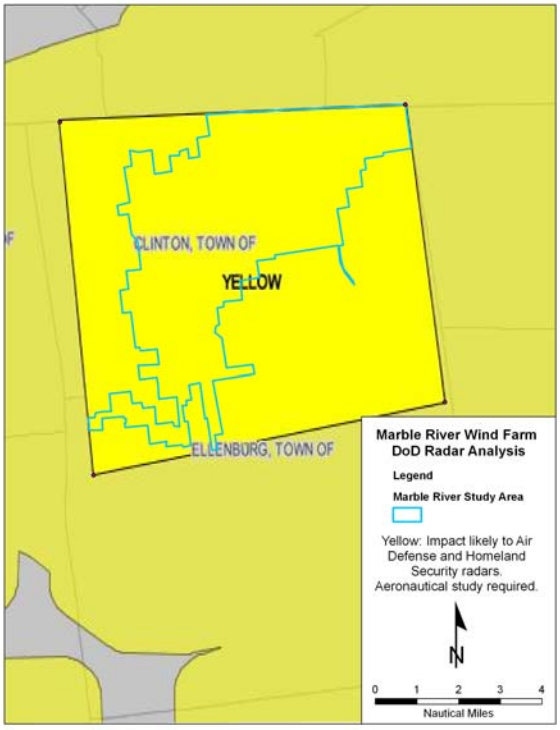
Military Environment

There are no impacts to military training routes or operations areas within the study boundary.

Military Airspace Conclusions

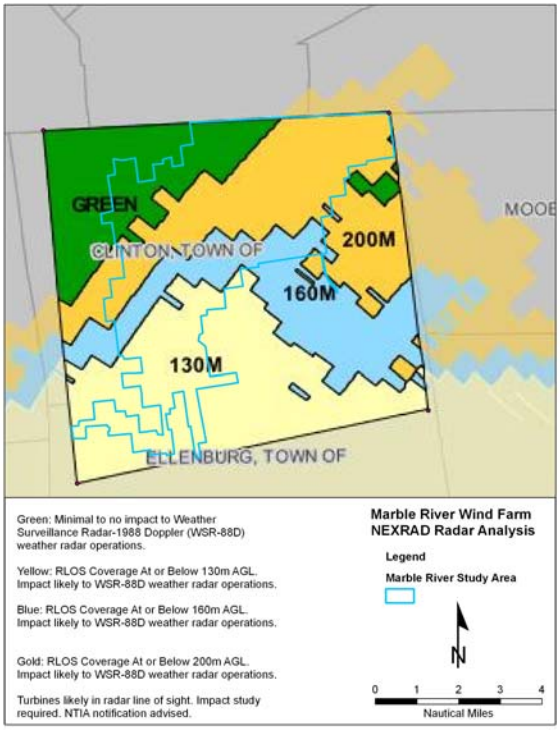
Due to the lack of military activity in the area, no impacts are anticipated.

All of the site may interfere with DoD/DHS long range radar. The entire site is shaded in yellow which indicates that impacts with the radar are likely. **It is recommended that Horizon file a FAA 7460-1 as early as possible to have DoD/DHS evaluate the radar impact of this site and provide definitive guidance on placement of the turbines.**



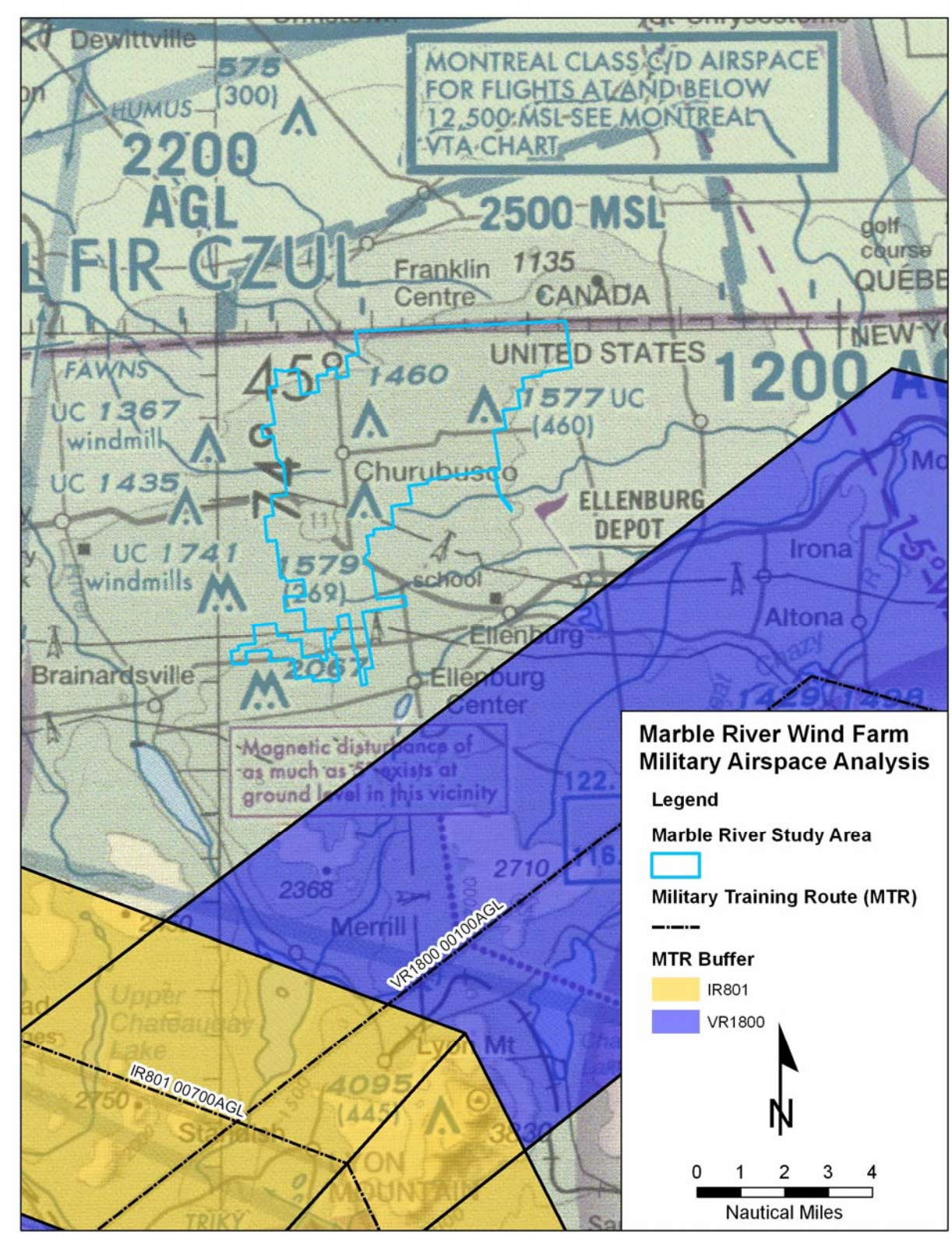
DoD/DHS Long Range Radar map from DOD Preliminary Screening Tool

The proposed wind turbines are 492 feet tall. The preliminary screen of the NEXRAD radar for the study area indicated that radar line of sight (RLOS) is at or below 646 feet for much of the study area. Impact to WSR-88D weather radar operations is likely. **Horizon is advised to file an FAA 7460-1 as early as possible. NOAA will evaluate this site for interference with the radar and advise Horizon of any conflicts and potential mitigation solutions.**



NEXRAD map from DOD Preliminary Screening Tool

Exhibit 3.1 Project Area Map



Chapter 4 - Preliminary Airspace Evaluation

Methodology, Assumptions, and Exclusions

This evaluation considers the entire site rather than specific turbine locations within the site. For evaluation purposes, proposed turbines are assumed to have a maximum height of 492 feet AGL. U.S. Geological Service topographic maps and data were obtained to evaluate topography. Mead & Hunt used airport and runway information from the FAA's Airport Facility Directory (valid 29 July to 23 September 2010), the online resource www.airnav.com for waypoint/fix and navigational aid locations, and FAA procedures publications (valid 29 July to 26 August 2010). A full-page graphic is included at the end of this chapter.

Airspace / Operational Overview

The proposed Marble River Wind Farm site is located in uncontrolled Class G airspace.

There is one publicly-owned airport within 20 NM of the proposed site. Malone-Dufort Airport (MAL), located 14 NM west of the proposed site, has two asphalt-surface runways (4,000 and 3,245 feet long). Malone-Dufort Airport has two published instrument approach procedures (IAPs) and one published departure procedure (DP). A review of FAA procedure production schedules reveals two new IAPs and two amendments to the existing DP scheduled for publication at Malone-Dufort Airport in April 2012.

Enroute Environment

There are no Victor Airways that overfly the proposed Marble River Wind Farm site.

There are two minimum vectoring altitude (MVA) sectors above the site associated with radar and air traffic control facilities at Burlington International Airport (BTV) in Burlington, Vermont. The MVA for the sector in the northeastern part of the site is 3,000 feet, and the maximum ground elevation in this area is approximately 1,230 feet MSL.

The MVA for the sector in the southwestern part of the site is 4,500 feet, and the maximum ground elevation in this area is approximately 1,660 feet MSL. The ROC for MVA sectors in this part of the country is 1,000 feet. The ROC for both MVA sectors clears all proposed 492-foot towers by at least 270 feet.

Feeder / Transition Routes

There currently are no published instrument approach feeder/transition routes which would be adversely impacted by the proposed 492-foot towers.

Instrument Approaches / Missed Approaches

There currently are no published instrument approach or missed approach procedures which would be adversely impacted by the proposed 492-foot towers.

Departures

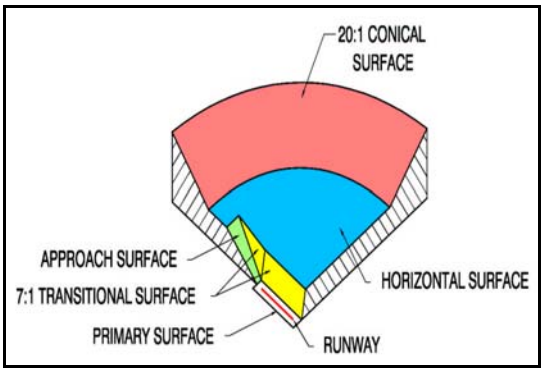
Departures from neighboring airports would not be adversely impacted by the proposed 492-foot towers.

CFR 14, Part 77, Civil Airport Imaginary Surfaces

The primary purpose of the imaginary surfaces, defined by Title 14 of the Code of Federal Regulations Part 77.25 and illustrated in **Exhibit 4.1**, is to identify and chart obstacles that are close to a runway or heliport. Airports are required by federal grant assurances (if they accept federal funding) to make reasonable efforts in keeping these surfaces free from new obstacle penetrations. None of the proposed 492-foot towers adversely impact the 77.25 surfaces at any public airport.

The primary purpose of the concentric surfaces defined by section 77.23(a)(2) is to determine obstructions in the vicinity of airports. Under this definition, any object that has a height 200 feet AGL or above the established airport elevation, whichever is higher, within 3 NM of the airport reference point (ARP) is deemed an obstruction. This height increases by 100 feet for each additional nautical mile of horizontal distance from the ARP, up to maximum of 500 feet. None of the proposed 492-foot towers adversely impact the 77.23(a)(2) surfaces at any public airport.

Exhibit 4.1 Typical FAR Part 77 Surfaces



Other Airport Clearance Surfaces and Considerations

The proposed Marble River Wind Farm site is clear of the design surfaces contained in FAA Advisory Circular 150/5300-13, *Airport Design*, for all nearby airports, including the runway protection zone (RPZ), object free area (OFA), object free zone (OFZ), runway safety area (RSA), runway end siting surfaces (TSS), and controller line-of-sight.

Private Airports

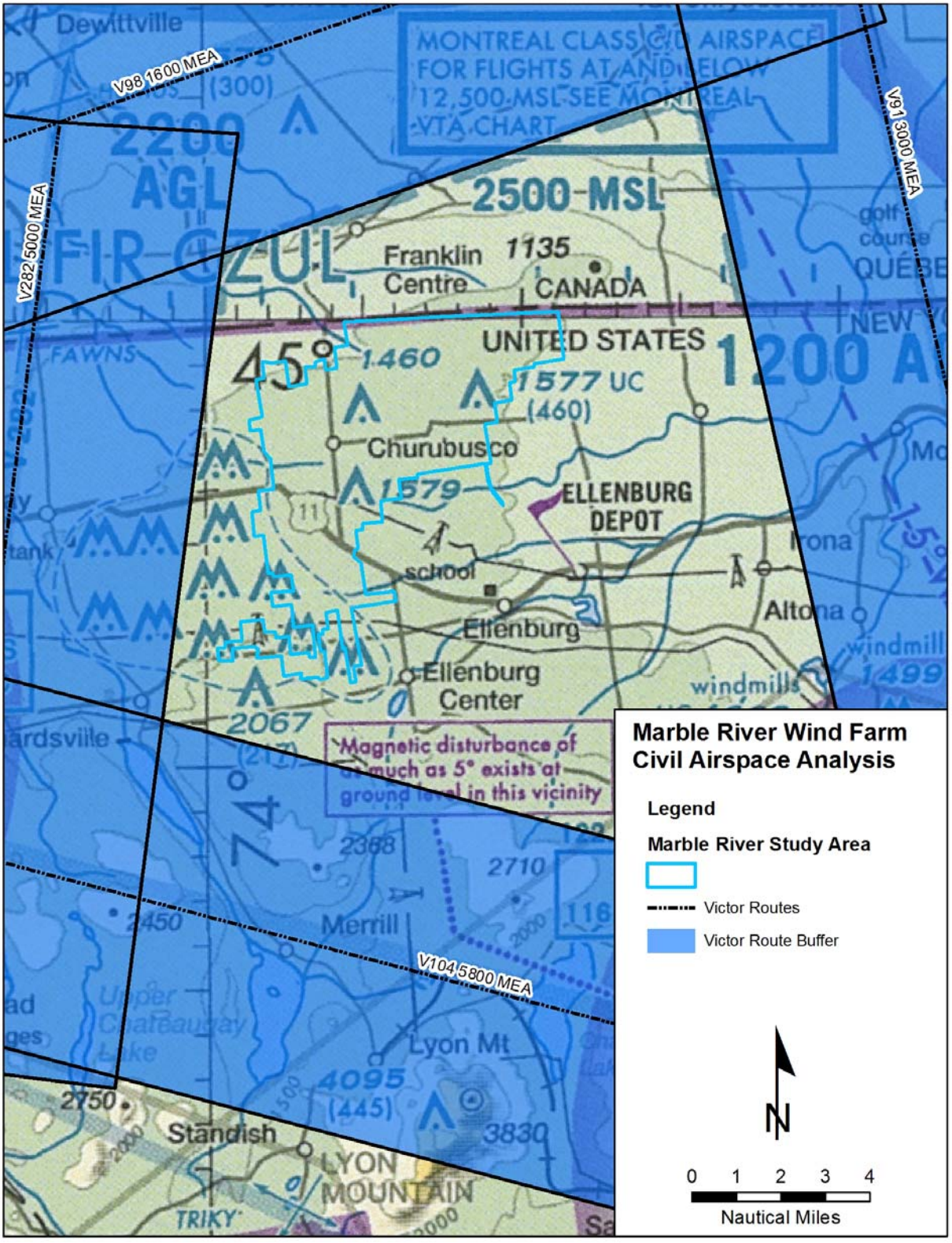
There are no private airports within 15 nautical miles of the site. It is expected that there will not be any impacts to private airports associated with the proposed 492-foot towers.

Airspace Conclusions

The proposed Marble River Wind Farm site would not impact any critical airspace surfaces associated with Malone-Dufort Airport. There are no Victor Airways or MVA sectors that would be impacted by the wind farm (**Exhibit 4.2)**, as the underlying control surfaces are clear, either laterally or vertically, of any proposed 492-foot tall towers. In summary, it is expected that there will be no civil aviation impacts associated with the proposed towers.

Each of the individual wind turbines to be erected will require a 7460-1 form be submitted to the FAA. The forms are to be submitted 30 days before construction begins or the date an application for a construction permit is filed, whichever is earlier. The FAA will indicate receipt of the form and the results of an initial screening. Typically, structures greater than 200 feet in height require marking and/or lighting.

Exhibit 4.2 FAA Airspace



Chapter 5 - Recommendations and Points of Contact

Recommended Procedure

The final step in the process is to submit FAA form 7460-1, Notice of Proposed Construction or Alteration as required by CFR Title 14 Part 77, *Objects Affecting Navigable Airspace*. Paragraph 77.13 requires the FAA be notified of any construction or alteration exceeding 200 feet above ground level. FAA notification is also required for shorter structures within 20,000 feet of a public-use or military airport. Notification includes four executed copies of FAA Form 7460-1 and related documentation/attachments. The materials are to be forwarded to the Manager, Flight Standards Division of the FAA Regional Office having jurisdiction over that site (contact information follows).

In the case of wind farm submissions, the FAA will initiate an *Aeronautical Study.* The study process will include circulation and review by various divisions of the FAA, DoD, and others having "a significant aeronautical interest" (e.g., airport sponsors, etc). Typically within ninety days, the FAA will issue one of the following form-letter determinations:

Determination of No Hazard (DNH) — The study did not reveal any substantial adverse effect and can proceed on that basis. The letter may include optional information such as the basis from which the conclusion was made, identification of obstruction standards exceeded, cautionary aeronautical/operational impacts (e.g., to VFR operations, traffic patterns, etc.), valid aeronautical comments received during circulation/review, marking/lighting requirements, petition deadlines, etc.

Notice of Presumed Hazard (NPH) — Indicates the proposed structure exceeds obstruction standards and/or will have an adverse effect on navigable airspace. The goal of the notice is to allow the proponent an opportunity to amend the proposal to avoid the impact. These letters normally require a response within 60 days of issuance. Once the deadline passes, the FAA assumes the project has been terminated. No further action will be taken unless the proponent submits a new 7460 submission to restart the process. Alternatively, a written response from the proponent before the deadline will result in either a new determination (e.g., DNH) or will require the FAA to undertake further study to determine adverse impacts.

Determination of Hazard (DOH) — This letter indicates that substantial adverse impact could not be eliminated during the negotiation period following the NPH and the affected aeronautical operations cannot be adjusted to accommodate the structure without substantial adverse effect.

Unless otherwise specified in the letter, DNH and DOH determinations are valid for a period of 18 months from the issue date. The letter will normally include a petition deadline 30 days following the issue/effective date. Unless a valid petition is filed, the determination becomes final 40 days following the issue/effective date.

Points of Contact

Federal Aviation Administration
Eastern Region – New York
Christopher D. Helbling
Manager, Albany Flight Standards District Office
7 Airport Park Blvd.
Latham, NY 12110
(518) 785-5660

US Air Force Regional
Environmental Coordinator

Eastern Region
60 Forsyth St. SW ST., Ste. 8M80
Atlanta, GA 30303-3416
Local: (404) 562-4205
Fax: (404) 562-4221
Toll Free: (888) 610-7419
afcee.ro-e.awag@brooks.af.mil

DoD/DHS Long Range Radar

Ken Kingsmore
Langley AFB, VA
Phone: (757)764-4392
Fax: (757)766-0256
Cell: (757)449-7222
Kenneth.kingsmore@langley.af.mil

NOAA Weather Radar

Major John Sandifer
120 David L. Boren Blvd.
Norman, OK 73072
Phone: (405) 325-2095
john.b.sandifer@noaa.gov

APPENDIX A

TELECOMMUNICATIONS SURVEY

Wind Power GeoPlanner™

Licensed Microwave Report

Marble River Wind Farm

Prepared on Behalf of
Mead & Hunt, Inc.

August 9, 2010

COMSEARCH
A CommScope Company

Table of Contents

1. Introduction

The use of wind energy, one of the oldest forms of harnessing a natural energy source, is now one of the world's fastest growing alternative energy sources. The United States is committed to the use of wind energy, and over the next several years billions of dollars will be spent on wind power projects. However, as new wind turbine generators are installed around the country, it is important to note that they may pose an interference threat to existing microwave systems and broadcast stations licensed to operate in the United States.

Wind turbines can interfere with microwave paths by physically blocking the line-of-sight between two microwave transmitters. Additionally, wind turbines have the potential to cause blockage and reflections ("ghosting") to television reception. Blockage is caused by the physical presence of the turbines between the television station and the reception points. Ghosting is caused by multipath interference that occurs when a broadcast signal reflects off of a large reflective object—in this case a wind turbine—and arrives at a television receiver delayed in time from the signal that arrives via direct path.

Many states and other jurisdictions recognize the need for regulations addressing interference to radio signal transmissions from the wind turbine installations. Specifically, local planning authorities typically require project developers to ensure wind turbines will not cause interference. In some cases they require developers to notify the telecommunication operators in the area of the proposed wind turbine installation. Other factors prompting developers to undertake proactive investigation into potential interference include the need to prevent legal and regulatory problems and the desire to promote goodwill within the community—a good neighbor approach.

Comsearch has developed and maintains comprehensive technical databases containing information on licensed microwave networks throughout the United States. Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). These systems are the telecommunication backbone of the country, providing long-distance and local telephone service, backhaul for cellular and personal communication service, data interconnects for mainframe computers and the Internet, network controls for utilities and railroads, and various video services.

This report focuses on the potential impact of wind turbines on licensed non-federal government microwave systems. Comsearch provides additional wind energy services, a description of which is available upon request.

2. Summary of Results

An overall summary of results appears below.

Project Information

Name: Marble River Wind Farm

County: Clinton

State: New York

Total Microwave Paths	Paths with Obstructions	Total Turbines	Turbine Obstructions
7	0	74	0

Methodology

Our obstruction analysis was performed using Comsearch's proprietary microwave database, which contains all non-government licensed paths from 0.9 - 23 GHz[1]. First, we determined all microwave paths that intersect the area of interest[2]. The area of interest was defined by the client and encompasses the planned turbine locations. Next, for each microwave path that intersected the project area, we calculated a Worst Case Fresnel Zone (WCFZ). The mid-point of a full microwave path is the location where the widest (or worst case) Fresnel zone occurs. Fresnel zones were calculated for each path using the following formula.

$$Rn \cong 17.3\sqrt{\frac{n}{F_{GHz}}\left(\frac{d_1 d_2}{d_1 + d_2}\right)}$$

Where,

R_n = Fresnel Zone radius at a specific point in the microwave path, meters
n = Fresnel Zone number, 1
F_{GHz} = Frequency of microwave system, GHz
d_1 = Distance from antenna 1 to a specific point in the microwave path, kilometers
d_2 = Distance from antenna 2 to a specific point in the microwave path, kilometers

For worst case Fresnel zone calculations, $d_1 = d_2$

[1] Please note that this analysis does not include unlicensed microwave paths or federal government paths that are not registered with the FCC.

[2] We use FCC-licensed coordinates to determine which paths intersect the area of interest. It is possible that as-built coordinates may differ slightly from those on the FCC license.

The calculated WCFZ radius, giving the linear path an area or swath, buffers each microwave path in the project area. See the Tables and Figures section for a summary of paths and WCFZ distances. In general, this is the two-dimensional area where the planned wind turbines should be avoided, if possible. A depiction of the WCFZ overlaid on topographic basemaps can be found in the Tables and Figures section, and is also included on the enclosed CD[3].

Discussion of Potential Obstructions

For this project, 74 turbines were considered in the analysis, each with a blade diameter of 100 meters and turbine hub height of 94 meters.

None of the turbines were found to have a potential conflict with the incumbent microwave paths

[3] The ESRI® shapefiles contained on the enclosed CD are in NAD 83 UTM Zone 18 projected coordinate system.

3. Tables and Figures

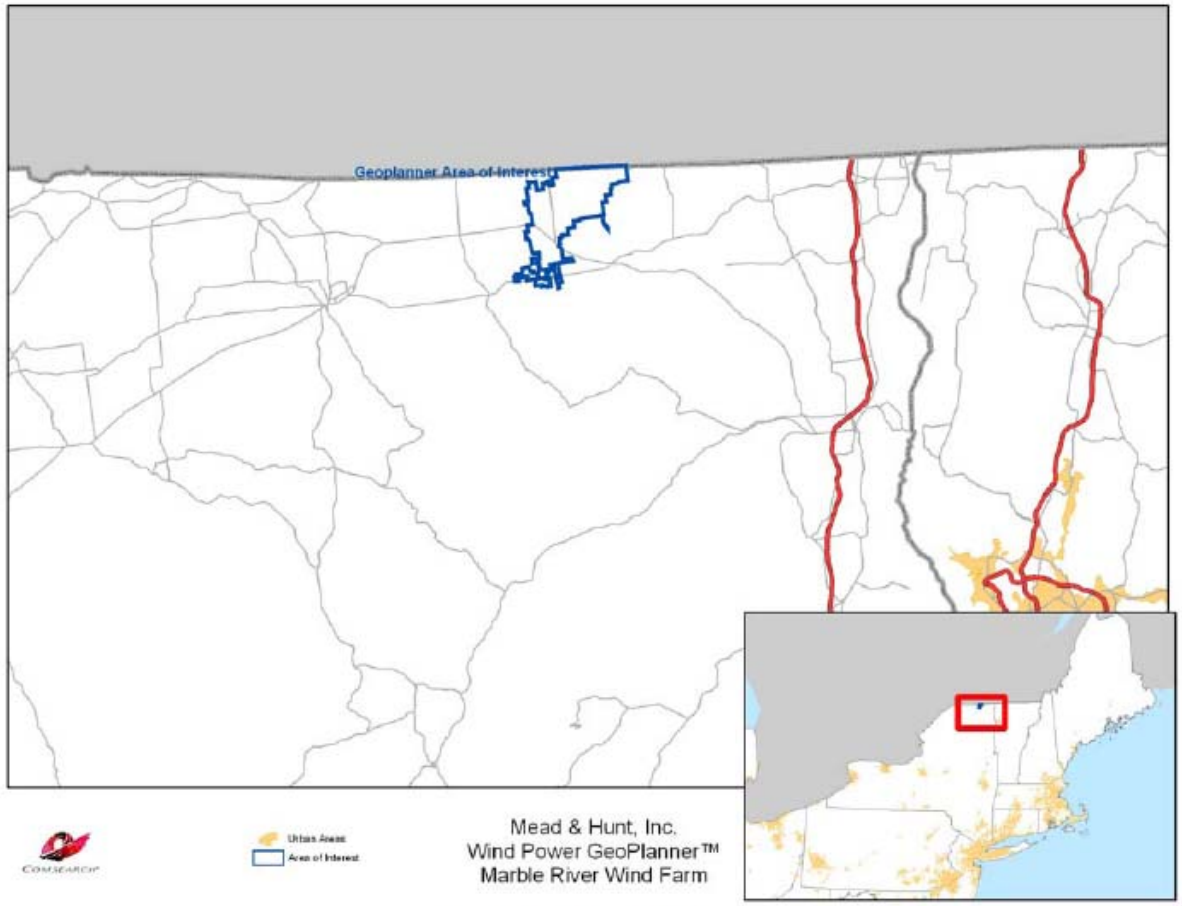


Figure 1: Area of Interest

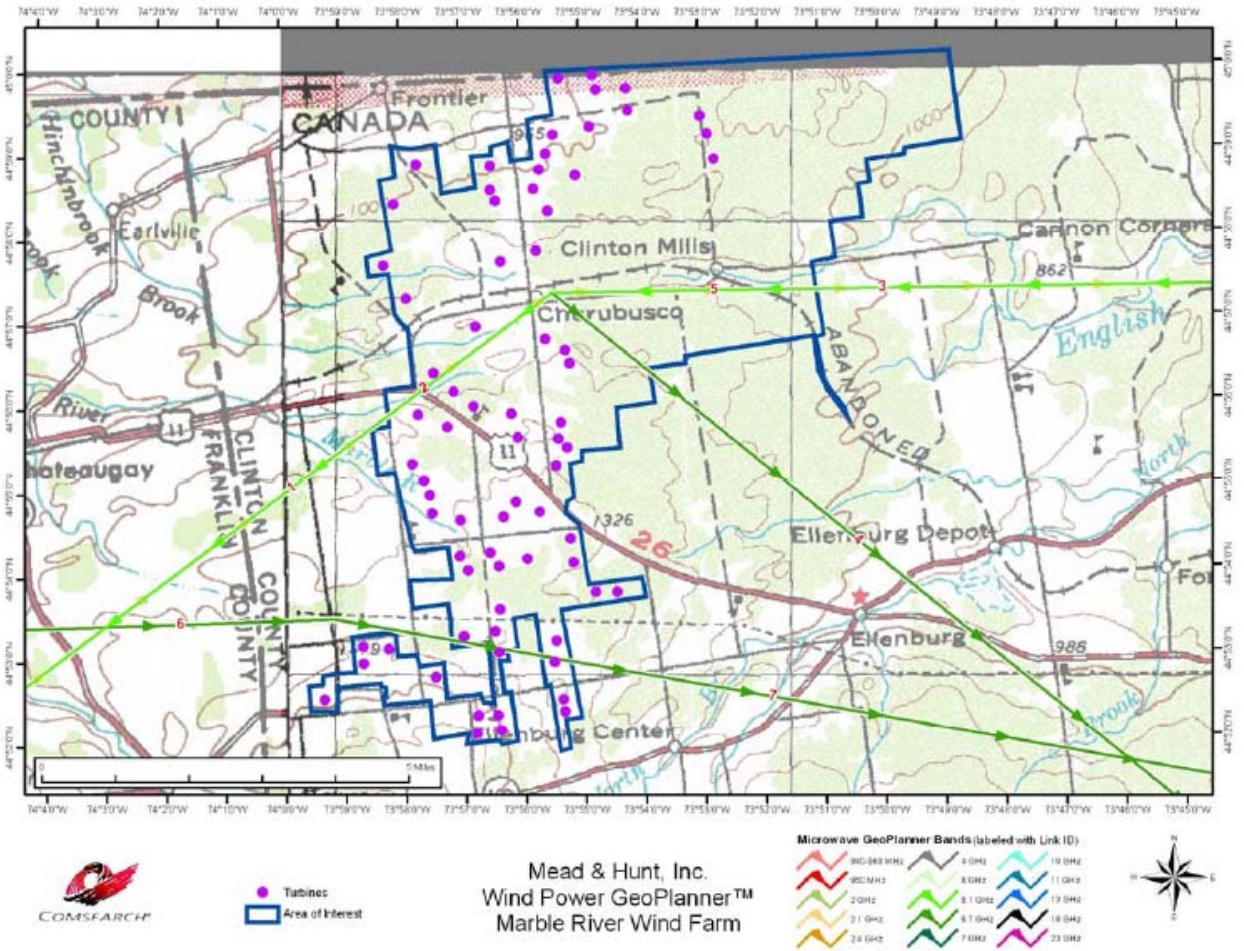


Figure 2: Microwave Paths that Intersect the Area of Interest

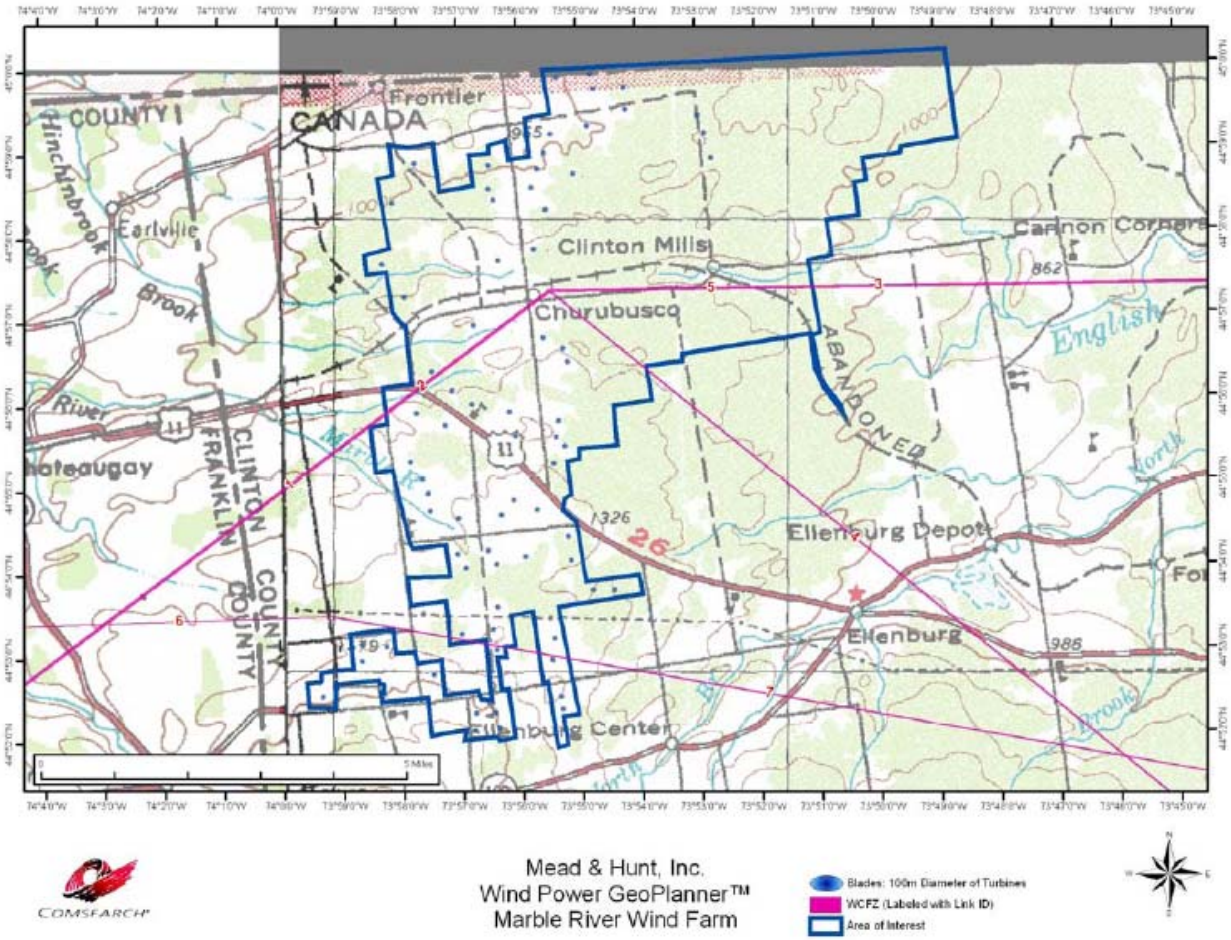


Figure 3: Microwave Paths with WCFZ Buffers

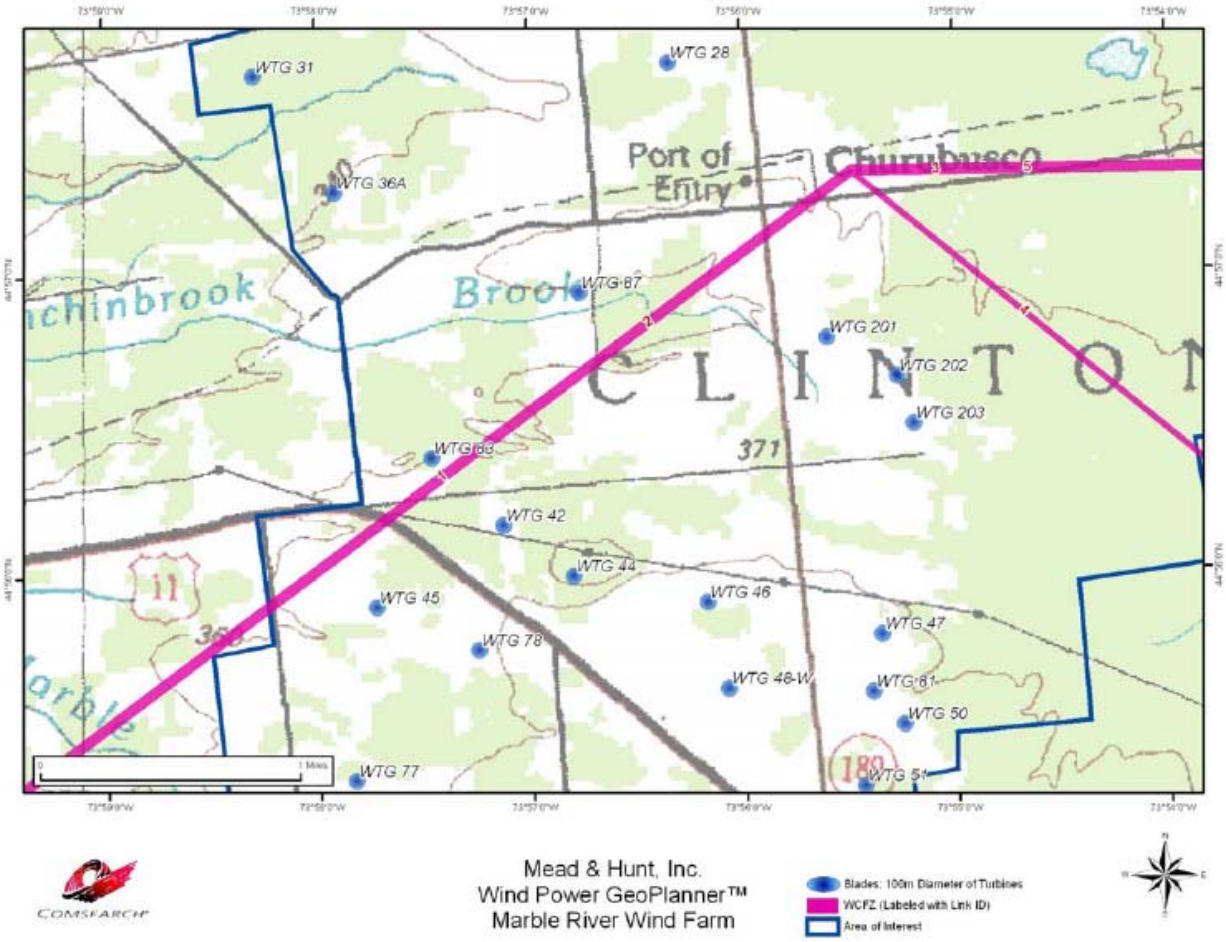


Figure 4: Microwave Paths with WCFZ Buffers (zoom)

ID	Site Name 1	Site Name 2	Callsign 1	Callsign 2	Band	Licensee	WCFZ (m)
1	MALONE	CHURUBUSCO	WMQ391	WMQ392	2.1 GHz	New Cingular Wireless PCS LLC-N NY,VT	34.75
2	CHURUBUSCO	MALONE	WMQ392	WMQ391	Lower 6 GHz	New Cingular Wireless PCS LLC-N NY,VT	20.48
3	CHURUBUSCO	CHAMPLAIN	WMQ392	WMQ393	2.1 GHz	New Cingular Wireless PCS LLC-N NY,VT	35.83
4	CHURUBUSCO	RAND	WMQ392	WQJH311	Upper 6 GHz	New Cingular Wireless PCS LLC-N NY,VT	18.93
5	CHAMPLAIN	CHURUBUSCO	WMQ393	WMQ392	Lower 6 GHz	New Cingular Wireless PCS LLC-N NY,VT	21.12
6	WILLIS	RYAN ROAD	WNEV804	WQGJ812	Upper 6 GHz	New York Power Authority	10.78
7	RYAN ROAD	BIG HILL	WQGJ812	WQGJ802	Upper 6 GHz	New York Power Authority	17.74

Table 1: Microwave Paths that Intersect the Area of Interest
(See enclosed mw_geopl.xls for more information and GP_dict_matrix_description.xls for detailed field descriptions)

4. Contact Us

For questions or information regarding the Licensed Microwave Report, contact:

Contact person:	Denise Finney
Title:	Account Manager
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5650
Fax:	703-726-5595
Email:	dfinney@comsearch.com
Web site:	www.comsearch.com

APPENDIX B

AM AND FM RADIO REPORT

Wind Power GeoPlanner™

AM and FM Radio Report

Marble River Wind Farm

Prepared on Behalf of
Mead & Hunt, Inc.

July 30, 2010

COMSEARCH
A CommScope Company

Table of Contents

1. Introduction

Comsearch was contracted by Mead & Hunt, Inc. to determine if there would be any degradation to the operational coverage of AM and FM Radio Broadcast Stations located in the vicinity of their proposed Marble River Wind Farm Project located in Clinton County, New York.

2. Summary of Results

AM Radio Analysis
Comsearch determined that there is one AM station within a 15 mile radius from the project center point, as shown in Table 1 and Figure 1.

No degradation of AM broadcast coverage should occur due to the presence of the wind turbines as long as the separation distance to the nearest wind turbine is greater than 2 miles. Potential problems with broadcast coverage are only anticipated when AM broadcast stations with directive antennas are within 2 miles of turbine towers and AM broadcast stations with non-directive antennas are within 0.5 miles.

Since WICY is located greater than 2 miles from the project area, no degradation of AM broadcast coverage should occur due to the Marble River Wind Farm.

ID	Call Sign	Status	Frequency (kHz)	Transmit ERP (kW)	City	ST	Distance from center of AOI (mi)
1	WICY	CP	1500	50	MOOERS	NY	15.0

Table 1: AM Radio Stations

Legend:

NY = New York
kHz = kilohertz
kW = kilowatt
CP = Construction Permit
mi = mile
ERP= transmit effective radiated power

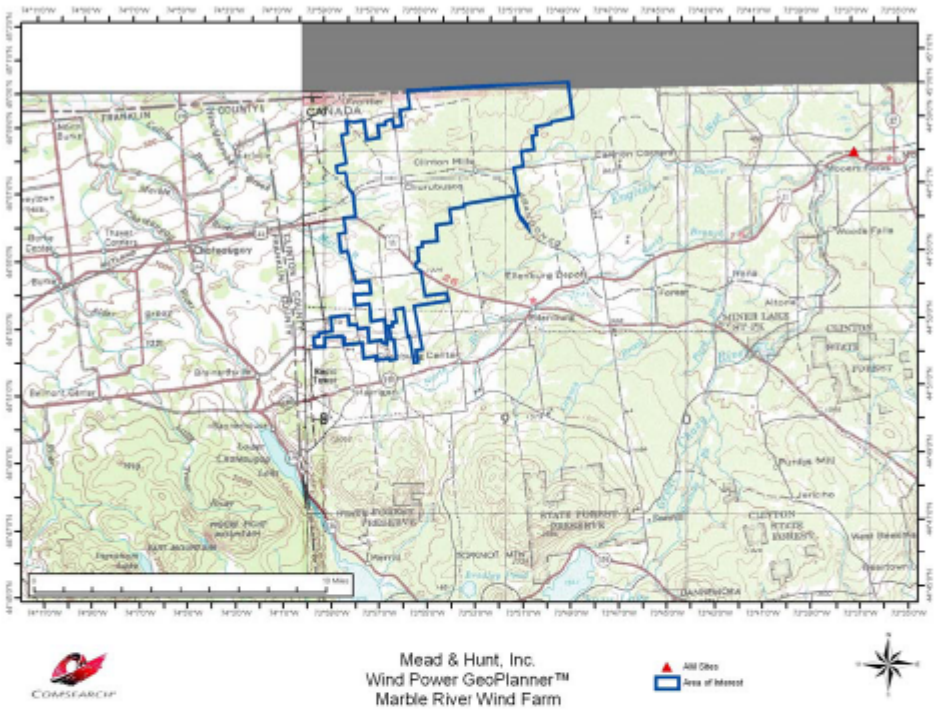


Figure 1: Plot of AM Radio Stations

FM Radio Analysis
Comsearch determined that there is only one FM station within a 15 mile radius of the project center point, as shown in Table 2 and Figure 2.

FM stations' coverage when they are at distances greater than 2.5 miles from wind turbines are not subject to degradation. The problem that may occur when wind turbines are too close to FM broadcast antennas is that the coverage pattern of the FM station will be decreased in the direction of the wind turbine(s) due to the physical obstruction of the tower and wind turbine blades. Attenuation of the signal can be as great as 2.5 dB in the azimuth that the wind turbine(s) obstructs. This will affect reception at the perimeter of the FM station's range but not at ranges closer in to the station. The wavelength of the FM broadcast signal is long enough to wrap around the blades of a wind turbine minimizing the attenuation affect to the signal. If a station is within 2.5 miles and its antenna can be raised to a height above the wind turbines blades its maximum range will be unaffected.

Since WYUL is located within 1.2 miles from the closest point of the project area, placement of the wind turbines should consider the recommended 2.5 mile minimum separation distance from the FM station to avoid degradation to FM coverage.

ID	Call Sign	Status	Frequency (MHz)	Transmit ERP (kW)	City	ST	Distance from center of AOI (mi)
1	WYUL	LIC	94.7	1.4	CHATEAUGAY	NY	7.42

Table 2: FM Radio Stations

Legend:

NY = New York
MHz = megahertz
kW = kilowatt
LIC = Licensed and Operational
mi = mile
ERP= transmit effective radiated power

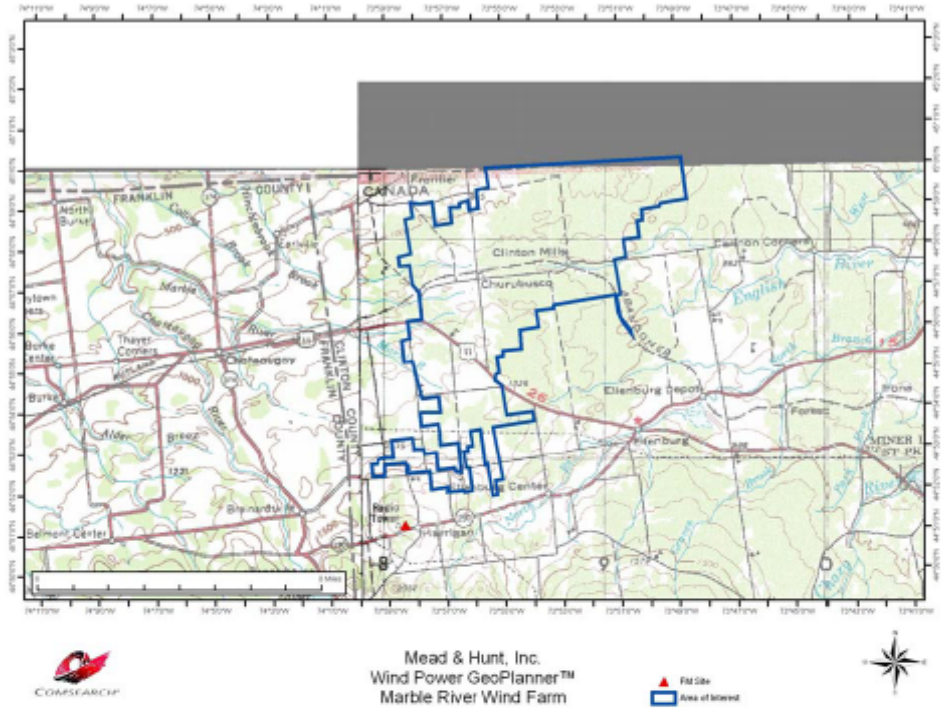


Figure 2: Plot of FM Radio Stations

3. Contact Us

For questions or information regarding the AM and FM Radio Report, please contact:

Contact person:	Kurt Oliver
Title:	Director, Field Services
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5675
Fax:	703-726-5595
Email:	koliver@comsearch.com
Web site:	www.comsearch.com

APPENDIX C

TV REPORT

Wind Power GeoPlanner™

Off-Air TV Analysis

Marble River Wind Farm

Prepared on Behalf of
Mead & Hunt, Inc.

August 3, 2010

COMSEARCH
A CommScope Company

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1. Introduction

Comsearch was contracted by Mead & Hunt, Inc. to assess the off-air television stations whose service could potentially be affected by the proposed Marble River Wind Farm in Clinton County, New York. Off-air stations are television broadcasters that transmit signals that can be received directly on a television receiver from terrestrially located broadcast facilities. Comsearch examined the coverage of the off-air TV stations and the communities in the area that could potentially have degraded television reception because of the location of the proposed wind farm.

2. Summary of Results

To begin the analysis, Comsearch compiled all off-air television stations within 100 miles of the wind project area. Appendix A contains a tabular summary of these stations. A plot depicting their locations appears in Figure 1 below. Since the Marble River Wind Farm is near the Canadian border, both U.S. and Canadian television stations were considered in the analysis.

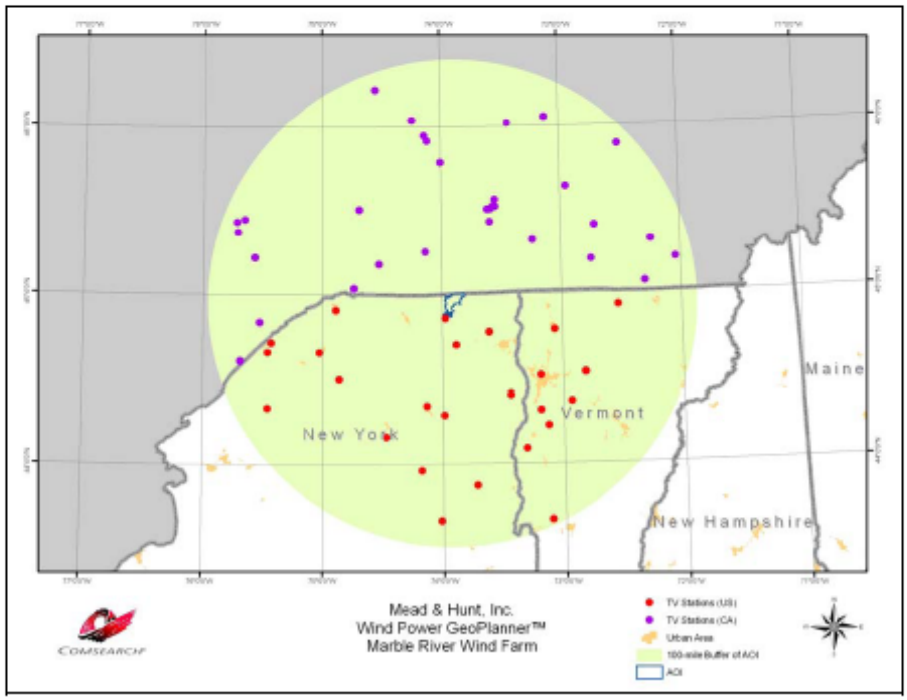


Figure 1: Plot of Off-air TV Stations within 100 miles of project area

The most likely TV stations that will produce off-air coverage to the wind project area will be those stations at a distance of 40 miles or less. The stations within 40 miles are listed in Table 1 and shown in Figure 2. There are a total of 21 database records within this distance in the combined U.S. and Canadian database search. There are no stations operating within the boundaries of the proposed project. The closest station is a low power translator, W49BI, located in Ellenburg, NY at a distance of 7.42 miles from the center of the project area. This station has limited range and programming. The closest licensed full power television stations are WCFE located in Plattsburgh, NY and CJOH located in Cornwall, Ontario. The remaining stations located within 40 miles of the project are low power television stations that operate with limited range and limited programming, or are Canadian stations in the application process and not fully licensed.

ID	Call Sign	Status	Service	Channel	City	ST	Distance from center of project (mi)
US 1	W49BI	CP	TX	49	ELLENBURG	NY	7.42
US 2	W49BI	LIC	TX	49	ELLENBURG	NY	7.42
US 3	WCFE-TV	APP	DT	38	PLATTSBURGH	NY	17.98
US 4	WCFE-TV	LIC	DT	38	PLATTSBURGH	NY	17.98
US 5	WCFE-TV	CP	DX	38	PLATTSBURGH	NY	17.98
US 6	W36DN-D	APP	LD	47	BURLINGTON	VT	19.79
US 7	W36DN-D	APP	LD	47	BURLINGTON	VT	19.79
US 8	WWBI-LP	LIC	CA	27	PLATTSBURGH	NY	19.82
CA 1	QU-DT-240			50	VALLEYFIELD	QC	23.30
CA 2	CJOH-DT-8			45	CORNWALL	ON	33.88
CA 3	CJOH-PT-8			8	CORNWALL	ON	33.88
CA 4	CJOH-TV-8			8	CORNWALL	ON	33.88
CA 5	ON-PT-1377			45	CORNWALL	ON	33.88
CA 6	QC-PT-1956			15	MONTREAL	QC	36.37

Table 1: Off-air TV Stations within 40 miles of project area

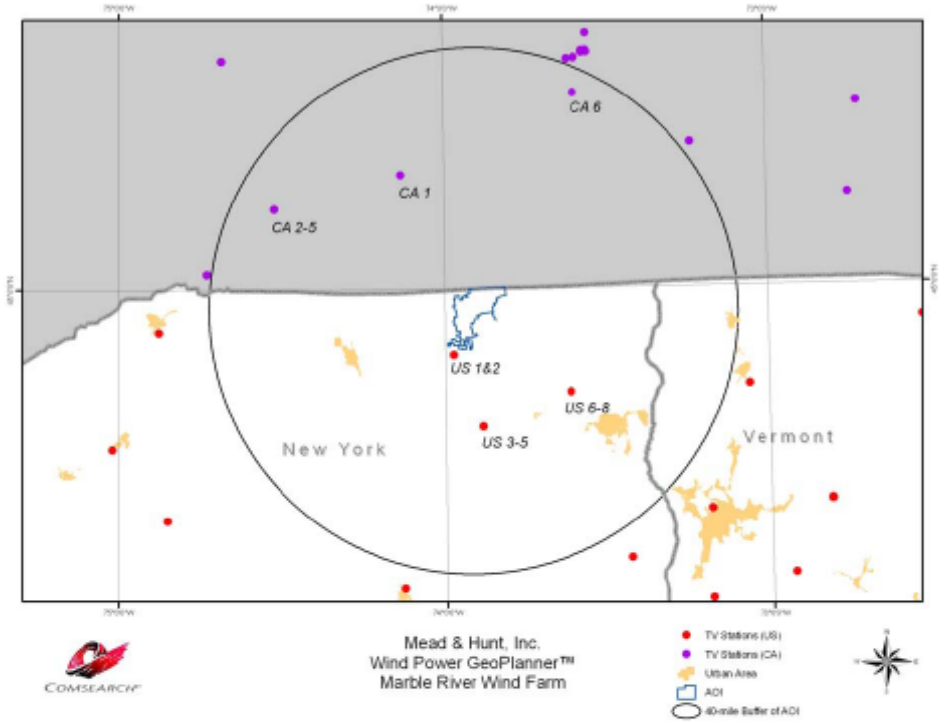


Figure 2: Plot of Off-air TV Stations within 40 miles of project area

The off-air television available to the local communities comes from stations widely spread across the surrounding communities. Because of this, it is not likely that the reception of all television stations will be affected once the project's wind turbines are installed. However, one or more channels could be degraded in some locations. If the degradation to TV reception is significant after the installation of the turbines, the wind developer may offer cable or direct broadcast satellite (DBS) to offset the lost coverage. Cable and DBS will be unaffected by the presence of the wind turbines.

3. Appendix A

ID	Call Sign	Status	Service[1]	Channel	City	ST	Distance from center of project (mi)
US 1	W49BI	CP	TX	49	ELLENBURG	NY	7.42
US 2	W49BI	LIC	TX	49	ELLENBURG	NY	7.42
US 3	WCFE-TV	APP	DT	38	PLATTSBURGH	NY	17.98
US 4	WCFE-TV	LIC	DT	38	PLATTSBURGH	NY	17.98
US 5	WCFE-TV	CP	DX	38	PLATTSBURGH	NY	17.98
US 6	W36DN-D	APP	LD	47	BURLINGTON	VT	19.79
US 7	W36DN-D	APP	LD	47	BURLINGTON	VT	19.79
US 8	WWBI-LP	LIC	CA	27	PLATTSBURGH	NY	19.82
CA 1	QU-DT-240			50	Valleyfield	QC	23.30
CA 2	CJOH-DT-8			45	Cornwall	ON	33.88
CA 3	CJOH-PT-8			8	Cornwall	ON	33.88
CA 4	CJOH-TV-8			8	Cornwall	ON	33.88
CA 5	ON-PT-1377			45	Cornwall	ON	33.88
CA 6	QC-PT-1956			15	Montreal	QC	36.37
CA 7	ON-DT-116			28	Cornwall	ON	40.63
CA 8	ON-DT-117			36	Cornwall	ON	40.63
CA 9	ON-DT-118			47	Cornwall	ON	40.63
CA 10	ON-DT-119			31	Cornwall	ON	40.63
CA 11	ON-DT-120			55	Cornwall	ON	40.63
CA 12	ON-PT-1378			28	Cornwall	ON	40.63
CA 13	ON-PT-1379			29	Cornwall	ON	40.63
CA 14	ON-PT-1380			31	Cornwall	ON	40.63
CA 15	ON-PT-1382			47	Cornwall	ON	40.63
CA 16	CFTU-DT			54	Montreal	QC	40.76
CA 17	CFTU-PT			29	Montreal	QC	40.76
CA 18	CFTU-TV			29	Montreal	QC	40.76
CA 19	CJNT-DT			69	Montreal	QC	41.32

[1] Definitions of Service codes:
TV –Normal Broadcast Station
DS-Digital Service Television, Temporary Operation, STA Operation
DT-Digital Television Broadcast Station
DR- Indicates Station has Applied for FCC Rule Making
DN-New Digital Station, Not Yet Operational
GRA(NT)-Indicates Rule Making was granted by FCC
LP-Low Power Television Broadcast Station
TX-Translator Television Broadcast Station
TA-Vacant channel
LIC – Licensed and operational station
CP – License approved construction permit granted
APP – License application, not yet operational
STA – Special transmit authorization, usually granted by FCC for temporary operation
LD – Digital Low Power Television Station
DC – Digital Class A Television Station

ID	Call Sign	Status	Service[1]	Channel	City	ST	Distance from center of project (mi)
CA 20	CJNT-PT			49	Montreal	QC	41.32
CA 21	CJNT-TV			62	Montreal	QC	41.32
CA 22	CBFT			2	Montreal	QC	41.35
CA 23	CBFT-DT			19	Montreal	QC	41.35
CA 24	CBFT-PT			19	Montreal	QC	41.35
CA 25	CBMT			6	Montreal	QC	41.35
CA 26	CBMT-DT			20	Montreal	QC	41.35
CA 27	CBMT-PT			21	Montreal	QC	41.35
CA 28	CFCF-DT			21	Montreal	QC	41.35
CA 29	CFCF-DT			12	Montreal	QC	41.35
CA 30	CFCF-PT			12	Montreal	QC	41.35
CA 31	CFCF-TV			12	Montreal	QC	41.35
CA 32	CFCF-TV			12	Montreal	QC	41.35
CA 33	CFJP-PT			35	Montreal	QC	41.35
CA 34	CFJP-TV			35	Montreal	QC	41.35
CA 35	CFTM-DT			59	Montreal	QC	41.35
CA 36	CFTM-DT(1)			10	Montreal	QC	41.35
CA 37	CFTM-PT			10	Montreal	QC	41.35
CA 38	CFTM-TV			10	Montreal	QC	41.35
CA 39	CFTM-TV			10	Montreal	QC	41.35
CA 40	CIVM-PT			26	Montreal	QC	41.35
CA 41	CIVM-TV			17	Montreal	QC	41.35
CA 42	CKMI-DT-1			51	Montreal	QC	41.35
CA 43	CKMI-PT-1			51	Montreal	QC	41.35
CA 44	CKMI-TV-1			46	Montreal	QC	41.35
CA 45	QC-PT-1952			2	Montreal	QC	41.35
CA 46	QC-PT-1953			6	Montreal	QC	41.35
CA 47	QC-PT-1962			36	Montreal	QC	41.35
CA 48	QU-DT-248			61	Montreal	QC	41.35
CA 49	QC-PT-2112			4	St-Jean	QC	41.69
CA 50	QC-PT-2113			48	St-Jean	QC	41.69
CA 51	QU-DT-221			4	St-Jean	QC	41.69
CA 52	QU-DT-182			20	Montreal	QC	42.54
CA 53	QU-DT-184			26	Montreal	QC	42.54
CA 54	CFJP-DT			42	Montreal	QC	42.82
CA 55	CBFT-DT(1)			19	Montreal	QC	42.93
CA 56	CBMT-DT(1)			20	Montreal	QC	42.93
CA 57	CFTM-DT			59	Montreal	QC	43.10
US 9	WNMN	CP MOD	DT	40	SARANAC LAKE	NY	43.53
US 10	DWBVT-CA	APP	CA	30	BURLINGTON	VT	43.82
US 11	W52CD	LIC	TX	52	ST. ALBANS	VT	43.82
US 12	W67AR	CP	LD	46	WILLSBORO	NY	45.00
US 13	W67AR	LIC	TX	67	WILLSBORO	NY	45.00

ID	Call Sign	Status	Service[1]	Channel	City	ST	Distance from center of project (mi)
CA 58	CIVM-DT			27	Montreal	QC	45.51
US 14	W55AI	LIC	TX	55	LAKE PLACID	NY	46.27
US 15	W20BA	LIC	TX	20	MASSENA	NY	47.25
US 16	WNYF-LP	LIC	TX	28	MASSENA	NY	47.25
US 17	W51CB	LIC	TX	51	BURLINGTON	VT	47.57
US 18	W36DN-D	CP	LD	36	BURLINGTON	VT	47.64
CA 59	CHLF-DT-2			31	Hawkesbury	ON	53.67
CA 60	CHLF-PT-2			39	Hawkesbury	ON	53.67
CA 61	CHLF-TV-2			39	Hawkesbury	ON	53.67
CA 62	CICO-DT-96			52	Hawkesbury	ON	53.67
CA 63	CICO-PT-96			48	Hawkesbury	ON	53.67
CA 64	CICO-TV-96			48	Hawkesbury	ON	53.67
CA 65	ON-PT-1423			31	Hawkesbury	ON	53.67
US 19	WNPI-DT	APP	DT	23	NORWOOD	NY	56.01
US 20	WNPI-DT	LIC	DT	23	NORWOOD	NY	56.01
US 21	WNYF-LP	CP	LD	18	MASSENA	NY	56.01
US 22	DW19BR	LIC	CA	19	MONKTON	VT	57.29
US 23	WGMU-CA	LIC	CA	39	BURLINGTON	VT	57.29
US 24	WGMU-LD	CP	LD	49	BURLINGTON	VT	57.29
CA 66	QC-PT-2114			23	St-Jerome	QC	57.62
CA 67	QU-DT-222			36	St-Jerome	QC	57.62
US 25	NEW	APP	LD	26	POTSDAM	NY	57.87
CA 68	QU-DT-136			28	Cowansville	QC	59.40
US 26	W25AT	CP	LD	25	TUPPER LAKE	NY	61.27
US 27	W25AT	LIC	TX	25	TUPPER LAKE	NY	61.27
US 28	W14CK	APP	CA	47	NEWPORT	VT	61.93
US 29	WVNY-DR	GRANT	DR	13	BURLINGTON	VT	61.93
US 30	WPTZ	LIC	DT	14	NORTH POLE	NY	62.00
US 31	WCAX-TV	APP	DT	22	BURLINGTON	VT	62.00
US 32	WCAX-TV	CP	DT	22	BURLINGTON	VT	62.00
US 33	WCAX-TV	LIC	DT	53	BURLINGTON	VT	62.00
US 34	WVNY	LIC	DT	13	BURLINGTON	VT	62.00
US 35	WFFF-TV	LIC	DT	43	BURLINGTON	VT	62.00
US 36	WETK	APP	DT	32	BURLINGTON	VT	62.08
US 37	WETK	LIC	DT	32	BURLINGTON	VT	62.08
US 38	W16AL	CP	LD	16	BURLINGTON	VT	63.61
US 39	W16AL	LIC	TX	16	BURLINGTON	VT	63.61
US 40	W25BT	CP	LD	25	MONKTON	VT	64.03
US 41	W25BT	LIC	TX	25	MONKTON	VT	64.03
CA 69	QU-DT-146			36	Granby	QC	66.11
CA 70	QU-DT-147			15	Granby	QC	66.11
CA 71	QU-DT-148			25	Granby	QC	66.11
CA 72	QC-PT-2111			39	St-Hyacinthe	QC	66.47

ID	Call Sign	Status	Service[1]	Channel	City	ST	Distance from center of project (mi)
CA 73	QU-DT-220			39	St-Hyacinthe	QC	66.47
CA 74	QC-PT-2095			39	Ste-Adele	QC	67.03
CA 75	QU-DT-226			39	Ste-Adele	QC	67.03
US 42	W46IT-D	LIC	LD	46	PORT HENRY	NY	67.09
US 43	W14CK	LIC	CA	14	NEWPORT	VT	68.55
CA 76	QU-DT-227			28	Ste-Adele	QC	69.40
US 44	W12BG	LIC	TX	12	NEWCOMB	NY	70.02
US 45	W13DG	CP	TX	13	OGDENSBURG	NY	75.75
US 46	W07BI	LIC	TX	7	SCHROON LAKE	NY	75.82
US 47	W09BB	LIC	TX	9	SCHROON LAKE	NY	75.82
CA 77	QC-PT-2096			33	Ste-Agathe-Des-Monts	QC	76.47
CA 78	QU-DT-229			52	Ste-Agathe-Des-Monts	QC	76.47
CA 79	QC-PT-2097			49	Ste-Agathe-Des-Monts	QC	76.50
CA 80	QU-DT-228			31	Ste-Agathe-Des-Monts	QC	76.50
CA 81	QC-PT-1884			43	Joliette	QC	77.16
CA 82	QU-DT-152			50	Joliette	QC	77.16
US 48	W20CV	CP	TX	20	OGDENSBURG	NY	78.24
CA 83	CKWS-DT-2			3	Prescott	ON	79.40
CA 84	CKWS-PT-2			48	Prescott	ON	79.40
CA 85	CKWS-TV-2			26	Prescott	ON	79.40
CA 86	ON-PT-1580			3	Prescott	ON	79.40
CA 87	QC-PT-1773			16	Bolton-Est	QC	79.43
CA 88	QC-PT-1774			47	Bolton-Est	QC	79.43
CA 89	QU-DT-114			16	Bolton-Est	QC	79.43
CA 90	CFMT-DT-2			27	Ottawa	ON	82.86
CA 91	CFMT-PT-2			27	Ottawa	ON	82.86
CA 92	CFMT-TV-2			60	Ottawa	ON	82.86
CA 93	CHCH-DT-1			33	Ottawa	ON	82.86
CA 94	CHCH-PT-1			22	Ottawa	ON	82.86
CA 95	CHCH-TV-1			11	Ottawa	ON	82.86
CA 96	CHRO-DT-43			67	Ottawa	ON	82.86
CA 97	CHRO-PT-43			43	Ottawa	ON	82.86
CA 98	CHRO-TV-43			43	Ottawa	ON	82.86
CA 99	CITS-DT-1			42	Ottawa	ON	82.86
CA 100	CITS-PT-1			42	Ottawa	ON	82.86
CA 101	CITS-TV-1			32	Ottawa	ON	82.86
CA 102	CITY-DT-3			17	Ottawa	ON	82.86
CA 103	CITY-DT-3			17	Ottawa	ON	82.86
CA 104	CITY-PT-3			17	Ottawa	ON	82.86
CA 105	CITY-TV-3			65	Ottawa	ON	82.86
CA 106	CJMT-DT-2			66	Ottawa	ON	82.86
CA 107	CJMT-PT-2			20	Ottawa	ON	82.86
CA 108	CJMT-TV-2			14	Ottawa	ON	82.86

ID	Call Sign	Status	Service[1]	Channel	City	ST	Distance from center of project (mi)
CA 109	ON-PT-1535			11	Ottawa	ON	82.86
CA 110	ON-PT-1547			50	Ottawa	ON	82.86
CA 111	QC-PT-2092			23	Sorel	QC	85.15
CA 112	QC-PT-2093			44	Sorel	QC	85.15
CA 113	QC-PT-2094			48	Sorel	QC	85.15
CA 114	QU-DT-215			23	Sorel	QC	85.15
CA 115	QU-DT-216			54	Sorel	QC	85.15
CA 116	QU-DT-217			48	Sorel	QC	85.15
CA 117	CFKS-DT			66	Sherbrooke	QC	85.35
CA 118	CFKS-PT			41	Sherbrooke	QC	85.35
CA 119	CFKS-TV			30	Sherbrooke	QC	85.35
CA 120	CHLT-DT			60	Sherbrooke	QC	85.35
CA 121	CHLT-DT			7	Sherbrooke	QC	85.35
CA 122	CHLT-PT			7	Sherbrooke	QC	85.35
CA 123	CHLT-TV			7	Sherbrooke	QC	85.35
CA 124	CIVS-DT			65	Sherbrooke	QC	85.35
CA 125	CIVS-PT			24	Sherbrooke	QC	85.35
CA 126	CIVS-TV			24	Sherbrooke	QC	85.35
CA 127	CKMI-DT-2			41	Sherbrooke	QC	85.35
CA 128	CKMI-PT-2			11	Sherbrooke	QC	85.35
CA 129	CKMI-TV-2			11	Sherbrooke	QC	85.35
CA 130	CKSH-DT			55	Sherbrooke	QC	85.35
CA 131	CKSH-PT			9	Sherbrooke	QC	85.35
CA 132	CKSH-TV			9	Sherbrooke	QC	85.35
CA 133	QC-PT-2088			27	Sherbrooke	QC	85.35
CA 134	QC-PT-2089			30	Sherbrooke	QC	85.35
CA 135	QU-DT-213			64	Sherbrooke	QC	85.35
US 49	W09CV	CP	TX	9	GOUVERNEUR	NY	87.00
US 50	W07BH	LIC	TX	7	NORTH CREEK, ETC.	NY	89.90
US 51	W09AZ	LIC	TX	9	NORTH CREEK, ETC.	NY	89.90
US 52	W11AW	LIC	TX	11	NORTH CREEK, ETC.	NY	89.90
CA 136	ON-DT-113			31	Brockville	ON	90.40
CA 137	ON-PT-1360			31	Brockville	ON	90.40
CA 138	ON-PT-1361			39	Brockville	ON	90.40
CA 139	CRC-DT-4			46	Ottawa	ON	91.23
CA 140	CRC-DT-3			46	Ottawa	ON	92.19
CA 141	CBFT-1			11	Mont-Tremblant	QC	92.92
CA 142	CBFT-DT-1			56	Mont-Tremblant	QC	92.92
CA 143	CBFT-PT-1			11	Mont-Tremblant	QC	92.92
CA 144	QU-DT-106			31	Ayer's Cliff	QC	93.19
CA 145	CRC-DT-5			46	Gatineau	QC	93.87
CA 146	QC-PT-1829			29	Drummondville	QC	94.13
CA 147	QU-DT-139			29	Drummondville	QC	94.13

ID	Call Sign	Status	Service[1]	Channel	City	ST	Distance from center of project (mi)
CA 148	QU-DT-140			52	Drummondville	QC	94.13
US 53	WVER-TV	GRANT	DR	9	RUTLAND	VT	98.16
US 54	WVER	LIC	DT	9	RUTLAND	VT	98.18
US 55	W61CE	LIC	TX	61	RUTLAND	VT	98.18

Table A: Off-air TV Stations within 100 miles of project area

4. Contact Us

For questions or information regarding the Off-Air TV Analysis, please contact:

Contact person:	Kurt R. Oliver
Title:	Director, Field Services
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5675
Fax:	703-726-5595
Email:	koliver@comsearch.com
Web site:	www.comsearch.com

APPENDIX D

FAA INFORMATION

KMAL Malone-Dufort Airport

Malone, New York, USA

FAA INFORMATION EFFECTIVE 29 JULY 2010

Location

FAA Identifier: MAL

Lat/Long: 44-51-13.1660N / 074-19-44.2190W
44-51.219433N / 074-19.736983W
44.8536572 / -74.3289497
(estimated)

Elevation: 790 ft. / 240.8 m (surveyed)

Variation: 15W (2000)

From city: 2 miles W of MALONE, NY

Time zone: UTC -4 (UTC -5 during Standard Time)

Zip code: 12953

Airport Operations

Airport use: Open to the public

Activation date: 11/1942

Sectional chart: MONTREAL

Control tower: no

ARTCC: BOSTON CENTER

FSS: BURLINGTON FLIGHT SERVICE STATION

NOTAMs facility: BTV (NOTAM-D service available)

Attendance: ON CALL
ARPT ATNDD APR-NOV SAT-SUN & HOLS; OTHER TIMES CALL 518-483-2431.

Pattern altitude: 1590 ft. MSL

Wind indicator: lighted

Segmented circle: yes

Lights: DUSK-DAWN
ACTVT MIRL RY 05/23, 14/32 & TWY LGTS - CTAF.

Beacon: white-green (lighted land airport)
ARPT BCN OTS INDEFLY.

Airport Communications

CTAF/UNICOM: 122.8

- APCH/DEP SVC PRVDD BY BOSTON ARTCC ON FREQS 135.25/377.1 (TURIN RCAG).

Nearby radio navigation aids

VOR radial/distance	VOR name	Freq	Var
MSSr116/17.1	MASSENA VORTAC	114.10	14W
SLKr003/28.6	SARANAC LAKE VOR/DME	109.20	14W
PLBr301/35.8	PLATTSBURGH VORTAC	116.90	15W

NDB name	Hdg/Dist	Freq	Var	ID
POTSDAM	086/24.8	400	14W	PTD .--. - -..

Airport Services

Parking: tiedowns

Airframe service: NONE

Powerplant service: NONE

Bottled oxygen: NONE

Bulk oxygen: NONE

Runway Information

Runway 5/23

Dimensions: 4000 x 100 ft. / 1219 x 30 m

Surface: asphalt, in excellent condition

Runway edge lights: medium intensity

	RUNWAY 5	RUNWAY 23
Latitude:	44-50.968667N	44-51.494500N
Longitude:	074-20.178000W	074-19.623000W
Elevation:	769.9 ft.	753.6 ft.
Gradient:	0.4%	0.4%
Traffic pattern:	left	left
Runway heading:	051 magnetic, 036 true	231 magnetic, 216 true
Markings:	nonprecision, in good condition	nonprecision, in good condition
Runway end identifier lights:	yes	yes
Obstructions:	40 ft. pole, 792 ft. from runway, 209 ft. left of centerline, 14:1 slope to clear	37 ft. trees, 557 ft. from runway, 293 ft. right of centerline, 9:1 slope to clear

Runway 14/32

Dimensions: 3245 x 75 ft. / 989 x 23 m

Surface: asphalt, in excellent condition

Runway edge lights: medium intensity

	RUNWAY 14	**RUNWAY 32**
Latitude:	44-51.365000N	44-51.044000N
Longitude:	074-19.836500W	074-19.235333W
Elevation:	759.0 ft.	789.7 ft.
Gradient:	0.9% UP	0.9% DOWN
Traffic pattern:	left	left
Runway heading:	141 magnetic, 126 true	321 magnetic, 306 true
Markings:	basic, in good condition	basic, in good condition
Obstructions:	none	29 ft. tree, 481 ft. from runway, 140 ft. right of centerline, 9:1 slope to clear

Airport Ownership and Management from official FAA records

Ownership: Publicly-owned

Owner: TOWN OF MALONE
12 ELM ST
MALONE, NY 12953
Phone 518-483-2431

Manager: MARK BESIO
12 ELM ST
MALONE, NY 12953
Phone 518-483-2431

GPS RWY 5
MALONE-DUFORT (MAL)

APP CRS	Rwy Idg	4000
052°	TDZE	770
	Apt Elev	790

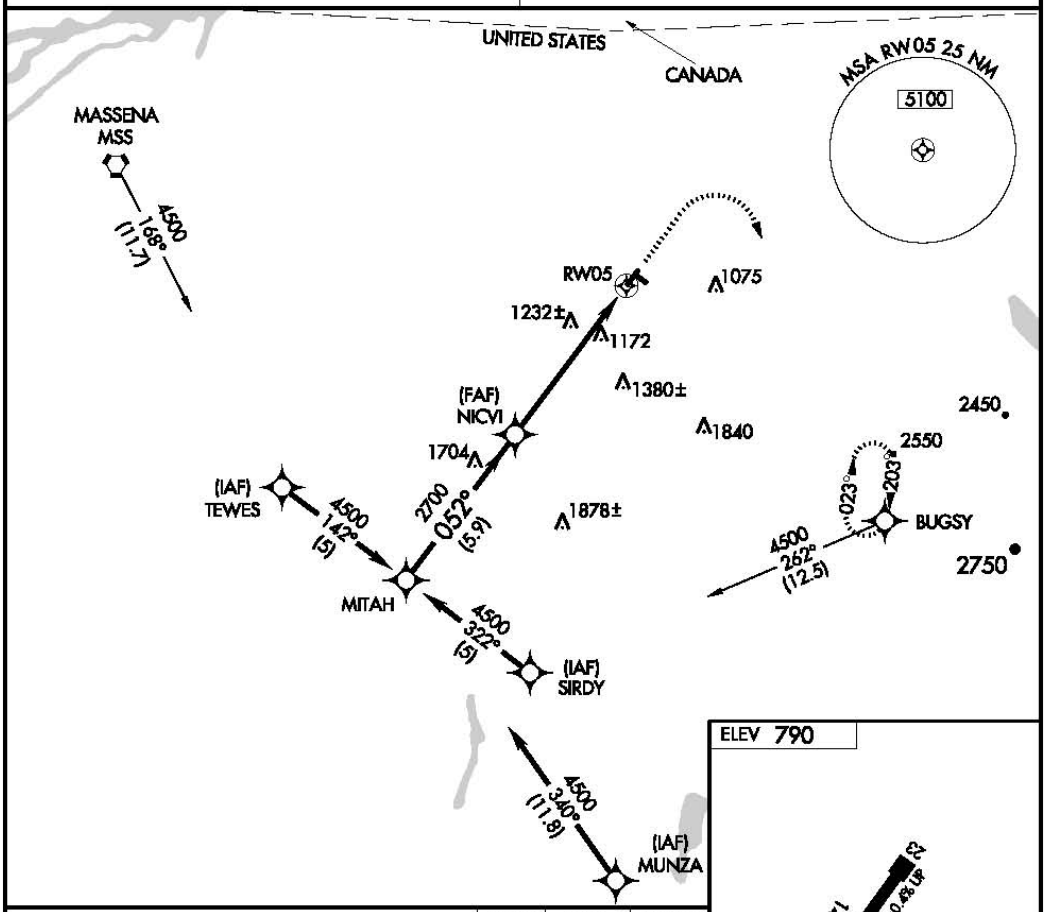
NA

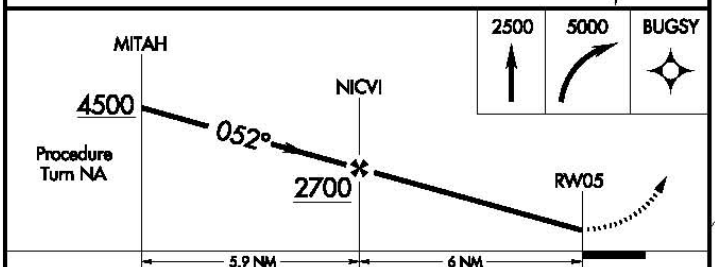
Use Massena Intl-Richards Field altimeter setting.

MISSED APPROACH: Climb to 2500 then climbing right turn to 5000 direct BUGSY WP and hold.

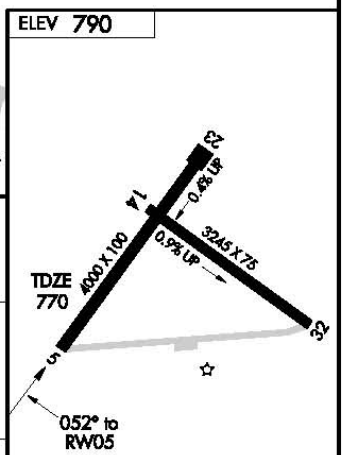
BOSTON CENTER
135.25 377.1

UNICOM
122.8 (CTAF)





CATEGORY	A	B	C	D
S-5	1680-1¼	910 (900-1¼)	1680-2¾ 910 (900-2¾)	NA
CIRCLING	1680-1¼	890 (900-1¼)	1680-2¾ 890 (900-2¾)	NA



REIL Rwys 5 and 23
MIRL Rwy 5-23 and 14-32

NE-2, 29 JUL 2010 to 26 AUG 2010
NE-2, 29 JUL 2010 to 26 AUG 2010

MALONE, NEW YORK

AL-971 (FAA)

GPS RWY 23

MALONE-DUFORT (MAL)

APP CRS	Rwy Idg	4000
232°	TDZE	769
	Apt Elev	790

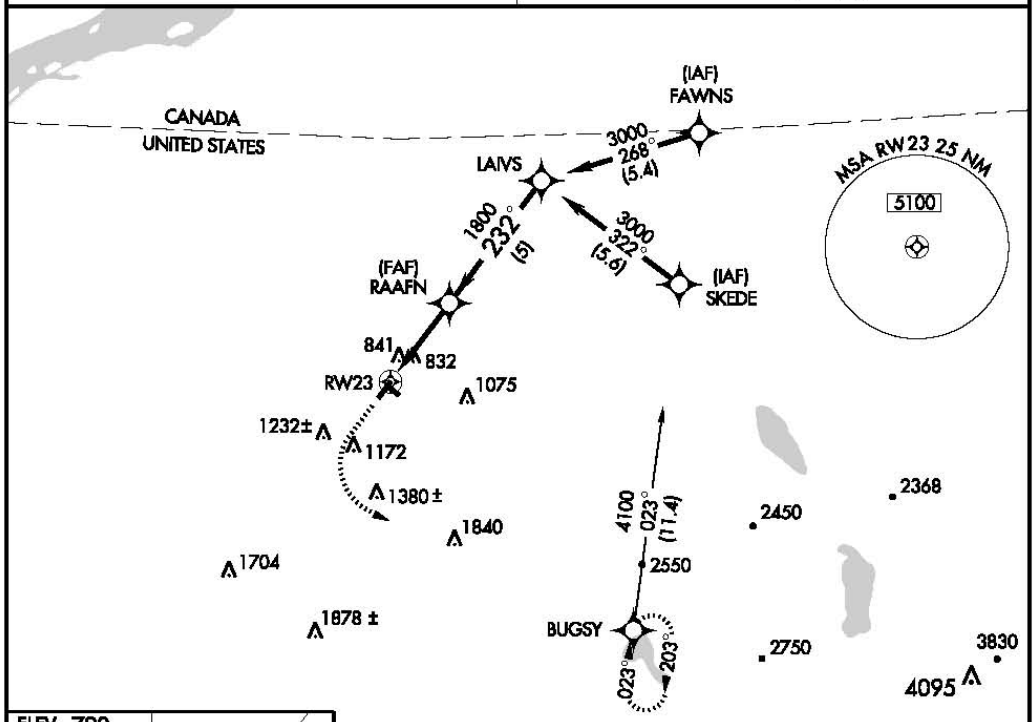
Use Massena Intl-Richards Field altimeter setting.

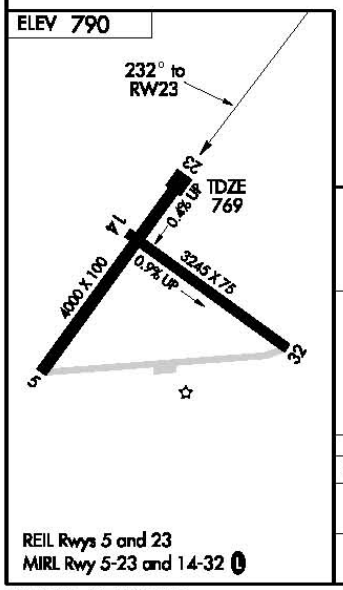
NA

MISSED APPROACH: Climb to 2500 then climbing left turn to 5000 direct BUGSY WP and hold.

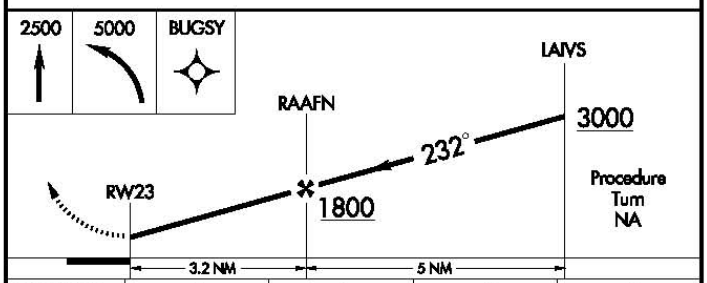
BOSTON CENTER
135.25 377.1

UNICOM
122.8 (CTAF)





REIL Rwys 5 and 23
MIRL Rwy 5-23 and 14-32



CATEGORY	A	B	C	D
S-23	1280-1	511 (500-1)	1280-1½ 511 (500-1½)	NA
CIRCLING	1500-1 710 (800-1)	1520-1 730 (800-1)	1520-2 730 (800-2)	NA

MALONE, NEW YORK
Orig 08045

44°51'N - 74°20'W

MALONE-DUFORT (MAL)
GPS RWY 23

NE-2, 29 JUL 2010 to 26 AUG 2010

NE-2, 29 JUL 2010 to 26 AUG 2010

Instrument Flight Procedures (IFP) Production Plan

Sorted By: Service Area, State, Airport ID, Scheduled Publication Date
Data as of 08-05-2010 02:00 AM CDT
Service Area: All State: All Airport ID: MAL
4 items found, displaying all items.

State	Airport ID	City/Name	Description	Scheduled Pub Date	Status	Actual Pub Date
NY	KMAL	Malone/Malone-Dufort	RNAV (GPS) RWY 5, ORIG	04/05/2012	Pending	
NY	KMAL	Malone/Malone-Dufort	DP MALONE NY KMAL, AMDT 2	04/05/2012	Pending	
NY	KMAL	Malone/Malone-Dufort	DP MALONE NY KMAL, AMDT 1	04/05/2012	Pending	
NY	KMAL	Malone/Malone-Dufort	RNAV (GPS) RWY 23, ORIG	04/05/2012	Pending	

* Next to Status Identifies an IFP Contingent upon Survey

F Next to Status Identifies a Delay Due to Funding

W Next to Status Identifies a Delay Due to WAAS outage