

INVASIVE SPECIES MANAGEMENT PLAN

Prepared for

Marble River Wind Farm

Joint Wetland Permit Application

August 2007

## **1.0 INTRODUCTION**

Marble River, LLC is proposing to develop an approximately 218 megawatt wind-powered electric generating facility located in the Towns of Clinton and Ellenburg in Clinton County, New York. The proposed Marble River Wind Farm entails the installation of up to 109 wind turbines, approximately 42 miles of access roads, approximately 56 miles of underground electric collection lines, approximately 10 miles of overhead collection lines, three permanent meteorological towers, a substation and an operations and maintenance building/temporary laydown area. The Project will result in temporary and permanent impacts to 65.52 and 8.94 acres of wetlands and 5,092 and 1,186 linear feet of stream, respectively, subject to the regulatory authority of the Corps New York District and the New York Department of Environmental Conservation (NYDEC). Therefore, the Project Area or, the area within which invasive species management efforts will occur, includes temporarily and permanently impacted wetlands and streams as well as adjacent areas of concern to NYDEC. The following is the Invasive Species Management Plan for the Project. It contains the practices and procedures Marble River, LLC proposes to implement to control the spread of invasive species.

### **1.1 Definition**

Invasive plant species are plants that have been introduced into an environment outside of their native range, where they have few or no natural enemies to limit their spread. When they move into the environment, they are able to colonize the area and dominate or disrupt natural communities. Even if these plants are native elsewhere on the continent or in the state, they are regarded as invasive vegetation if they colonize areas beyond their natural range of dispersal, such as native woody species that invade a prairie site. The spread of invasive plant species is a significant issue in construction projects that involve land disturbance. Earth moving activities contribute to the spread of invasive species, as does the use of contaminated construction fill, seed, or erosion-control products.

### **1.2 Purpose**

The purpose of the Invasive Species Management Plan is to facilitate the identification, control, and monitoring of invasive vegetation thereby preventing its spread, which is the least expensive and most effective way to halt the spread of invasive vegetation. Preventing the establishment or spread of invasive species relies upon:

- Educating workers about the importance of managing invasive species;
- Properly identifying invasive species;
- Avoiding or treating existing invasive species populations; and
- Incorporating measures into the Project that prevent invasive species seeds or other plant parts from establishing new or larger populations.

### **1.3 Goal**

The goal of the Invasive Species Management Plan is to prevent expansion of invasive species within the Project Area during the effective term of the permit. Invasive plant control will be considered successful only when a 0% net increase in the aerial coverage of invasive species compared to the baseline survey of the Project Area is realized. If the goal of this Invasive Species Management Plan is not met within the first five years post construction, Marble River, LLC will review its control efforts with NYSDEC, submit a revised control plan, and implement control actions for an additional five-year monitoring term.

## **2.0 LAWS AND REGULATIONS**

### **2.1 Federal**

There are many federal laws that contain provisions for the control of invasive species and establishment of native species that apply to Federal land management, stewardship and other activities such as the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 *et seq.*), Lacey Act, as amended (18 U.S.C. 42), Federal Plant Pest Act (7 U.S.C. 150aa *et seq.*), Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 *et seq.*), and Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). In addition, the Feb 3, 1999, Executive Order 13112 established the National Invasive Species Council to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts caused by invasive species. However, the Federal law applicable to the management of invasive species in this situation is Section 404 of the Clean Water Act (and it's implementing regulations).

### **2.2 New York State**

The following Articles of the New York Consolidated Laws regulate management of invasive species in the State of New York:

- Inspection and Sale of Seeds (Article 9)
- Integrated Pest Management Program (Article 11)
- Prevention and Control of Disease in Trees and Plants; Insect Pests; Sale of Fruit-bearing Trees (Article 14)
- Forest Insect and Disease Control (Article 9, Title 13)
- Fish and Wildlife (Article 11)
- Fish and Wildlife Management Practices Cooperative Program (Title 5)

The NYDEC and the New York State Department of Agriculture and Markets have the regulatory authority to implement these laws.

## **3.0 IDENTIFICATION**

Seven invasive species were identified by the NYSDEC as potentially occurring within the Project area. These species, their common characteristics and typical locations are provided in Table 3-1 below.

**Table 3-1  
NYSDEC Identified Species**

<b>Plant Species</b>	<b>Common Characteristics</b>	<b>Typical Locations</b>
Common Reed ( <i>Phragmites australis</i> )	Forms closed, monodominant stands; seeds are dispersed by wind, water, and birds; newly opened sites colonized by seed or rhizome fragments carried to area in soils and on machinery	Tidal and non-tidal marshes, lakes, swales, and backwater areas of rivers, and streams
Eurasian Water Milfoil ( <i>Myriophyllum spicatum</i> )	Perennial, dicot herb that is submersed and rooted to the substrate; grows into dense infestations which shade out and replace other aquatic plants; spreads by sexual or vegetative reproduction with local reproduction by stolons and vegetative fragments	Lakes, ponds, shallow reservoirs, low energy areas of rivers and streams, brackish water of protected tidal creeks and bays
Japanese Knotweed ( <i>Polygonum cuspidatum</i> )	Upright, shrub like, herbaceous perennial; spreads rapidly to form dense stands, excluding native vegetation and prohibiting regeneration; dispersal by rhizome fragments and seeds	Coastland, riparian zones, ruderal/disturbed, urban areas, water courses, wetlands
Purple Loosestrife ( <i>Lythrum salicaria</i> )	Perennial, woody-stemmed herb with magenta-colored flowers (summer); reproduces by seed dispersal and vegetative propagation	Wetland habitats, including marshes, river and stream banks, pond edges, lakes, ditches, and reservoirs
Reed Canary Grass ( <i>Phalaris arundinacea</i> )	Cool-season perennial grass; spreads by creeping rhizomes and colonizes new site by seeds; forms dense, impenetrable mats of vegetations	Wet habitats such as wetlands, moist meadows, and riparian areas
Smooth Buckthorn ( <i>Rhamnus frangula</i> )	Shrub or small tree growing to seven meters; seeds are dispersed by birds, rodents, and water	Agricultural areas, natural forests, planted forests, ruderal/disturbed, wetlands
Pale Swallow-Wort ( <i>Cynanchum rossicum</i> )	Member of the milkweed family; herbaceous perennial vine; pods are abundant during July and August and open in late summer, disseminating large numbers seeds; wind dispersed seeds can travel a great distance; pure stands of suppress establishment of other species	Christmas tree plantations, perennial crops, pastures, roadsides, disturbed areas, and natural areas

All of the plant species listed in Table 3-1 above could occur in the Project Area; however, only three species, purple loosestrife, common reed, and reed canary grass were identified on-site during wetland and stream delineation efforts. The following discussion outlines management measures that will be implemented in the Project Area to identify, control, and monitor invasive species.

#### **4.0 PRE-CONSTRUCTION PHASE**

##### **4.1 Identification**

The Project Area will be surveyed prior to mobilization to identify and inventory populations of invasive species. This pre-construction baseline survey will be used during the post-construction phase to evaluate invasive species populations. The Project Area will be inspected for the presence of invasive plant communities (including the species listed above) prior to disturbance. Areas containing an infestation will be clearly identified on construction plans and in the field with signs, flagging, and/or stakes.

##### **4.2 Pre-Construction Plant Removal and Treatment**

The Applicant will determine if early removal or treatment of seed sources or reproducing plant parts is necessary prior to construction start (refer to Table 6.1 below).

##### **4.3 Training**

The Applicant and/or the Marble River Wind Farm environmental inspector will hold training sessions for all contractors and subcontractors to explain the Invasive Species Management Plan prior to the start of construction. Contractors and subcontractors will be instructed in identification of invasive plant species, control and management of invasive species during construction, and post-construction monitoring measures. Prior to construction, the Applicant, environmental inspector, and contractors and subcontractors will conduct a walkover during which areas flagged for invasive species will be identified.

#### **5.0 CONSTRUCTION PHASE**

##### **5.1 Inspection of Fill Sources**

Source locations used for importation of fill and/or construction material, including top soil, sand, gravel, rock, and crushed stone, from offsite locations for use as fill and/or construction material will be properly inspected by the environmental inspector for invasive species. If any of the invasive species listed above are found growing in or adjacent to the fill source, the material will not be accepted.

##### **5.2 Invasive Species Vegetation Removal and Disposal**

When invasive species are encountered within the Project Area they will be stripped and immediately removed. Cut plant material will be placed in heavy duty, 3 mil or thicker, black contractor quality plastic cleanup bags. Bags will be securely tied and transported from the site in a truck with a topper or cap in order to prevent spread or loss of the plant material during transport from the control work site to an appropriate staging or disposal location. Cut vegetation will not be disposed into native cover areas. Machinery and equipment used in this removal will then be pressure washed before leaving the invasive species affected area.

### **5.3 Top Soil Removal**

Top soil containing invasive species will be stripped and immediately removed from the Project Area. Loads will be covered to prevent windborne dispersal of invasive vegetation. No disposal or transfer of excess spoils or cleared top soil into native cover areas will be allowed. Machinery and equipment used in this removal will then be pressure washed before returning to the proposed Marble River Wind Farm.

### **5.4 Wash Machinery and Equipment**

All machinery and equipment to be used in the construction of the proposed Project, including but not limited to trucks, tractors, excavators, and hand tools such as shovels, rakes, hoes, picks, and etc., will be washed with high pressure hoses and hot water prior to delivery to the site, to insure they are free of invasive species. The environmental inspector will check that all trucks and equipment have been washed prior to first use, and that there is no dirt or plant material clinging to the wheels, tracks, or undercarriage of the vehicles or equipment.

### **5.5 Erosion Control**

The environmental inspector will ensure that contractors use only certified weed-free straw and mulch for erosion control. Appropriate erosion controls will be employed to reduce migration of non-native vegetation. On bare surfaces, contractors will be required to reestablish native vegetation and to use weed-free mulch to minimize weed germination.

### **5.6 Preserve and Restore Native Vegetation**

Impacts on native vegetation will be avoided or minimized to the extent practicable. Wetland areas and riparian zones temporarily impacted during the construction of the wind farm will be restored to pre-construction contours and revegetated with native (non-invasive) plant material or seeds immediately following the completion of regulated activities at each site. This revegetation effort will ensure adequate vegetative cover to prevent the colonization of invasive species. Top soil stripped from a site that contained a community of invasive species will not be stored, disposed of, or respread in or adjacent to a wetland or riparian zone. Where hydrologic features have been temporarily disturbed, the original surface hydrology will be restored. Clean top soil obtained from a source known to be free of invasive species propagules will be used. An appropriate native seed mixture will be selected based on pre-disturbance surveys. All seed will be from local sources, to the extent possible dependant upon seed availability, and applied at recommended rates. Cleaning and maintenance of construction equipment also will minimize contact with sources of weed seed in areas not yet revegetated.

## **6.0 POST CONSTRUCTION PHASE**

### **6.1 Control Methods**

The following methods of invasive species control, including those specific to the species observed on site listed in Table 6-1, may be employed to manage invasive plant communities (if other invasive species are discovered, the Marble River staff will consult with NYSDEC regarding the most effective means of control):

#### **6.1.1 Physical Control**

- Determine if the site and invasive species are appropriate for mechanical or manual control methods; and
- Implement physical control methods on species that are known to respond to such treatment.

#### **6.1.2 Chemical Control**

- Determine effectiveness of herbicide application on the invasive plant species, including application rates, techniques, timing, combination with other control methods, and impacts to non-invasive plant communities;
- Implement chemical control methods in areas where herbicide is most effective;
- In all cases and for all herbicides, directions for use and restrictions found on the label will be followed;
- All herbicides will be applied by a New York State Certified Applicator or Technician in an appropriate category;
- In wetlands with standing water only the RODEO® glyphosate formulation will be used;
- In wetlands with no standing water either the RODEO®, ROUNDUP® or the AQUAMASTER® formulation may be used; and
- In uplands either ROUNDUP®, AQUAMASTER® or GLYPRO® will be used.

#### **6.1.3 Cultural Control**

- Determine if construction and/or maintenance activities have facilitate introduction and spread of invasive species;
- Implement preventative measures, such as equipment washing and/or area-specific closures, to reduce spread;
- Make sure that bare soil is revegetated with native species wherever practical; and
- Defer soil disturbance until invasive species are under control.

**Table 6-1  
Species Specific Control Methods**

<b>Plant Species</b>	<b>Early Spring</b>	<b>Spring</b>	<b>Early Summer</b>	<b>Summer</b>	<b>Late Summer</b>	<b>Fall</b>	<b>Comments</b>
Common Reed				C	S	S	Summer mowing only on sites that become dry during the summer. Cutting at the wrong time can increase stand density. Remove cut shoots to prevent re-spouting. September is best time to cut and apply Glyphosate-based herbicide.
Purple Loosestrife	D, P	D, P	F	F	F, P		Pull or spray before seeds set in summer. Remove entire root; broken stems can re-sprout. Glyphosate-based herbicide may be applied directly to the plant in a low volume and must be specified for use in wetlands.
Reed Canary Grass	C, F	C, F	F	F	F		For small stands, spray with Glyphosate-based herbicide and cover treated areas with black plastic. Frequent mowing after herbicide application may be effective. Later applications of herbicide needed to control seedlings.

Key: C = Cut to the ground; D = Dig to remove all roots; F = Spray foliage with herbicide; P = Pull to uproot in moist soils; S = Apply a drop of herbicide in a newly cut hollow stem; T = Brush on herbicide to a freshly cut stem

## **6.2 Monitoring Program**

Monitoring for the presence of invasive species will be integrated into the wetland mitigation site monitoring program for at least the first five years post-construction. Restoration monitoring will be conducted continuously at the permanently impacted sites by routine inspections conducted by Marble River staff, and bi-annually during the growing season by conducting qualitative surveys for invasive species populations throughout the Project Area for comparison to the baseline survey completed prior to the commencement of construction activities. The first survey after construction will identify invasive plant communities and locate any new weed infestations. Thereafter, surveys may be conducted aurally with spot ground checks in areas of infestation.

## **7.0 REPORTING**

Marble River will provide the NYSDEC with a restoration monitoring report detailing the status of invasive plant species and all measures taken to control the invasive vegetation by December 31 of each monitoring year. This report will be submitted as an attachment to the wetland mitigation monitoring report, which documents the success of the wetland mitigation area development.

## **8.0 REFERENCES**

The Global Invasive Species Database (<http://www.issg.org/database/welcome/>)