



# **PRELIMINARY OPERATION AND MAINTENANCE PLAN**

Watkins Glen Solar Energy Center

Schuyler County, New York

**FACILITY OPERATOR:**

Watkins Glen Solar Energy Center, LLC

700 Universe Boulevard

Juno Beach, FL 33408

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## **1.0 Overview**

This Preliminary Operation and Maintenance (O&M) Plan (Plan) has been developed to establish a maintenance and management schedule intended for use at the Watkins Glen Solar Energy Center (or the Project) to ensure safe work practices and minimize potential hazards during operation. This Plan is specific to solar development and the nature of this Project. This Plan presents and identifies the commitment of Watkins Glen Solar Energy Center, LLC (the Applicant) to instill safe work practices while completing routine maintenance at the Facility. The operation and maintenance procedures outlined in this Plan are designed to prevent and/or minimize adverse impacts to the surrounding environment and local community within the Project Area to the maximum extent practicable.

## **2.0 O&M Purpose**

The Applicant has prepared this Plan to follow all applicable requirements of Stipulation 5 of the Watkins Glen Solar Energy Center proposed Stipulations (dated February 21, 2020), related to facility maintenance and management plans, procedures, and criteria. Watkins Glen Solar Energy Center, LLC is a limited liability company formed on August 25, 2017 in Delaware, and will develop, own, operate, and maintain a wholesale, solar-powered generating facility in Schuyler County, New York. Watkins Glen Solar Energy Center, LLC is a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC (NextEra). As such, the Project will directly contribute to NextEra's reliable reputation in the energy industry by providing clean, renewable energy.

NextEra is a nationally recognized clean energy provider with a portfolio of facilities totaling over 21,900 MW of generating capacity in the United States and Canada, of which over 2,600 MW is derived from the sun. NextEra operates its facilities with respect for the environment and supports communities; 99 percent of NextEra's electricity is derived from clean or renewable sources, including solar and wind.

## **3.0 Solar Technology**

The Project will utilize solar arrays as a result of various factors including, but not limited to, market competition, tax incentives, industry trends, availability of panels, and solar resource suitability/characteristics of the site. Shade and tilt factors were also considered when determining whether tracking or fixed panels were appropriate for the Project. The selected technology, a monocrystalline solar tracker panel system, is one of the most efficient models currently available.

## 4.0 Maintenance Schedule

Scheduled and unscheduled safety and service inspections will be conducted for the electrical system, including, but not limited to the substation and collection system. The inspections will be conducted in accordance with all applicable engineering, design, and manufacturing standards. Routine inspections may occur in the form of ground patrols, aerial patrols, Light Detection and Ranging (LiDAR), and/or imagery analysis. North American Electric Reliability Corporation (NERC) applicable lines and lines designated as critical to the reliability of the electrical system shall be inspected at least annually, with no more than 18 months between inspections. The inspection, testing, and commissioning procedures detailed below will be necessary, at a minimum, for the proposed substation and collection system. Table 1 details the preventative maintenance tasks and schedule.

### ***Collection System***

- Abiding by employee safety requirements;
- De-energized verification to ensure no current is flowing through panel electrical components;
- Confirming all protective equipment has been properly installed;
- Verifying all wires and cable have been routed properly without sharp bends;
- Checking that all fuses, connections, safety switches, breakers, inverters, and all other systems/components are appropriately installed and securely fastened;
- Ensuring that there are no short circuits or short protections to confirm components are ready to receive power; and
- Panel and inverter testing.

### ***Substation***

- Visual, mechanical, and electrical testing of power transformers and high-voltage breakers;
- Testing of all metering units;
- Testing of all surge breakers, transformers, switches, relays, computer systems, valves, and other instruments;
- Switchgear and switchboard inspections and testing;
- Testing and diagnostics of all cables;
- Testing of the grounding systems; and

- Substation integration into the data collection system.

The timing, frequency, and overall number of inspections conducted may be adjusted in order to respond to changing conditions such as fuel loading, heavy rainfall, high winds, severe weather events, landowner intervention, and tree mortality due to disease outbreaks or insect infestations.

#### **4.1 Vegetation Maintenance Overview**

Vegetation maintenance and management of the Project Area has been incorporated into this Plan to establish a vegetation management schedule for the solar arrays, collection lines, collection substation, and access roads, as necessary. Routine vegetation management prevents potential outages associated with vegetation on or near the Facility components and adverse environmental impacts.

Vegetation maintenance will occur to plants that are incompatible with the Applicant's objectives detailed below:

- **Transmission Reliability** – The electrical service reliability through vegetation control regardless of accessibility or workability.
- **Minimizing Fire Hazards** – Identifying potential problems and reducing the electric current levels to acceptable limits.
- **Compliance** – Ensuring compliance with the Article 10 certificate conditions and best management practices (BMPs) approved thereunder, the Invasive Species Management and Control Plan (ISMCP) (see Exhibit 22), applicable laws and regulations, and industry standards.
- **Resource Management** – Control Project resources by identifying workload.
- **Mechanical means** such as mowing and weed whacking will be the primary method employed to control vegetation. Herbicide treatments, if necessary, will be a secondary method and applied only on an as-needed, spot, or selective basis, allowing for allocated resources to be utilized efficiently. Aerial or broadcast spraying will not be employed, therefore work load and resources will be balanced.
- **Improving/Maintaining Accessibility** – Controlling vegetation on and around Project components and access roads, where practical, to promote accessibility. NYSEG will

maintain the right-of-way (ROW) under the 115-kV line tying the Point of Interconnection (POI) switchyard to the existing transmission line.

#### ***4.1.1 Practices and Prescriptions***

The vegetation management practices aid in managing plant communities by identifying compatible and incompatible vegetation. The evaluation, selection, and implementation of the appropriate control method(s) shall be considered in order to meet a desired objective. Factors such as environmental impact, anticipated effectiveness, site characteristics, security, economics, and current land use should be considered when selecting the control method(s). The methods may include, but are not limited to, moving, pruning, weed whacking, and plant removal. Selective spot applications of herbicides may be used if necessary, using New York State Department of Environmental Conservation (NYSDEC) approved products and treatment methods. Additional information regarding the control methods is provided below.

Additionally, by providing these management practices and prescriptions for planted and invasive vegetation, the survivability rates of the native and proposed pollinator plant species will increase. Appropriate maintenance and monitoring also eliminates plant competition allowing for healthier foraging habitats, which in turn creates a beneficial environment and impactful plant growth patterns for the pollinator species.

**Mowing/Brush Removal (Primary Method):** Vegetation shall be mowed at least twice per year (typically 2 – 6 annual mows, depending on conditions) within the array fence lines during operation and maintenance of the Project. The vegetation shall not grow over the height of the lowest portion of the panels in order to prevent shading of the panels or electrical issues with the panels. Vegetation immediately outside of the fence lines shall be mowed, maintained, or brush-hogged periodically to prevent shading and to allow for maintenance activities along the fence line. This brush removal and trimming is anticipated to occur every two to three years. Mowing clippings and removed brush/vegetation will remain on site.

#### **Herbicides (Secondary Method):**

Herbicides may be used as a secondary means of control where necessary. Spot treatments will be employed to target specific discrete locations; broadcast or aerial application of herbicides is not proposed. If necessary, herbicides are only anticipated to be used to prevent potential fire hazards

and to treat invasive species. All herbicide use will comply with the regulations and requirements of the NYSDEC Pesticide Control Regulations. The NYSDEC requires that application of herbicides be made under the direct supervision of a New York State (NYS) Certified Applicator who either owns or is employed by a business or agency registered with NYSDEC for the purpose of herbicide application. All herbicides used will have valid registrations with both United States Environmental Protection Agency (USEPA) and NYSDEC. Application of herbicides will conform to all label instructions and all applicable state and federal laws and regulations.

#### ***4.1.2 Inspection Schedule***

Vegetation inspections will include periodic inspections for invasive species and will follow the ISMCP for the Project (Exhibit 22). Site checks will be confined to the limits of disturbance, with some exception to checks warranted within other portions of the Project Area. Site checks will include ensuring stable ground conditions, functioning stormwater management features, and identifying perimeter landscaping necessary to maintain effective visual screening intended for the Project.

Special attention to ground cover, landscaping features, and more frequent checks will occur for stormwater management features during the initial operation phase of the Project. Seeded areas will be checked for establishment during initial site seeding and the addition of topsoil or reseeded implemented as necessary. Identification of faster growing weeds and invasive species will be prioritized to ensure the seeded mix becomes well established as the primary ground cover. Site checks will occur more often, as necessary, to address concerns and/or action items noted in previous invasive species reports and in areas where invasive species occur.

#### ***4.1.3 Inspection Elements***

The following elements will be implemented during scheduled inspections in order to maintain unimpeded operation of the facility, promote stable ground conditions, meet vegetation maintenance and compliance objectives, and control invasive species.

Regularly planned routine inspections:

- Excessive growth of ground cover grass or weeds;
- Strive to keep vegetation below bottom edge of photovoltaic (PV) modules;
- Bare spots and/or excessive weed growth;

- Condition of landscaped trees (signs of stress);
- Deterioration of erosion control and stormwater management features;
- Vegetation that impedes on facility equipment;
- Condition of the wetland vegetation;
- Signs of uncontrolled runoff or sedimentation;
- Signs of damage to the perimeter fence due to vegetation growth;
- Trash and debris;
- Inspections for invasive species per ISMCP; and
- Check road conditions and signs of mud tracking off-site and address accordingly.

Periodic mowing and repairs to grassed areas:

- Based on actual observed growth (typically maintained to below 18-24");
- Approximately 3–6 mows annually depending on conditions;
- Avoid mowing while ground is wet or with 24-48 hours after heavy rain;
- Mow fenced area and between solar panel rows;
- Mow as needed just outside fence (about 5 to 15 feet);
- Mow select landscaped areas as needed to promote tree growth;
- Add or repair stakes and support cables for newly planted trees, as needed;
- After full growth, trimming of shrubs and landscaping trees may be required;
- Trim targeted storm water management features and ditches;
- Trim around and within substations;
- Repair bare soil or eroded areas as necessary; and
- Check for and remove loose debris.

Periodic selective herbicide treatment:

- Only USEPA and NYSDEC-approved products; and
- Used to support vegetation management efforts as explained above.

Periodic management of perimeter landscaping:

- Trim branches as needed;
- Repair stakes and guide strings; and
- Remove dead or fallen trees and limbs, as needed.



Periodic repairs to stormwater management and erosion control features as necessary, which may include vegetation management measures.

#### ***4.1.5 Communication of Imminent Outage Threat Cause by Vegetation***

The Applicant will communicate with the appropriate control center in the event of an imminent threat due to vegetative conditions.

##### Immediate Communication Requirements for the Applicant's Employees and Contractors:

Imminent threats due to a vegetation condition shall be promptly reported to the Applicant's vegetation specialist. The specialist will verify the distance of the vegetation issue to the conductor. After the imminent threat is confirmed, the specialist will contact the appropriate control center and area operations. The specialist, control center and/or area operations shall jointly determine a resolution in a timely fashion.

##### Action:

Following notification of the imminent threat to the appropriate personnel, maintenance actions shall be delegated to the appropriate personnel to remediate the emergency. The Applicant's top priorities are safety of Project personnel and the public and system reliability. Actions such as line load reduction or taking the line out of service may be necessary until the vegetation threat has been addressed.

##### Documentation:

Vegetation specialists shall maintain a detailed log of the vegetative threat event until work is completed. The reporting documentation shall be maintained by the Applicant's Vegetation Management team.

## **5.0 Inspection Records**

During operation of the Facility, observed conditions which require maintenance and have been identified through the inspection process, shall be recorded, and stored electronically. The records shall identify and prioritize maintenance needs based on the risk of reliability for each Project Component. The inspection shall be documented electronically and shall indicate the name of the inspector and the date in which the inspection occurred.

## **6.0 Maintenance Implementation**

### Tracking:

The Applicant's maintenance team will review the progress of inspection and upcoming scheduled work on a monthly basis to establish an overall work plan. Resource movement or relocation and schedule adjustments shall be made as necessary to ensure the work plan objectives are met. The Applicant will ensure the items listed on the work plan are completed by the end of the respective calendar year.

### Quality Assurance and Auditing:

Contractors shall certify their work has been completed to specification upon completion of the work. The work shall be inspected and documented in a database by the Applicant's employee or representative.

### Documentation:

The work plan shall be documented in a database by the Applicant's employee or representative. Reports will be monitored to ensure the work plan is complete and exceptions to the plan have been noted. The documentation from the database will be archived for future reference once the work plan is completed.

## **7.0 Quality Assurance, Quality Control, and Independent Patrol**

### Quality Assurance and Quality Control (QAQC):

A random, statistically representative sample of open, scheduled and completed work will be selected and reviewed annually to improve our ability to capture and assess performance improvement opportunities.

QAQC and Independent Patrol will enable the Plan to assess the overall management of the Project Area and promote continuous improvement.

## **8.0 Safety**

Operational staff personnel shall be familiar with the Site Security Plan (see Appendix 18-1) and the Emergency Response Plan (See Appendix 18-2) established for the Project. Project personnel designated to conduct inspections or maintenance operations shall complete the necessary training to carry out their assigned task(s). Inspection and maintenance personnel must

wear the appropriate personal protective equipment (PPE) required for their identified task(s). NextEra's Safety Information Management System will document any/all injury events, unsafe conditions, and near misses related to the operation of the Project. The records will be utilized to develop and implement corrective measures for newly identified hazards and prevent future hazards at the Project.

**Table 1. Maintenance Schedule – Facility Components**

<u>Service Description</u>	<u>Service Frequency</u>
<b><u>Solar Field</u></b>	
<b>Panels</b>	
Module Inspection	1 Week
Module Cleaning	As Needed
Thermography (IR) Scan	12 Months
String Current Checks	1 Month
<b>Inverters</b>	
Inspection	1 Week
Cleaning/Torque checks	12 Months
HVAC Inspection	1 Week
HVAC Maintenance	12 Months
HVAC Condenser Coil Cleaning	6 Months
<b>Pad Mounted Transformers</b>	
Inspection	1 Week
IR Scan	12 Months
Oil Sample	12 Months / As Needed
<b><u>Control Room/Switchyard</u></b>	
<b>Control Room</b>	
Inspection	1 Week
Battery Cell Test	6 Months
HVAC Inspection	1 Week
HVAC Maintenance	6 Months
<b>Substation</b>	
Inspection	1 Week (Manned) / 1 Quarter (Unmanned)
Substation IR Scan	12 Months
SF6 Breaker Maintenance (Minor)	6 Years
SF6 Breaker Maintenance (Major)	As Needed
Transformer Oil Sample	12 Months
Revenue Meter "A" Phase Calibration	12 Months
Revenue Meter "B" Phase Calibration	12 Months

**Table 1. Maintenance Schedule – Facility Components**

<u>Service Description</u>	<u>Service Frequency</u>
<u>Solar Field</u>	
<u>Safety</u>	
Site Safety Audit	1 Month
Site Safety Assessment	12 Months
First Aid Kit Quantity Inspection	1 Month
Fire Extinguisher Inspection	1 Month
Fire Extinguisher Recertification	12 Months
Protective Grounds Recertification	12 Months
Voltage Rated Glove Recertification	6 Months
Switch Stick Recertification	2 Years
<u>Administrative</u>	
Spare Parts Inventory	3 Months (Partial Count)
Spare Parts Inventory	12 Months (Full Count)
SCADA Inspection	Daily
SCADA Maintenance	1 Month
PI/Historian Inspection	Daily
PI/Historian Maintenance	1 Month