



## Department of Environmental Protection

Central Regional Office • 627 Main Street, Worcester MA 01608 • 508-792-7650

DEVAL L. PATRICK  
Governor

TIMOTHY P. MURRAY  
Lieutenant Governor

RICHARD K. SULLIVAN JR.  
Secretary

KENNETH L. KIMMELL  
Commissioner

### **BWP SW 36 POST-CLOSURE USE – MAJOR**

Norfolk Landfill: Solar Project

and

### **LANDFILL CLOSURE COMPLETION**

Permit Issuance Date: December 21, 2011

Name of Permittee: Town of Norfolk  
33 Medway Branch  
Norfolk, Massachusetts 02056

Name of Facility: Norfolk Landfill (“Facility” or “Landfill”)  
Facility Address: 33 Medway Branch  
Norfolk, Massachusetts 02056

MassDEP Region: Department of Environmental Protection (“Department” or “MassDEP”)  
Central Regional Office (CERO), Worcester  
Division of Solid Waste Management

Permit Number: X239659 (Transmittal No.)

Facility Number: 37008  
MassDEP Classification: CLF

## **I. FACILITY DESCRIPTION AND OUTSTANDING APPROVAL STATUS**

### **A. Facility**

1. Owner: Town of Norfolk  
33 Medway Branch  
Norfolk, Massachusetts 02056
2. Operator: Constellation Solar Massachusetts, LLC  
100 Constellation Way, Suite 600C  
Baltimore, Maryland 21202
3. Description: The Landfill occupies approximately 18 acres identified as Parcel D on a 54.7 acre site assigned area of land in Norfolk, Massachusetts. The Landfill

was capped in 1997. The areal limit of the proposed solar panel installation is approximately 2.55 acres on top of the capped Landfill. The Town is constructing an additional solar array project, off the Landfill, on site assigned land to the east of the capped Landfill. The Town also operates a small transfer station which is to the southeast of the Landfill, and the other solar array project east of the capped Landfill.

**B. Reviews and Approvals Affecting Current or Planned Operation.**

1. MEPA: Not Applicable
2. Site Suitability Report: Not Applicable
3. Site Assignment: September 14, 1978 and corrected by Norfolk Board of Health on May 24, 1983
4. BWP SW 25 Corrective Action Design, Plan Approval and Authorization to Construct, Norfolk Sanitary Landfill, Transmittal No. W000241  
Issued by MassDEP-NERO: July 11, 1997  
Amended by MassDEP-NERO: August 21, 1997

Closeout Documentation, Norfolk Landfill Closure,  
Norfolk, Massachusetts

Prepared by:

Sterns & Wheler, LLC

24 New England Executive Park

Burlington, MA 01803

Wayne C. Perry, P.E

Dated: July 15, 1998

Received by MassDEP-NERO: July 20, 1998

BWP SW 23 Comprehensive Site Assessment (CSA), Addendum

Received by MassDEP-NERO: April 21, 2006

Approved by MassDEP-NERO: June 14, 2006

Permit for BWP SW 37 Post-Closure Use – Minor,

“Norfolk Landfill- Solar Project” (Phase I Eastern Array)

Permit No.: X239663

Permit Issued by MassDEP-CERO: November 4, 2011

**C. Permit Application Information for BWP SW 36 Post-Closure Use – Major**

1. Applicant Name:

Constellation Solar Massachusetts, LLC  
100 Constellation Way, Suite 600C  
Baltimore, Maryland 21202

2. Transmittal Number: X239659 (Permit No.)

3. Start Date of Application: September 8, 2011

4. Date of Fee Receipt: September 7, 2011

5. Consulting Registered Professional Engineer:

Norfolk Ram Group, LLC  
One Roberts Road  
Plymouth, MA 02360  
Contact: Wayne C. Perry, P.E.  
Tel.: 508-747-7900 ext. 193

6. Title of Plans & Reports, Submission and Date of Receipt at MassDEP-CERO:

Permit Application for BWP SW 36 Major Post-Closure Use Permit for  
Norfolk Landfill Solar Project, Norfolk, MA  
Prepared by: Norfolk Ram Group, LLC  
Dated: September 2011  
Received by MassDEP-CERO: September 6, 2011

Supplemental Documentation titled “Closeout Documentation, Norfolk  
Landfill Closure, Norfolk, Massachusetts”  
Prepared by: Sterns & Wheler, LLC, Wayne C. Perry, P.E.  
Dated: July 15, 1998  
Submitted by: Norfolk Ram Group, LLC, Wayne C. Perry, P.E.  
Received by MassDEP-CERO: September 16, 2011

Supplemental Documentation including:  
Revised Plans titled “Town of Norfolk Solar Project” prepared by Norfolk  
Ram Group, LLC dated September 2011, Revised October 2011,

Revised Geotechnical Engineering Report titled “Town of Norfolk Phase 2 Solar PV Array”, prepared by McArdle Gannon Associates, Inc. dated August 2011, Revised December 7, 2011  
Received by MassDEP-CERO: December 12, 2011

7. Project Description:

The post-closure use request is for the installation of a 550 kilowatt (KW) photovoltaic (PV) solar panel project (“Landfill Array”) on the capped Landfill owned by the Town of Norfolk. The solar panels will cover approximately 1.58 acres. The areal limit of work for the Landfill Array will involve approximately 2.55 acres. The Town of Norfolk proposes to construct and maintain a solar PV array system on the capped Landfill consisting of the following components:

- Approximately 2,000 PVMax3 photovoltaic solar panels supported on concrete ballast mounted racking systems installed above the existing surface of the capped landfill cover system.
- Transmission lines from the panels via cable trays installed above the surface of the landfill on the concrete ballasts and shall not penetrate the landfill cap.
- Subsurface transmission lines beyond the footprint of the Landfill to a transformer station constructed adjacent to an existing Norfolk DPW metal building located south of the Landfill on Medway Branch.
- Interconnection equipment at the transformer station to transfer power to the grid via utility poles on Medway Branch.
- A perimeter fence installed around the entire capped Landfill that will provide site security.

This post-closure use permit authorizes the installation and maintenance of the proposed solar array on the capped Landfill, appurtenances on the Landfill and appurtenances thereto. It does not apply to the solid waste transfer station that is operated by the Town to the southeast of the Landfill or to the solar array project, Permit No. X239663, constructed off the Landfill, on site assigned land to the east of the capped Landfill.

## **II. POST-CLOSURE USE – MAJOR, APPLICATION REVIEW AND APPROVAL LANDFILL CLOSURE COMPLETION APPROVAL**

The application was submitted to request authorization to install and operate a PV solar array on the capped Landfill (Landfill Array). The Department reviewed the closure status of the Landfill and requested additional information which was submitted as supplemental information.

The permit application and supplemental documentation for Landfill Closure Completion complies with the requirements set forth in 310 CMR 19.140: Landfill Closure Requirements. This permit meets the criteria set forth in MassDEP's Landfill Technical Guidance Manual dated May 1997. The applicant's request for an approval of a Landfill Closure Completion is approved based on the submission of the information detailed in Section I C 6, above. In accordance with authority granted pursuant to Massachusetts General Law chapter 111, Section 150A, MassDEP hereby certifies landfill closure completion of the Norfolk Landfill subject to applicable requirements set forth at 310 CMR 19.142: Landfill Post-Closure Requirements.

Based upon review of the documentation, the Department has determined that the Landfill closure is complete and that the post-closure use is appropriate. For the purposes of this Permit, the Town of Norfolk and Constellation Solar Massachusetts, LLC (Owner/Operator) are considered "Permittees".

The permit application for the Landfill Array complies with the application requirements set forth at 310 CMR 19.016: Post-Closure Use and 19.143: Post Closure Use of Landfills, and was reviewed in accordance with 310 CMR 19.037: Review Procedure for Existing Facility Permits, Permit Modifications, Permit Renewals and other Approvals. The plans and reports described above establish that the submittal complies with the criteria set forth in the review process at 310 CMR 19.038: Applicability and Review Criteria for a Permit or Permit Modification and 310 CMR 19.143: Post-Closure Use of Landfills.

This is a Permit, issued pursuant to Massachusetts General Laws (MGL) Chapter 111, Section 150A and 310 CMR 19.000, the Solid Waste Management Facility Regulations (the "Facility Regulations") and is subject to the conditions set forth below. In the event this Permit conflicts with all or parts of prior plan approvals or permits issued pursuant to Chapter 111, Section 150A or solid waste regulations in effect prior to July 1, 1990, the terms and conditions of this Permit shall supersede the conflicting provisions of the prior permits and/or approvals. This Permit does not convey property rights of any sort or any exclusive privilege.

### III. GENERAL PERMIT CONDITIONS

- A. Compliance with Plans** - The Permittees shall assure that the Facility, Landfill Array and appurtenances thereto are operated in accordance with approved plans, reports, and other submissions described in Section I, except as may be modified by the conditions set forth in Section IV. No material changes in the design or activities described in the approved documents shall be performed without prior written MassDEP approval.
- B. Compliance with Other Approvals** - The post-closure use of this Facility, Landfill Array and appurtenances thereto shall be in compliance with other applicable local, state and federal laws and regulations.
- C. Standard Conditions** - The Facility, Landfill Array and appurtenances thereto shall be maintained in accordance with the conditions set forth at 310 CMR 19.007-19.011 and 19.043(5).
- D. Joint Liability** - This Permit is issued subject to the conditions of joint liability of the Permittees in accordance with 310 CMR 19.043(3).
- E. Transfer** - No transfer of the Permit shall be permitted except in accordance with 310 CMR 19.044.
- F. Permit Modification** - MassDEP reserves the right to rescind, suspend or modify this Permit by the imposition of additional conditions based upon a determination of actual, or the threat of, adverse impacts from the maintenance, closure or post-closure use of the Facility, Landfill Array and appurtenances thereto.
- G. Electronic Submissions** – MassDEP requires that all reports, periodic submissions and notices be submitted electronically with the identifying Permit No. X239659, town and title of the submission to [mDEP.CentralRegion@state.ma.us](mailto:mDEP.CentralRegion@state.ma.us).

### IV. SPECIFIC PERMIT CONDITIONS

- A. Criteria for Post-Closure Use** - This approval for post-closure use of the Norfolk Landfill shall be accomplished such that all activity associated with the Facility, Landfill Array and appurtenances thereto, as described in the application shall not in any way alter the integrity of the Landfill cover system or the site environmental monitoring systems located anywhere on the site assigned land off of Medway Branch.

- B. Post-Closure Environmental Monitoring** - The Permittees shall maintain the existing and/or any future environmental control or monitoring systems in accordance with 310 CMR 19.133: Maintenance of Environmental Control and Monitoring Systems. Historic, environmental monitoring associated with the Landfill shows ongoing detections of methane gas above the lower explosive levels at the DPW offices across Medway Branch and along the access road located on the site assigned property.

As specified in Minor Post-Closure Use Permit No. X239663 for the eastern solar array project, the Owner/Operator shall install additional gas monitoring wells between the Landfill and the eastern (Phase I) solar array project prior to the beginning of construction of these projects and notify MassDEP when the gas monitoring wells have been installed. The owner/operator shall include these new wells in subsequent environmental monitoring activities and shall maintain the existing and/or any future environmental control or monitoring systems in accordance with 310 CMR 19.133.

- C. Financial Assurance** - The Town of Norfolk shall maintain post-closure financial assurance in accordance with the requirements set forth at 310 CMR 19.051, assuring that sufficient funds are available to cover post-closure maintenance and monitoring of the Landfill, and any additional costs to maintain, repair and restore the cap that may be associated with the operations approved by this Permit. Construction of the Landfill Array shall not begin until an approved financial assurance mechanism (FAM ) is in place. A proposed FAM shall be submitted to the Department within thirty (30) days from the date of issuance of this Permit.

- D. Other Post-Closure Use** - The Landfill shall not be used for any other post-closure activity without submittal and Department approval of a Post-Closure Use Permit Application in accordance with 310 CMR 19.143: Post-Closure Use of Landfills.

- E. Inspection and Repair of Settlement Areas:** Prior to construction of the Landfill Array, any suspect settlement areas on the Landfill shall be surveyed to determine the lowest spot. The surrounding area shall be then surveyed to find the “relief point” defined as the lowest surrounding area where ponded water would flow out. The elevation difference is defined as the “pond value”. Minor settlement shall be defined as a pond value of less than 12 inches. Any Landfill project area that has undergone minor settlement shall be corrected by the placement of additional vegetative support soil to promote runoff and the area shall be reseeded. Any area repaired shall be surveyed and the location marked on a plan with the pond value. Any future settlement shall be recorded cumulatively. If/when the total settlement reaches 12 inches the area will be considered to have suffered major settlement and appropriate repairs must be undertaken to eliminate ponding. Any proposal to repair minor settlement may be done as routine maintenance, provided that the owner/operator reports the settlement to MassDEP and states its intent to perform repairs, and provides MassDEP with final survey (as-built) results and a summary write-up.

Major settlement is defined as a pond value of greater than 12 inches. When this occurs, the final cover system must be repaired subject to MassDEP approval to prevent surface water ponding.

Any proposal to remedy a major settlement repair must be submitted within a Corrective Action Design (BWP SW 25) permit application since disruption of the final cover system will take place and repair details must be submitted and approved.

Continued monitoring for potential differential settlement due to the Landfill Array shall be provided for during Facility operations along with established provisions for addressing and adjusting for such settlement within the landfill cover system and/or the Landfill Array system.

- F. Notification of Construction:** The Owner/Operator shall notify MassDEP in writing (e-mail is acceptable to [Lynne.Welsh@state.ma.us](mailto:Lynne.Welsh@state.ma.us)) when the post-closure use construction commences and is completed.
- G. Certification Report:** Within ninety (90) days of completing the installation of the Landfill Array, MassDEP shall be provided with a certification report. All construction work shall be completed under the supervision of a Massachusetts Registered Professional Engineer who shall have sufficient staff on-site to provide quality assurance/quality control (QA/QC) oversight for all construction work associated with the project. The report shall include, at a minimum, written certification from the supervising engineer that the project was performed in accordance with MassDEP regulations, applicable requirements and the approved Post-Closure Use Permit. The report shall include as-built drawings depicting all pertinent site features and the extent of the Facility. Landfill Array and appurtenances thereto.
- H. Personnel Training:** The Owner/Operator and their contractor(s) shall be instructed regarding the potential hazards associated with landfill gas and shall instruct or give on-the-job training to all personnel involved in any activity authorized by this Permit. Such instruction or on-the-job training shall teach personnel how to comply with the conditions of this Permit to carry out the authorized activity in a manner that is not hazardous to public health, safety, welfare or the environment. Training shall be provided to workers conducting monitoring and maintenance activities for the Landfill regarding potential hazards associated with the Landfill Array including but not limited to electrical hazards.
- I. Health and Safety:** The Owner/Operator and their contractor(s) are responsible to ensure all necessary precautions are taken to protect the health and safety of workers and the general public during both construction and maintenance of the Landfill Array. Because landfill gas has been detected in soil-gas monitoring probes located around the Landfill's perimeter, a copy of the site-specific health and safety plan for the



construction of the Landfill Array shall be submitted to MassDEP (for its files) prior to the beginning of any construction work which shall include protocols for monitoring of landfill gas (i.e. methane, hydrogen sulfide, etc.) as needed, protocols for modifying work practices if landfill gas is detected at the project site at levels deemed unsuitable, protocols for workers entering any potential enclosures, and protocols for responding to any landfill gas conditions.

- J. Integrity of the Final Cover System:** All disturbances of the Landfill shall be limited to the proposed installations on top of the vegetative cover of the capped Landfill. No significant excavations or other penetrations shall be performed into the final cover system during construction or during operation and maintenance of the Landfill Array without MassDEP approval. The Owner/Operator shall ensure that vehicles operating on the Landfill do not damage or compromise the Landfill final cover system integrity. There shall be no penetrations of any kind of the HDPE layer of the final cover system.

**K. Construction Precautions:**

1. All necessary precautions shall be taken to ensure that the proposed construction and maintenance work associated with the Landfill Array does not damage the environmental monitoring network at the Landfill. Prior to the commencement of construction activities, environmental monitoring locations shall be flagged for visibility and permanently protected with a vehicle proof barrier. If any damage occurs to the environmental monitoring network components, the Owner/Operator or their contractor(s) shall notify Lynne Welsh, Acting Section Chief, MassDEP-CERO within 24 hours and provide a written plan for repairs, including a schedule.
2. Landfill gas has been detected in soil-gas monitoring probes located around the Landfill's perimeter during the post-closure monitoring period. This Permit requires that any installed subsurface utilities be designed to address the safety concerns (explosion, fire, asphyxiation hazard, etc.) associated with subsurface landfill gas soil-gas migration. Any inverter/ transformer pad or appurtenances must be designed so as not to create a potential fire safety hazard. Potential design features may include but are not limited to the installation of fully sealed conduits, explosion proof connections, and fittings. Utility trenches shall also be designed so they do not act as a conduit for landfill gas migration.

- L. Transformer Pad and Interconnection Equipment:** A copy of the proposed final design for the transformer pad and any other electrical and protective switchgear (interconnection equipment) proposed on-site shall be submitted to MassDEP for its files. The Owner/Operator and their contractor(s) are responsible to ensure that utilities/structures will not accumulate landfill gas during construction and operation of the project.

**M. Other Requirements:** The Owner/Operator and their contractor(s) are responsible to ensure that the proposed work complies with all applicable local, state and federal electrical codes and permits, including the National Electrical Code (NEC), 2011 Edition, Article 690 – “Solar Photovoltaic (PV) Systems”. MassDEP notes that Article 690.31(a) “Wiring Systems” of the NEC states that “Where PB source output circuits operating at maximum system voltage greater than 30 volts are installed in readily accessible locations, circuit conductors shall be installed in a raceway”.

**N. Landfill Gas Notification Requirements:**

1. As specified in solid waste management regulations at 310 CMR 19.132 (4) (g): Gas Monitoring,

"When, at any time, the concentration of explosive gasses exceeds 10% of the lower explosive limit (LEL) in any building, structure, or underground utility conduit, excluding gas control, gas recovery and leachate collection system components, the owner/operator shall:

- a) take immediate action to protect human health and safety;
- b) notify the Department's Acting Solid Waste Section Chief, Lynne Welsh at 508 849-4007 within two hours of the finding; and
- c) undertake the actions specified under 310 CMR 19.150: Landfill Assessment Requirements and 310 CMR 19.151: Corrective Action Requirements as required by the Department."

2. Pursuant to 310 CMR 40.0321(1)(a), if at any time, monitoring detects the presence of any combustible gases at or in excess of 10% of the lower explosive limit at any location within a building or within any utility conduits on site or off-site, the owner/operator shall notify the local fire department and MassDEP's Bureau of Waste Site Cleanup-Emergency Response Section at 888-304-1133 within two (2) hours of the exceedance.

**V. RIGHT OF APPEAL**

1. **Review of Decision** - Pursuant to 310 CMR 19.037(4)(b), if the Applicant (Permittee) is aggrieved by MassDEP's decision to issue this Permit, it may within twenty-one (21) days of the date of issuance file a written request that the decision be deemed a provisional decision, and a written statement of the basis on which the Applicant believes it is aggrieved, together with any supporting materials. Upon timely filing of such a request, the decision shall be deemed a provisional decision with an effective date twenty-one (21) days after MassDEP's receipt of the request. Such a request shall reopen the administrative record, and MassDEP may rescind, supplement, modify, or reaffirm its decision. If MassDEP reaffirms its decision, the decision shall

become a final Permit on the effective date. **Failure by an applicant to exercise the right provided in 310 CMR 19.037(4)(b) shall constitute a waiver of the applicant's right to appeal.**

2. **Right to Appeal** - Any person aggrieved by the issuance or denial of this Permit, except as provided for under 310 CMR 19.037(4)(b), may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, § 150A and M.G.L. c. 30A not later than thirty (30) days following the receipt of the final Permit. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the permit by a court of competent jurisdiction, the Permit shall remain effective at the conclusion of the 30 day period.
3. **Notice of Action** - Any aggrieved person intending to appeal the issuance of this Permit to the Superior Court shall first provide notice of intention to commence such action. Said notice of intention shall include the file number [Transmittal No. X239659] and shall identify with particularity the issues and reason why it is believed the permit decision was not proper. Such notice shall be provided to the Office of General Counsel of MassDEP and the Regional Director for the regional office that processed the permit application at least five (5) days prior to the filing of an appeal.

Office of General Counsel  
Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

Martin Suuberg, Regional Director  
Massachusetts Department of Environmental Protection  
627 Main Street  
Worcester, MA 01608

No allegation shall be made in any judicial appeal of this permit decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in 310 CMR 19.000, provided that a matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the environmental impact of the permitted activity.

---

D. Lynne Welsh  
Acting Section Chief  
Solid Waste Management Program

