



Commonwealth of Massachusetts  
Executive Office of Energy & Environmental Affairs

## Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

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**October 21, 2011**

Joseph Becker, Facility Manager  
Covanta Haverhill Associates  
100 Recovery Way  
Haverhill, MA 01835

Re: HAVERHILL - Solid Wastes/COR  
100 Recovery Way  
Ward Hill Neck Landfill  
Closure Phases XI and XII, and  
Solar Electric Power Generation Station  
**Approval**  
File # X238218  
FMF # 132291

Dear Mr. Becker:

The Massachusetts Department of Environmental Protection, Northeast Regional Office, Bureau of Waste Prevention, Solid Waste Management Section (MassDEP) has reviewed Covanta Haverhill, Inc.'s (Covanta) application for capping and closing Phases XI and XII of the Ward Hill Neck Landfill at 100 Recovery Way, Haverhill, Massachusetts (the "landfill"). The application (BWPSW 25, Corrective Action Design, Transmittal Number X238218) was prepared and submitted on Covanta's behalf by Brown & Caldwell, Middleborough, Massachusetts. The application includes plans, consisting of fourteen (14) sheets including a cover sheet, titled:

Ward Hill Neck Sanitary Landfill  
Phases XI/XII Exposed Geomembrane  
Solar Final Cover  
Original Submittal: May 2011  
Revised: September 2011

Pursuant to the facility master plans, Covanta has filled the landfill in progressive phases, capping and closing each phase as filling of the phase(s) is completed (i.e. phased closure of the landfill). Covanta has completed placement of waste into Phases XI and XII of the landfill. The

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current application provides plans and specifications for placement of the cap on Phases XI and XII, and the post closure use of that portion of the landfill as a solar electric power generation station.

As proposed, all exposed surfaces of Phases XI and XII will be covered (i.e. “capped”) by flexible membrane liner cap (an “FML”) composed of a fabric reinforced thermoplastic polyolefin (TPO) flexible membrane. The TPO membrane will remain exposed, i.e. without covering by protective soil (vegetated loam and drainage sand).

The TPO membrane will be joined to the membranes of existing liner in Phases XI and XII (an HDPE<sup>1</sup> membrane) and the existing cap on the abutting Phase XIII (an LLDPE<sup>2</sup> membrane) by a simple lap joint in which the new TPO membrane is laid over the existing membrane. A layer of GCL<sup>3</sup> will be placed between the TPO membrane and the HDPE or LLDPE membrane to seal the junction against the lateral flow of water between the membranes. No weld, glue, clamp, or other binder, will be used to physically bind the TPO to the existing membranes.

The landfill surface within Phases XI and XII will be prepared for installation of the TPO membrane by placement of a layer of at least twelve (12) inches of select soil and/or processed glass aggregate (PGA) to provide a smooth subgrade as base for the membrane. The soil or PGA will be covered by a sixteen (16) ounce (minimum) non-woven geotextile pad for the TPO.

The existing landfill gas extraction system will not be expanded to include Phases XI and XII. Landfill gas generated by MSW<sup>4</sup> at the base of the filled waste is anticipated to vent via the existing leachate collection system. Due to the small amount of waste present, combined with the low permeability of the ash, the waste is not anticipated to generate sufficient landfill gas to warrant collection, or to adversely impact the TPO membrane.

The proposed cap includes installation of a 467 KWp DC<sup>5</sup> solar electric power generation station over the capped waste. The solar electric power generation station is anticipated to generate up to 474 MWh/yr<sup>6</sup> of electric power.

Arrays of photo voltaic cells (solar cells) will be placed on the westerly and southeasterly slopes of Phases XI and XII. The solar cells will be bonded directly to the TPO membrane, thus requiring no additional foundation for support. The solar cells are flexible and are delivered to the site permanently bonded to the TPO membrane by the membrane supplier. Enclosed traces

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<sup>1</sup> High Density Polyethylene.

<sup>2</sup> Linear Low Density Polyethylene.

<sup>3</sup> Geosynthetic Clay Liner.

<sup>4</sup> Municipal Solid Waste.

<sup>5</sup> Kilowatts peak DC.

<sup>6</sup> Million Watt-hours per year.

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will be bonded to the TPO membrane to route electrical wires from the solar cells to the edge of the landfill.

The application proposes the solar cell array on the southeasterly slope to serve as a “pilot study” to determine the feasibility of expanding the solar cell arrays to the southerly and easterly slopes. The application does not include a schedule for conducting the “pilot study”. The application does not include designs, details or specifications for installation of the additional solar cell arrays.

In addition, Covanta proposes in the application to inspect the TPO membrane and its appurtenances for integrity and damage a minimum of twice each year and to perform additional inspections following major and/or severe weather events. MassDEP deems that more frequent inspection of the facility is required for a minimum of the first year following completion of construction.

Therefore, this decision includes conditions that, in part, require Covanta:

- Submit a schedule for conducting the pilot study, and submitting a final report on the results of the “pilot study” that includes either the design plans for installation of the solar arrays and/or, in combination, the capping of the remaining TPO membrane with a final soil cap.
- Inspection of the TPO membrane and solar arrays once per month by an independent Massachusetts Registered Engineer the first year after completion of their installation and that thereafter, Covanta revert to the inspection frequency proposed in the application.

MassDEP has determined that the design for the capping of Phase XI and XII of the landfill, as proposed by the application, complies with the requirements of 310 CMR 19.000. Therefore, in accordance with M.G.L. Chapter 111, § 150A and 310 CMR 19.000, MassDEP approves your application subject to Covanta’s compliance with the conditions of this decision, as imposed pursuant to 310 CMR 19.043(1), and other conditions of 310 CMR 19.000 as applicable. This decision constitutes approval pursuant to 310 CMR 19.143 of the post-closure use of Phases XI and XII for the solar power arrays.

1. Covanta shall comply with the requirements of 310 CMR 19.000 and this decision including, but not limited to the requirements of 310 CMR 19.043(5) *Standard Conditions*.
2. Covanta shall, as required by 310 CMR 19.043(5)(a), comply with all applicable state and federal regulations. In addition, Covanta shall obtain; pursuant to applicable statute and regulation; all state, federal, and local permits required for the activities approved by this decision. Covanta is not relieved, by this decision, of its’ obligation to obtain such permits.

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3. The MassDEP reserves the right to amend, modify, suspend or revoke this approval, as necessary to protect the public health, safety or the environment, or as otherwise necessary to insure compliance with applicable law and/or regulation, including but not limited to, if MassDEP determines that the integrity of the final cover system has been compromised.
4. There shall be no deviation from this Approval and the approved design plans without prior notice to MassDEP. MassDEP may at its sole discretion require Covanta submit an application to MassDEP for review and approval for any modification/alteration to the design. In the event that MassDEP determines that a permit modification application is required Covanta shall submit such application to the MassDEP in accordance with the schedule specified by MassDEP. Covanta shall notify MassDEP of any significant changes in the project schedule.
5. Covanta shall notify MassDEP in writing (email followed by a hard copy) when construction of the closure of Phases XI and XII commences; such notice shall be submitted no later than two (2) business days after the commencement of construction. The notice shall include an updated schedule of the proposed major construction milestones. Thereafter, Covanta shall notify MassDEP of any significant changes in the construction schedule.
6. Quality Control/Quality Assurance (QC/QA) data for the project shall include documentation, by direct measurement, of the thickness of each soil layer, demonstrating that each layer has been placed in conformance with the approved design.
7. Within ninety (90) days of completion of the work, Covanta shall submit to MassDEP, an "as built" plan, ("Landfill Closure Completion" certification, BWPSW43) prepared by a Massachusetts Registered Professional Engineer. The "as built" plan shall include:
  - a. A report, prepared by the Massachusetts Registered Professional Engineer of record, providing all applicable QC/QA data and certifying that the closure was completed in conformance with the approved plans, including any modifications to those plans as may have been approved. Should substandard materials be received, the QC/QA report shall describe the disposition of the substandard materials.
  - b. Complete, detailed, project design plans, amended to incorporate all modifications and alterations, if any, made during construction.
  - c. An updated closure cost estimate for the landfill that includes for Phases XI and XII replacement of the solar cap with a cap meeting the requirements of 310 CMR 19.112 including, but not limited the requirements of:
    - i. 310 CMR 19.112(6) *Low Permeability Layer Standards*,

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- ii. 310 CMR 19.112(7) *Drainage Layers*, and
    - iii. 310 CMR 19.112(9) *Vegetative Support/Protection Layer*.
  - d. A revised operation and maintenance plan that consolidates inspection and maintenance activities at the landfill into a consolidated comprehensive plan that includes, but is not limited to, inspection checklist and reporting requirements for Phase XI and XII.
- 8. Upon approval of a final updated closure-cost estimate Covanta shall modify the Financial Assurance Mechanism (FAM) as necessary. Thereafter, Covanta shall maintain the FAM in accordance with the requirements of 310 CMR 19.051, including, but not limited to, the periodic revisions and adjustments of the FAM pursuant to 310 CMR 19.051(6).
- 9. Within thirty (30) days of the date of issuance of this decision, Covanta shall submit to MassDEP an application category BWP SW 45 *Modifications to a Solid Waste Facility*, that includes, but is not limited to, a schedule for:
  - a. completing the “pilot study” for expansion of the solar arrays to the easterly and southerly slopes of Phases XI and XII; and
  - b. submitting a report to MassDEP on the results of the “pilot study”.
- Pursuant to 310 CMR 19.062(6), the schedule shall provide that, the “pilot study”, be completed within not more than two (2) years of this decision.
- 10. Within ninety (90) days of MassDEP’s review and decision, pursuant to 310 CMR 19.000, on the “pilot study” report Covanta shall submit, for review and approval, an application for modification (BWPSW11, Landfills, Major Modification) of the closure of Phases XI and XII providing detailed plans, specifications, and a schedule to, either or in combination, expand the solar array or cover the membrane on the easterly slope of Phases XI and XII with a soil cover pursuant to the standards established at 310 CMR 19.112.
- 11. During the first year after completion of the Phase XI and XII cap and construction of the solar arrays the final cover system shall be inspected once a month by an independent Massachusetts Registered Engineer<sup>7</sup>. This shall include, but is not limited to, the integrity and condition of the cap and the solar arrays, and the storm water control system. Thereafter, Covanta shall conduct inspections of the cap and appurtenances thereto, as proposed in the application.
- 12. Covanta shall submit reports for each inspection (“inspection reports”) to MassDEP summarizing the results of the inspections and any actions taken or proposed to be taken, no later than fourteen (14) days following the date of the inspection. The

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<sup>7</sup> Or a qualified engineer employed by and supervised by an Independent Massachusetts Registered Engineer.

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reports shall be certified by Covanta and an Independent Massachusetts Registered Engineer pursuant to 310 CMR 19.011.

13. Covanta, its heirs, successors or assigns (collectively "Covanta"), shall ensure all activities for the operation and maintenance of the solar power arrays, and other activities as may affect the TPO membrane, are conducted in a manner that prevents, to the extent practicable, damage to the cap including, but not limited to the ripping, tearing, and puncturing of the TPO membrane. Until such time as the TPO membrane is covered by a soil or equivalent cover, Covanta shall inspect, maintain, and repair as necessary, the TPO membrane including, if necessary, replacement of damaged and/or deteriorated membrane. In the event of damage to the cap, Covanta shall report such damage to MassDEP in accordance with 310 CMR 19.000, but in no case later than within two (2) business days of Covanta's knowledge of the event. Notification pursuant to 310 CMR 19.000 shall not substitute for, nor otherwise relieve Covanta of any need to, make any notification, when applicable, pursuant to 310 CMR 40.0000.
14. Prior, but not greater than 270 days, to decommissioning of the solar electric power generation station, Covanta shall submit to MassDEP for review and approval the design plans, construction specifications, and QA/QC procedures for installation of a final cap that complies with the requirements of 310 CMR 19.112, and as described in condition 5.c. of this decision.
15. Covanta shall, following completion of construction of this cap on Phases XI and XII, maintain financial assurance sufficient to, upon decommissioning of the solar electric power generation station, cover the TPO membrane with soils and vegetative cover, and other appurtenant actions, to comply with 310 CMR 19.112, including modification, repair or replacement of the TPO membrane, as may be necessary.
16. Upon the final closure of the landfill Covanta shall, as part of the Comprehensive Assessment of the site (a "CSA") pursuant to 310 CMR 19.140(3), et al, include an evaluation of the closure of Phases XI and XII and propose improvements or modifications, if any, to Phases XI and XII that are necessary to comply with 310 CMR 19.000 or otherwise necessary to protect the public health, safety or the environment.

#### NOTICE OF RIGHT TO APPEAL

Covanta Haverhill Associates, Inc. (Covanta) is hereby notified that it may within twenty-one (21) days file a request that this decision be deemed a provisional decision under 310 CMR 19.037(4)(b), by submitting a written statement of the basis on which Covanta 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

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MassDEP's receipt of the request. Such a request shall reopen the administrative record, and MassDEP may rescind, supplement, modify, or reaffirm its decision. Failure by Covanta to exercise the right provided in this section shall constitute a waiver of Covanta's right to appeal.

Appeal. Any person aggrieved by the issuance of this decision, 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, s. 150A, and M.G.L. c. 30A, not later than thirty (30) days following the receipt of the final decision. The standing of a person to file an appeal and the procedures for filing such appeal shall be governed by the provisions of M.G.L. c. 30A. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the decision by a court of competent jurisdiction, the decision shall remain effective.

Notice of Action. Any aggrieved person intending to appeal this decision to the Superior Court shall first provide notice to MassDEP of their intention to commence such action. Said notice of intention shall include the MassDEP file number and shall identify with particularity the issues and reasons why it is believed the 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 which processed the application. The appropriate addresses to which to send such notices are:

General Counsel  
Department of Environmental Protection  
One Winter Street - 3rd Floor  
Boston, MA 02108

Regional Director  
Department of Environmental Protection  
Northeast Region  
205B Lowell Street  
Wilmington, MA 01887

No allegation shall be made in any judicial appeal of this decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in those regulations, 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.

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If you have any questions please contact David Adams at 978-694-3295.

Sincerely,

Sincerely,

*This final document copy is being provided to you electronically by the  
Department of Environmental Protection. A signed copy of this document  
is on file at the DEP office listed on the letterhead.*

**DCA**

David C. Adams  
Environmental Engineer  
Solid Waste Management

**JAC**

John A. Carrigan  
Section Chief  
Solid Waste Management

JAC/DCA/dca

enclosure: Fact Sheet

cc:

Haverhill Board of Health  
City Hall  
4 Summer St.  
Haverhill, MA 01830

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Brown and Caldwell  
151 Campanelli Drive, Suite B  
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