



Commonwealth of Massachusetts  
Executive Office of Energy & Environmental Affairs

## Department of Environmental Protection

Western Regional Office • 436 Dwight Street, Springfield MA 01103 • 413-784-1100

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Department of Public Works  
Town of Greenfield  
Town Hall, 14 Court Square  
Greenfield, MA 01301  
Attention: Sandra Shields, Director

June 22, 2011

RE: Greenfield-DSWM-11-114-001  
Wisdom Way Landfill  
Post Closure Use – Solar Power  
**Permit Modification - Approval**  
BWPSW22  
Transmittal #X236791

Dear Ms. Shields:

The Massachusetts Department of Environmental Protection (the MassDEP) is issuing this permit approval to the Town of Greenfield (the Town) for modification of the existing post closure use permit for use of the Town's capped landfill located off Wisdom Way (the landfill), as a solar power farm (solar farm). On September 1, 2010 the MassDEP issued to the Town the permit approval of the Town's Major Post Closure Use permit application, Transmittal #X234090. On March 7, 2011, the Town submitted a Minor Modification permit application (the application) under transmittal # X236791, to MassDEP, for minor modifications to the layout, footings, rack system and electrical systems for the photovoltaic panels of the solar farm. On May 31, 2011, the Town's consultant, TRC Corporation (TRC) submitted to MassDEP revised engineering calculations for loadings associated with the proposed modifications. The application was completed on behalf of the Town by TRC, and was signed by Daniel Butler, Massachusetts-registered Professional Engineer (P.E.) #47517; the application form was signed by Sandra Shields, Greenfield DPW Director. The application consists of the completed transmittal form, application form, text describing the proposed modifications, revised engineering calculations, and six revised engineering drawings.

### Summary of Proposed Permit Modifications

The proposed modifications to the original permit application are as follows:

- Due to a change in the photovoltaic (PV) module type, the number of proposed PV modules to be installed on the landfill will be reduced from 16,524 modules to 8,918 modules;
- Due to the change in PV modules, the number of proposed PV rack assemblies needed to hold the modules will be reduced from 612 to 343, and the number of concrete footings needed for the PV racks will be reduced from 1,226 to 1029;

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- Concrete footings for the PV racks will be the same size as previously proposed (3 feet wide by 8 feet long by 1.5 feet thick), but will be cast off-site rather than poured in place, and will be carried to the placement sites using a low-ground pressure tracked excavator;
- Due to the change in PV modules, the PV array will be modified, with additional PV rack assemblies placed in the southwest corner of the landfill, beyond the water bar (interior stormwater drainage swale) located there;
- An additional temporary construction road will be installed in the southwest corner, to install the additional PV rack assemblies. The construction of this additional temporary road will be identical to those previously proposed, i.e. 18 inches of gravel, 12 feet wide, over a woven geotextile, placed over the existing vegetative support layer of the cap;
- The inverters and transformers will be placed on a single gravel pad at the end of the permanent, paved road in Phases 1&2, rather than the two separate pads originally proposed;
- This gravel pad will contain two transformers, two switchboards, four inverters, and four DC disconnects;
- The originally proposed, Power Gate Plus PVS-500 inverters, which are larger enclosures which workers would have to enter, will be replaced with smaller, Solaron 500 inverters, which do not require worker entrance, and TRC therefore requests that the landfill gas monitoring/alarm requirements contained in the original Post-Closure Use permit will not be necessary;
- The concrete pads for the inverters, transformers, switchboards and disconnects will be poured in place, but will be at grade, not embedded 6 inches in the gravel pad as originally proposed;
- The original project schedule called for winter work; TRC states that the project will be completed by the Fall and therefore cold weather installation requirements will not be needed.

TRC performed revised geotechnical analyses for the loading (dead load, snow load, wind load, and design vertical load) of the PV rack foundations with the revised PV rack assemblies, and determined that the revised loads were all less than the original design loads. TRC also performed revised geotechnical analyses for the contact stress on the sand drainage layer from the loadings of the revised inverter and transformer equipment and foundations, and determined that the revised loads were all less than the original design contact stresses. TRC determined, therefore, that the conclusions of the original geotechnical analyses are unchanged, i.e. there will be no loads or stresses which would damage the impermeable layer of the landfill cap. TRC submitted diagrams of the Solaron inverter structures which show that the inverters are not structures which workers can enter in any fashion, so that landfill gas alarms will not be needed.

### **MassDEP Determinations**

Personnel of MassDEP have reviewed the Minor Modification permit application for the Wisdom Way Landfill in accordance with MGL c. 111 s. 150A, MGL c. 30A, 310 CMR 19.000, and MassDEP's publication Landfill Technical Guidance Manual (the LAC), revised in May, 1997. MassDEP has determined that the proposed modifications to MassDEP's September 1, 2010 Post-Closure Use permit for the Solar Farm at the Wisdom Way Landfill are approved, and the modified requirements of the Post-Closure Permit are outlined below (Conditions 2, 4 & 5 of the original permit have been modified).

1. As proposed, a third-party, qualified engineering consultant (the on-site engineer) shall be present on-site at all times when any construction work is taking place on the cap. The on-site engineer shall have sufficient staff on-site to provide quality assurance/quality control (QA/QC) oversight for all construction work at the site, and shall submit monthly construction progress reports to the MassDEP and the Town, which shall summarize the work performed during the month. At the end of construction work, the third-party engineering consultant shall submit a completion report, signed and

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sealed by a Massachusetts-registered P.E., certifying that the work was completed in accordance with the application and the conditions of this permit.

2. The Town and their contractor(s) are responsible to ensure that all necessary precautions are taken to protect the health and safety of workers and the general public during both construction and maintenance of the solar farm. A copy of an updated site-specific Health & Safety Plan for the construction and maintenance of the solar farm shall be submitted to the MassDEP prior to the beginning of any construction work, which shall include protocols for monitoring of landfill gas as needed, protocols for modifying work practices if landfill gas is detected at levels deemed unsuitable, and protocols for workers maintaining the inverters and transformers.
3. All disturbance of the landfill cap shall be limited to the proposed excavations and installations within and on top of the vegetative support layer of the cap, i.e. - no excavations or other penetrations shall be performed into the sand drainage layer of the cap without separate written approval from the MassDEP. All concrete footings on the cap shall extend only a maximum of 6 inches into the vegetative support layer of the cap, unless otherwise approved by the MassDEP. There shall be no penetrations (utility, conduit or other) at the base of any concrete footings or foundations. There shall be no penetrations of any kind of the impermeable layer of the cap.
4. The Town and their contractor(s) are responsible to ensure that the inverter and transformer boxes and the other electrical equipment (i.e. switchboards and disconnects) on the landfill cap area will not accumulate landfill gas during the construction and operation of the solar farm. Any landfill gas levels exceeding 10% of the Lower Explosive Limit (% LEL) within any electrical equipment box shall trigger the requirements of 310 CMR 19.132(4)(g), for notification and action. The additional requirements for the inverters and transformers include the following:
  - A. Each inverter and transformer shall be ventilated as proposed, and the floor of each inverter and transformer shall be solid, with no openings for landfill gas to enter at the floor level;
  - B. There shall be no utility, conduit or any other penetrations at the base of any electrical equipment box or their foundations; i.e. – all utility penetrations shall enter only through the side of the box, not the bottom, and these penetrations shall be fully sealed (both outside and within each conduit);
  - C. The electrical equipment boxes shall not include a heater; and
  - D. As part of the updated, site-specific H&S Plan, a written protocol shall be prepared and submitted for landfill gas monitoring during all maintenance of electrical equipment on the landfill cap. At a minimum, landfill gas monitoring shall be performed by workers **each time that electrical equipment boxes on the landfill cap are opened for any reason**, i.e. for meter readings, maintenance, etc.; and
  - E. All appropriate H&S precautions shall be taken if landfill gas is detected within electrical equipment boxes, and notifications shall be made to MassDEP as outlined above if needed.
5. Prior to the start of construction, an addendum shall be submitted to the MassDEP which shall contain the information required at Conditions 2 and 4 of this permit. If construction activities extend beyond December 1, an addendum shall be submitted to MassDEP containing cold- weather protocols for construction work, specifically for the installation of concrete footings and foundations.
6. All necessary precautions shall be taken to ensure that the proposed construction and maintenance work associated with the solar farm shall not in any way damage the impermeable layer of the landfill cap, the Phase III landfill liner, leachate collection/conveyance pipes, landfill stormwater control

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structures, landfill monitoring wells, or the landfill gas collection system. If any damage occurs to any of the above-listed landfill components, the Town shall notify MassDEP immediately (within 24 hours maximum), a written plan for repair of the components shall be submitted to MassDEP within 48 hours, and any repair work shall be completed on the schedule determined by MassDEP.

7. Prior to the commencement of construction activities, all landfill gas vents, landfill gas extraction wells, monitoring wells and other existing, above-ground structures of the landfill cap and appurtenances shall be flagged for visibility, and protective barriers shall be placed around such structures as needed to prevent damage by vehicles accessing the cap area.
8. Vehicles operating on the landfill cap shall only operate on the designated access roads, except for low-pressure construction equipment (with ground pressures of 7 PSI or less, including carried loads) which may operate off the access roads, in accordance with the remaining conditions of this permit. All operators of vehicles entering the cap area shall be clearly instructed by the on-site engineer and/or the contractor of the requirements of this permit prior to arrival, to avoid damage to the landfill cap components. Excavations into the vegetative support layer of the cap shall not be performed using a toothed excavation bucket, and the on-site engineer shall observe the full extent of each such excavation. If MassDEP determines that the use of excavation equipment is creating the potential for damage to the impermeable cap layer, the usage of such equipment shall cease immediately upon notification by MassDEP, and all remaining excavation work on the cap shall be performed by hand digging.
9. During the first year of operation of the solar farm, inspections of the landfill cap shall be performed on a monthly basis, and monthly inspection reports shall be submitted to MassDEP. Following the first year of operation of the solar farm, inspections of the landfill cap shall be performed on a quarterly basis, and quarterly inspection reports shall be submitted to MassDEP. Environmental monitoring shall continue to be performed at the landfill on an annual basis, and mowing of the landfill shall continue on a minimum of an annual basis. Any erosion problems, settlement problems, or other issues observed on the landfill cap shall be reported to MassDEP and repaired immediately.
10. This modified post-closure use permit shall be valid for a period of 30 years from the date of this permit, provided that MassDEP may amend the term of the permit in accordance with an approved modification pursuant to either 310 CMR 19.039 or 19.040. If the Town intends to operate the Solar Farm after the expiration of this permit, the Town is required to submit a request for a renewal of the permit at least 90 days prior to the expiration of the permit.
11. MassDEP and its agents and employees shall have the right to enter upon the landfill at all reasonable times, to inspect the landfill and any equipment, structure or land located thereon, take samples, recover materials or discharges, have access to and photocopy records, to perform tests and to otherwise monitor compliance with this Permit and all environmental laws and regulations. This right of entry and inspection shall be in addition to MassDEP's access authorities and rights under applicable federal and states laws and regulations, as well as any permits or other agreements between the Permittee and MassDEP.
12. MassDEP reserves the right to require additional or increased monitoring or maintenance activities in the event that the post-closure use is or may be having a detrimental effect on the landfill cap or appurtenances. MassDEP reserves all rights to suspend, modify or rescind this permit, should the conditions of this permit not be met, should the Solar Farm create nuisance

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conditions or threats to public health, safety or the environment, or should MassDEP otherwise determine that continued post-closure use is negatively impacting the landfill cap or appurtenances.

Pursuant to 310 CMR 19.037(5), any person aggrieved by the issuance or denial of this permit 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 c. 30A not later than thirty [30] days following the receipt of the final permit. 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. 30 A. 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 decision shall remain effective or become effective at the conclusion of the 30 day period.

Any aggrieved person intending to appeal the decision to the superior court shall provide notice to MassDEP of said intention to commence such action. Said Notice of Intention shall include the MassDEP File Number (10-114-001) and shall identify with particularity the issues and reason(s) why it is believed the approval 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 made the decision. The appropriate addresses to which to send such notices are:

General Counsel  
Department of Environmental Protection  
One Winter Street-Third floor  
Boston, 02108

Regional Director  
Department of Environmental Protection  
436 Dwight Street - Fifth Floor  
Springfield, MA 01103

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 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 public health or environmental impact of the permitted activity.

This approval pertains only to the Solid Waste Management aspects of the proposal and does not negate the responsibilities of the owners or operators to comply with any other local, state or federal laws and regulations now or in the future.

If you have any questions about this matter, please contact Larry Hanson of this office at 413-755-2287.

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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.

Daniel Hall  
Section Chief, Solid Waste Management

cc: Greenfield Board of Health  
Greenfield Planning Board  
Greenfield – Mayor’s Office  
Axio Power – Bill Jordan  
TRC – David Andrews, P.E.