



COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
WESTERN REGIONAL OFFICE

436 Dwight Street • Springfield, Massachusetts 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

September 1, 2010

RE: Greenfield-DSWM-10-114-001  
Wisdom Way Landfill  
Post Closure Use – Solar Power  
**Permit Approval**  
BWPSW36  
Transmittal #X234090

Dear Ms. Shields:

The Massachusetts Department of Environmental Protection (the MassDEP) is issuing this permit approval to the Town of Greenfield (the Town) for the post closure use of the Town's capped landfill located off Wisdom Way (the landfill), as a solar power farm (solar farm). On July 12, 2010 the MassDEP received from the Town the BWPSW36 Major Post Closure Use permit application, under transmittal #X234090 (the application). The application was completed on behalf of the Town by TRC Corporation (TRC), and was signed and stamped by Robert E. Jackson, Massachusetts-registered Professional Engineer (P.E.) #48086; 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 use, engineering calculations, and eight engineering drawings.

Summary of Proposal

The application proposes the construction and maintenance of a 2 megawatt (MW) photovoltaic solar farm on the 22.2 acres of the capped landfill, as follows:

- One permanent (paved) and two temporary access roads will be built on the landfill cap for vehicle access for construction and maintenance activities;
- A total of 1,226 concrete foundation footings will be poured in place within the vegetative support layer of the cap;
- 612 photovoltaic panel racks will be installed on the foundation footings;
- Two inverter/transformer enclosures will be installed on foundation footings;
- The photovoltaic panel racks will be connected to the inverters via above-ground and buried electrical cables; and

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- The inverters will be connected to a transformer off the landfill via a buried electrical cable, for transmission of electricity to the WMECO utility grid at the adjacent WMECO electrical substation.

A permanent access road will be constructed within the northern perimeter of the Phase I/II cap, just south of the landfill gas extraction wells. The road will be constructed by stripping off the organics of the vegetative support layer, placement of a woven geotextile, addition of 18 inches of compacted gravel, with 3 inches of asphalt pavement over the gravel. Two temporary access roads will be constructed from the permanent access road, one each into Phase I/II and Phase III. The temporary access roads will be constructed by placement of a woven geotextile over the vegetative support layer, and addition of 18 inches of compacted gravel. The temporary access roads will be removed by the end of construction activities.

The concrete foundation (footings) for the photovoltaic racks will be constructed by excavating 6 inches into the vegetative support layer, and pouring concrete in place in forms 3 feet wide by 8 feet long by 1.5 feet thick. The photovoltaic racks will be bolted to the footings, and the electrical transmission wiring from the racks will be buried at the base of the vegetative support layer, in Schedule 80 PVC conduit, covered by either 12 inches of compacted soil or poured concrete. All photovoltaic rack assemblies and above-ground wiring will be kept at least 10 feet from any landfill gas vents.

Two concrete foundation (footings) for inverter/transformer enclosures will be constructed by excavating 6 inches into the vegetative support layer of the cap, and pouring concrete in place in forms approximately 10 feet wide by 30 feet long by 1.5 feet thick. Two pre-constructed inverter/transformer enclosure modules will be placed on the footings, and connected by buried electrical cable to a transformer located off the cap. The inverter enclosures will be kept at least 20 feet from any landfill gas vents.

TRC performed geotechnical analyses for the loading on the foundations, settling and stability of the foundations, and for loading on the access roads on the cap; TRC concluded that all analyses showed minimal loading and no stresses which would damage the impermeable layer of the landfill cap. TRC performed stormwater analyses for changes to stormwater runoff from the proposed work; TRC concluded that there will only be small changes in stormwater runoff, and the existing stormwater control system can handle the flows. TRC states that the proposed construction and operation of the solar farm will not alter the conclusions of the Qualitative Risk Assessment for the landfill (completed as part of the Comprehensive Site Assessment); i.e. that there are no significant risks to human health and the environment posed by the landfill, or by the presence of the solar farm on the landfill.

There are no proposed changes to the existing, long-term monitoring program for the landfill. The landfill will continue to be mowed annually, at a minimum. During the first year of operation, the grass cover of the landfill cap at the solar farm will be inspected monthly. If erosion is observed (especially along the drip-edges of the photovoltaic panels), the surface will be stabilized with wood chips, mulch, matting, or other erosion control materials. If issues are identified with problematic vegetation growth, a landscape consultant will be hired to investigate and address the issues.

The landfill will be surrounded by chain-link fence and the solar farm will be continually monitored by video cameras for security surveillance. The application states that Axio Power will contract with local firms for maintenance and security of the solar farm. Decommissioning of the solar farm if required in the future, would consist of removal of all structures, including foundations, and restoration of the landfill cap to its original condition.

TRC states that construction of the solar farm will begin in November of 2010, and will be completed by February of 2011.

### **MassDEP Determinations**

Personnel of MassDEP have reviewed the Post-Closure Use 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 application is approved in accordance with MGL c. 111, s. 150A and MGL c. 30A, subject to the conditions outlined below.

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 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 the 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, protocols for workers entering the inverter enclosures, and protocols for responding to any landfill gas alarm conditions within the inverter enclosures.
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 enclosures on the landfill cap area will not accumulate landfill gas within the enclosures during the construction and operation of the solar farm. Any landfill gas levels exceeding 10% of the Lower Explosive Limit (% LEL) within an inverter/transformer enclosure shall trigger the requirements of 310 CMR 19.132(4)(g), for notification and action. The additional requirements for the enclosures include the following:
  - A. The maximum areal size of each of the two enclosures shall not exceed 30 feet long by 10 feet wide;
  - B. Each enclosure shall have a hard-wired, landfill gas monitor within the enclosure, fully operational at all times (with battery backup), which shall: (1) be calibrated to a methane standard; (2) shall have an audible alarm; (3) shall have a lighted, rotating beacon above the entrance door to the enclosure (for alarm mode); and (4) shall be tied into the SCADA web-based monitoring system for the solar farm;
  - C. Each enclosure shall be ventilated as proposed, and the floor of each enclosure shall be solid, with no openings for landfill gas to enter at the floor level;
  - D. There shall be no utility, conduit or any other penetrations at the base of the enclosures or

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- their foundations; i.e. – all utility penetrations shall enter only through the side of the enclosure, not the bottom, and these penetrations shall be fully sealed (both outside and within each conduit);
- E. The enclosures shall not include a heater; and
- F. As part of the site-specific H&S Plan, a written protocol shall be prepared and submitted for all entrance by workers into the enclosures, and for regular calibration and maintenance of the landfill gas monitors.
5. Prior to the start of construction, an addendum shall be submitted to the MassDEP which shall contain:
- A. The information required at Conditions 2 and 4 of this permit; and
- B. 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 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) 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 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

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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. MasDEP 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 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.

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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.

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  
Mayor William Martin  
Axio Power – Bill Jordan  
TRC – David Andrews, P.E.