Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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December 27, 2011

Thomas K Lynch, Interim Town Manager
Town of Barnstable
382 Falmouth Road
Hyannis, Massachusetts 02601

and

Eric T. McLean, P.E.
American Capital Energy
15 Tyngsboro Road, Suite 4A
North Chelmsford, Massachusetts 01863

RE: Approval with Conditions
Application for: BWP SW 36 Post-Closure Use - Major
Solar Photovoltaic Array
Transmittal #: X238588

At: Barnstable Municipal Landfill
Flint Street
Barnstable, Massachusetts
Facility ID#: 39053, Regulated Object#: 172309

Dear Mr. Lynch and Mr. McLean:

The Massachusetts Department of Environmental Protection, Solid Waste Management Section (MassDEP), has completed its Administrative and Technical review of the referenced Post-Closure Use permit application (Application) for the Barnstable landfill (Landfill). The Application was prepared and submitted on behalf of the Town of Barnstable and American Capital Energy (Applicants) by Weston & Sampson Engineers, Incorporated (Weston or Engineer) of Peabody, Massachusetts.

MassDEP has determined the Application is administratively and technically complete and hereby **Approves** the Post-Closure Use of the Landfill for a 4 megawatt (MW) solar photovoltaic (PV) array subject to conditions as specified herein.

I. SUBMITTALS:

MassDEP has reviewed the Application pursuant to 310 CMR 19.000: *Solid Waste Regulations*, 310 CMR 19.143: *Post-Closure Use of Landfills* and MassDEP's *Landfill Technical Guidance Manual, May 1997* (Manual). The Application consists of the following:

A. The permit transmittal, application forms for Post-Closure Use - Major (BWP SW 36), narrative describing the proposed use, engineering calculations, six engineering drawings and documents received by MassDEP on December 16, 2011.

B. A letter report dated December 16, 2011, prepared by Weston & Sampson and received by MassDEP on December 16, 2011.

C. Supplemental Application information, prepared by Weston & Sampson, consisting of a report dated December 21, 2011, engineering drawings and documents received by MassDEP on December 22, 2011.

The Application is signed and stamped by Duane C. Himes, Massachusetts Professional Engineer No. 32336.

II. SITE DESCRIPTION & INVESTIGATIONS:

The Barnstable landfill is located on an 86-acre site assigned parcel of town owned land located off Flint Street in Barnstable (Site). The closed unlined Landfill occupies approximately 52-acres of land on the northern and western portion of the Site. A portion of the final cover system (Type "B" Area) is used for composting of waste water treatment plant sludge and yard waste. The Town of Barnstable's transfer station is located immediately to the east of the Landfill. The Town of Barnstable's Department of Public Works facility is located immediately to the southeast of the Landfill. Existing on-site structures include the maintenance building, maintenance garage, operations trailer, scale house, transfer station mechanical room, swap shop and storage trailer. The area separating these structures from the edge of the Landfill is paved. The closest structure to the Landfill is the maintenance building and garage which is equipped with a methane detection system.

The 86-acre parcel is bounded by: Old Barnstable-Falmouth Road on the north; commercial buildings to the northeast; Flint Street to the east; undeveloped land (former burrow pit) owned by the Town to the southeast; utility easement to the south and residential properties to the west. The closest residential dwelling is located approximately 150 feet southwest of the Landfill. The Landfill began operations approximately 60 years ago and was owned and operated by the Town. The Town ceased accepting waste in October 1996.

Existing Final Cover System Design: On May 30, 1996, MassDEP approved the Corrective Action Design (CAD) for the Landfill. The final cover system construction was completed during the 1996 and 1997 construction seasons in three distinct phases: the northern 27.4 acre (Type A-1 final cover system), the southern 17.5 acre (Type A-2 final cover system), and the eastern 6.7 acre (Type B final cover system) Landfill areas. The final cover system was installed with a minimum top slope of 5% and side-slopes no greater than 3:1.

Type A-1 Final Cover System[1]: The northerly final cover design was constructed of the following components from bottom to top:

- a 6-inch sand gas venting layer
- a textured 40-mil Linear Low Density Polyethylene (LLDPE) flexible membrane liner (FML) barrier layer
- geocomposite drainage layer
- a 12 inch sub soil layer
- 6 to 10 inch topsoil layer

Type A-2 Final Cover System[1]: The southerly final cover design was constructed of the following components from bottom to top:

- a 6-inch sand gas venting layer
- a textured 40-mil LLDPE FML barrier layer
- 6 to 12 inch granular soil drainage layer
- 6 to 10 inch topsoil layer

Type B Final Cover System[1]: The easterly final cover design was constructed of the following components from bottom to top:

- 6 inch sand gas venting layer
- a textured 40 mil LLDPE FML barrier layer
- 9 inch granular soil drainage layer
- geotextile separation layer
- 9 inch crushed stone layer
- optional pavement (An asphalt pad was constructed for the leaf composting and drop-off area)

In December 1997, MassDEP received a Construction Certification report prepared by Stearns & Wheler, LLC. On April 18, 1998 MassDEP issued an approval with conditions for the construction certification report.

The closure design incorporates a passive gas venting system consisting of 51 gas vents. The gas vents were installed in 36 inch bore holes to a depth of 5 feet beneath the gas venting layer. The gas vents are connected to lateral gas collection pipes installed within the gas venting layer.

Note 1: For a complete description of the Barnstable final cover system refer to the document entitled: *Landfill Closure Construction Documentation Report (December 1997)* prepared by Stearns and Wheler, LLC.

Post closure Environmental Monitoring: A Comprehensive Site Assessment (CSA) was submitted to MassDEP on June 9, 1995. MassDEP approved the CSA on January 11, 1996.

Post-closure environmental monitoring (groundwater and soil-gas monitoring) is currently conducted by the Town in accordance with a post-closure environmental monitoring plan approved by MassDEP on June 13, 2010. The Town has not proposed any changes to the post-closure environmental monitoring plan based on the proposed post-closure use.

On October 10, 2000, MassDEP approved a modification to the transfer station provided that the Town evaluated ambient air quality in the transfer station area to ensure that the existing passive

landfill gas venting system was not presenting a health risk to Town workers or residents accessing the adjacent transfer station. The Town collected four ambient air samples in SUMMA canisters and analyzed the air samples for volatile organic compounds using EPA method TO-14 in August and November 2000, and in January and May 2001. The Town's consultant, Stearns and Wheler, provided the data in a May 22, 2001 letter to MassDEP, and concluded that the detected compounds did not pose a significant risk to workers and residents at the transfer station.

On September 30, 1996, MassDEP approved the reuse of processed soils from the excavation of Cape Resources Company construction and demolition (C&D) waste landfill located in Barnstable Massachusetts as a component of the final cover system construction at the Barnstable Municipal Landfill (**refer to attached document**). MassDEP approved the reuse of the processed soils for the lower 12 inches of the 18 inch vegetative support layer for the 27 acre Type A-1 final cover system and for the bottom 6 inches of the 12 inch vegetative support layer for the Type A-2 final cover system in 1997. The Applicants shall not remove the processed soils from the Landfill and if the Applicants excavate the processed soil they shall comply with condition #17 herein.

POST-CLOSURE USE PROPOSAL SUMMARY:

American Capital Energy (ACE or Developer), through an agreement with the Town and Cape and Vineyard Electrical Cooperative, Incorporated (CVEC), proposes to develop 4 MW solar photovoltaic installation on the Landfill. Hereinafter, the Town of Barnstable, American Capital Energy and all construction and maintenance personnel associated with the Town's Landfill shall be referred to as the "Applicants' Contractors". ACE in conjunction with the Town is proposing to construct and maintain a PV array on the Type A-1 final cover system (proposed "North Array") and Type A-2 final cover system (proposed "South Array") final cover systems of the Landfill. Additionally, the Applicants are also proposing to construct the proposed "East Array" on an adjacent Town owned parcel of land (former burrow pit) that is not site assigned in accordance with 310 CMR 16.00 *Site Assignment Regulations for Solid Waste Facilities*. The proposed PV array on the Type A-1 and Type A-2 final cover systems consists of the following components:

- Construction of permanent and temporary on Landfill access roads, as needed;
- Approximately 2,180 precast concrete foundations/ballasts (70 inches x 40 inches by 14 inches thick) will be placed within the topsoil of the final cover system;
- Approximately 15,262 PV modules (Yingli Solar Modules) will be placed on approximately 800 PV panel support racks (SunLink Groundmount System) placed on the concrete foundations;
- Three electrical equipment concrete pads: two concrete pads on Landfill final cover system and one concrete pad off the Landfill final cover system on the non-site assigned parcel. The three electrical equipment concrete pads will support the electrical equipment, including inverters, transformers, switchboards and switchgear;
- The PV panel support racks will be interconnected using above grade cables mounted on the panel racks, and mounted on aboveground conduit (block assemblies) supports except at temporary access road crossings.

- The inverter/transformer located on the North Array electrical equipment concrete pad is connected to the switching gear and recording meter concrete pad using both above grade and below grade cables;
- The inverter/transformer located on the South Array electrical equipment concrete pad is connected to the East array electrical equipment (inverter/transformer) concrete pad using both above grade and below grade cables;
- Two switching gear and recording meter concrete pads are proposed: one off of the final cover system east of the Landfill adjacent to the transfer station and DPW facilities, and another south of the Landfill on the non-site assigned parcel;
- The output from the PV array is proposed to be transmitted to the NSTAR primary system via two interconnections. The output from the North array will be transported from the North array switching gear and recording meter pad to three new utility poles, to the existing overhead NSTAR primary system off of Osterville West Barnstable Road. The output from the South array and East array will be transported to the East array switching gear and recording meter concrete pad located south of the Landfill (off the final cover system) and transmitted via buried electrical cables to the existing overhead NSTAR located in a utility right-of-way south of the Landfill.

There are existing access roads located on the final cover system consisting of the following components from top to bottom:

- 8 inches of dense graded crushed stone
- a woven filter fabric
- a 12 inch sand drainage layer
- textured 40 mil LLDPE

The existing access road will be upgraded with an additional 16 inches of dense graded crushed stone or gravel, as needed, in accordance with the GSE Lining Technology LLC design manual for soil thicknesses over liners to maintain the required protection of the FML. If the existing permanent access road is to be used for heavy equipment traffic, additional material will be added to provide a 36 inch separation between the FML and the access road. The thickness of the existing roads will be verified in the field prior to use by heavy equipment.

Temporary access roads will be constructed, if needed, during construction to minimize impact to the landfill final cover system. The temporary access roads will be constructed by placement of a woven filter fabric over the vegetative support layer, and the addition of 18 inches of compacted dense graded crushed stone. The temporary access roads will be removed within six months of completion of construction and the road areas will be restored to meet the specification of the cover system.

Most of the array will be on areas of the Landfill cap with a slope of less than 5% (2.9 degrees) but the edges may expand into areas where there is up to a 15% (8.5 degrees**)** slope.

The solar array will utilize PV modules (3.25-foot by 5.42-foot) mounted on galvanized steel, aluminum, or stainless steel framed racks attached to the precast concrete ballasts. The racking system will hold the panels at a fixed tilt of 20 degrees from horizontal. The PV array will use

monocrystalline PV modules mounted on racks consisting of nine modules in a single row (panel layout 1 x 9) with two ballasts per rack. Each panel support rack or assembly will utilize a fully ballasted mounting system with no penetrations of the low permeability layer of the final cover system. The modules and the associated racking will be approximately 3 feet high in the front and 5 feet high in the rear. The rows of solar panels will be oriented east-west and the distance between rows will vary from approximately 4'6" to 8'7" (north-south measurement). Because the Landfill contours are not aligned with the east-west axis of the racks, the rows will be at a slight cross-slope angle.

The existing elevation and grade of the Landfill will be minimally altered. The proposed design will impact limited portions of the topsoil layer of the final cover system. The impacts result from: installation of rack ballasts, installation of inverter/transformer concrete pads and a switchgear pad, and above ground electrical wiring conduit supports.

The panels will be supported by PV racks on concrete ballasts. To install the precast concrete ballast on the slope, the vegetation and topsoil below each of the array ballast will be removed. The excavations will not extend to a depth below the topsoil layer which is approximately 6-10 inches for Type A-1 and Type A-2 final cover system. After excavating, a layer of geotextile will be placed on a prepared base, and then a layer of gravel will be placed and compacted in preparation for placement of the concrete ballast. The gravel will be installed such the maximum slope on the concrete ballast will be 5% or less.

The support racks will house all wiring between the modules. The electrical transmission wiring will run within cable conduits above grade, mounted on the rack assemblies where applicable, or mounted on conduit supports (block assemblies) above grade to keep the cables off the ground surface. At temporary access road crossings the electrical wiring will run below ground. The electrical wiring that will be placed below these temporary roads will be placed in 4 inch fiberglass reinforced epoxy (FRE) cable conduits, at a minimum depth of 1 foot below the road surface.

The North array electrical equipment concrete pad is connected to the switching gear and recording meter concrete pad, located on the site assigned parcel, using both above grade and below grade cables. The below grade cables are to be placed into a concrete encased conduit duct bank located on the Landfill final cover system (**refer to condition #18**). The South array electrical equipment pad is connected to a second switching gear and recording meter concrete pad, located for off of the final cover system, using both above ground and below grade cables. The below ground cables are located off of the landfill final cover system on the non-site assigned parcel. All underground cables will be sealed, have gas tight fittings, and will include flexible connections at transition points. There are no subsurface penetrations at the inverters, transformer and switchgear concrete pads. Conduits will not enter the concrete pads from beneath the pads but will surface and run into the side of the inverter/transformers and other equipment with the use of flexible gas tight connections. All electrical work will be designed for the most recent version of the Massachusetts Electric Code (MEC) which includes and incorporates the requirements of the National Electric Code (NEC). Prior to construction, an electrical permit will be obtained from the local building department official, and the project will incorporate any additional electrical requirements stipulated by the building department official.

The ballasts will be precast concrete slabs and will be brought into the site via pickup trucks or lightweight all-terrain forklifts. Three concrete electrical equipment pads for the transformers/inverters will either be precast offsite or formed on site. The area beneath the concrete electrical pad will be prepared by excavating the 6-10 inch topsoil layer and backfilling with 6-10 inches of compacted crushed gravel (**refer to condition #11**).

Two concrete pad mounted disconnect switch and recording meters will be installed off the final cover system. The area beneath the concrete pad will be prepared in a similar fashion to the inverter/transformer pad by excavating the topsoil and backfilling with compacted crushed gravel in the area were concrete is to be placed. Final concrete pad design (dimensions) for both the inverter/transformer and the switchgear will be determined based on the final equipment selection and approval by electrical inspector and/or utility representative (**refer to condition #13**).

Geotechnical Evaluation: The Application included a geotechnical evaluation for the installation of the PV array and supporting structures on the final cover system.

The Application included an analysis of the foundations for the PV array that will bear directly on the final cover system and has considered the dead load, snow load and wind loading. The results of the geotechnical evaluation are as follows;

- The PV modules, panel support racks, and ballasts do not exceed loading criteria for the Landfill cover system.
- The electrical equipment concrete pads (inverter/transformer pad) do not exceed the recommended loading criteria for the Landfill cover system.
- The PV array will not cause adverse Landfill settlement.
- The Engineer determined the potential vehicle loading on the existing and temporary access roads would not produce unacceptable loading stresses to the Landfill cover system.
- The PV array is stable on a 15% slope.
- The 4 inch FRE electrical cables conduit buried under the temporary access road and the road base soil surrounding the conduit will support the applied vehicle loads.

The anticipated maximum loading scenario racking system (ballasts, racking system, and modules) and the electrical equipment concrete pad on the Landfill surface will result in a bearing pressure ranges between 225 and 389 pounds per square foot. The bearing pressure ranges are all less than allowable 1,000 pounds per square foot (less than 7 psi).

The estimated settlement resulting from the static loads increase of the PV array concrete foundation/ballasts was 0.033 inches for the Type A-1 final cover system and 0.038 inches for the Type A-2 final cover system. The Engineer has stated the FML of the final cover system can undergo this distortion without impacting the integrity of the liner.

A sliding stability evaluation was performed for the concrete ballasts (foundations). A maximum slope of 15% was evaluated. The Engineer determined the factor of safety for sliding of the PV ballasts on the underlying soils was approximately 1.5 on a 15% slope.

Storm Water: The Applicants' Engineer performed storm water calculations using Hydro CAD modeling software (TR-20) analysis for the 24-hour, 25 year storm and under the 24-hour, 100 year storm. The PV array will modify run-off characteristics by the addition of impervious surfaces (i.e. ballasts and concrete pads) which represent less than 5% of the closed Landfill surface. The capacity of various elements of the Landfill storm water conveyance system were reviewed including, swales, stoned line ditches, storm water piping and detention basins. The Applicants' Engineer concluded there will be adequate capacity to properly manage the post-closure development at the Landfill and that there is no need to modify the existing storm water management system.

Post Closure and Post-Closure Use Operations and Maintenance: The Town currently implements the Landfill's post closure monitoring and maintenance plan. Post closure environmental monitoring (groundwater, surface water, and soil gas monitoring) is currently conducted by the Town in accordance with the permit application approved by MassDEP on May 12, 2011 (transmittal # X235607). Operations and maintenance for the Landfill in the area where the PV array is located up to a distance of 10 feet away from the edge of the PV array will be performed by the project Developer: American Capital Energy. The Town will maintain the remainder of the Landfill outside the 10 foot buffer around the PV array (**refer to condition #1**).

There are no proposed changes to the post closure operation and maintenance plan for the area to be maintained by the Town and not used for the PV array. Currently, the Landfill is mowed at least annually with semi-annual cover system inspections by the Town.

A post-closure use operation and maintenance plan for the post-closure use area used for the PV array was submitted with the Application. The Developer proposes to provide: site security; electrical maintenance; module cleaning; and final cover system maintenance including but not limited to, mowing, undergrowth control, pest control, and erosion control. The Developer proposes to conduct monthly inspections to check the cap for erosion and changes in vegetative growth following the first year of construction of the PV array (**refer to condition # 15**).

The Application included a Health and Safety Plan for operation and maintenance activities to be performed by employees at the Barnstable landfill solar project for the operation and maintenance of the proposed PV array. The Application did not include a health and safety plan for the construction of the proposed PV array (**refer to condition #7**).

Site Security: There are two entrances to the Landfill and both are gated. The Landfill is fenced. The Applicants have proposed to install approximately 750 feet of 8 foot high chain-link fence between the residential properties and the non-site assigned parcel where the off-site PV array will be installed. If unauthorized access proves to be a problem, additional security measures will be considered including additional fencing and closed-circuit TV cameras for monitoring the Site.

Decommissioning Plan: Decommissioning and site restoration will include dismantling and removal of all panels and supporting equipment, transformers, overhead cables and foundations

and restoration of the roads, and modules sites to the same physical condition that existed immediately before construction of the PV array.

IV. PERMIT DECISION:

MassDEP, having determined the information in the Application is satisfactory and in accordance with its authority granted pursuant to M.G.L. c.111, s. 150A, and 310 CMR 19.000, hereby **APPROVES** the Post-Closure Use of the Barnstable Landfill for a Solar Photovoltaic Array subject to the conditions identified herein.

V. GENERAL PERMIT CONDITIONS:

1. Permit Limitations: The issuance of this approval is limited to the proposed Solar Photovoltaic Array at the Barnstable landfill as detailed in the Application and does not relieve the Applicants from their responsibility to comply with all other regulatory or permitting requirements. Post-Closure Use construction shall proceed in complete compliance with the approved plans, MassDEP's regulations and requirements, the Manual or as required by this Approval. This approval does not relieve the Town, as the owner of the Landfill, from its responsibility to comply with all post closure monitoring and maintenance requirements for the entire Landfill. There shall be no deviation from this Approval without prior consent from MassDEP.

2. Regulatory Compliance: The Applicants, Engineers and Applicants' Contractors shall fully comply with all applicable local, state and federal laws, regulations and policies, by-laws, ordinances and agreements. This includes but is not limited to, 310 CMR 19.142: *Post-Closure Requirements*, 310 CMR 19.143: *Post-Closure Use of Landfills*, and 310 CMR 19.043: *Standard Conditions*. Applicable federal regulations include, but are not limited to, 29 CFR Part 1910, OSHA standards governing employee health and safety in the workplace and all applicable local, state and federal electrical codes and permits, including National Electrical Code (NEC), 2011 Edition, Article 690-"Solar Photovoltaic (PV) Systems".

3. Inspection and Repair of Settlement Areas: Prior to construction of the PV array, any suspect settlement areas on the Landfill project area shall be surveyed to determine the lowest spot. The surrounding area should be then surveyed to find the "relief point" defined as the lowest surrounding area where ponded water would flow off the cap. The elevation difference is defined as the "pond value". Minor settlement shall be defined as less than a 12 inch pond value. 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 should be surveyed and the location marked on a plan with the pond value. Any future settlement should be recorded cumulatively. If/when the total settlement reaches 12-inches, the area will be considered to have suffered major settlement and appropriate repairs to eliminate ponding shall be performed.

   Major settlement is defined as a pond value of 12 inches or more. When this occurs, the final cover system must be repaired to prevent water from ponding above the low permeability layer. The Applicants may either:

1. Strip off the final cover soils above the low permeability layer, inspect and repair the low permeability layer if/as necessary, place low permeability soil as necessary to promote runoff, replace final cover soils; or

2. Expose the low permeability soil or geomembrane in a trench around the perimeter of the settled area. Fill the area with soil to form slopes promoting runoff. Cap the area with a new low permeability membrane, GCL, or low permeability soil layer that ties into the existing low permeability layer at the identified perimeter. Place new drainage sand and vegetative support material over the new cap area.

Any proposal to repair minor settlement may be done as routine maintenance, provided that the Applicants reports the settlement to MassDEP and states their intent to perform repairs and provides MassDEP with final survey results and a summary write up.

Any proposal to do 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.

4. Notification of Construction: The Applicants shall notify MassDEP in writing (e-mail is acceptable) when the post-closure use construction commences and is completed.

5. Oversight and 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 at the Landfill. Within seven (7) months of completing the installation of solar photovoltaic array, MassDEP shall be provided with a certification report. The report shall be signed and stamped by a Massachusetts-registered professional engineer and include, at a minimum, written certification from the supervising engineer that the project was performed in accordance with MassDEP regulations, requirements and the approved Post-Closure Use permit application. At a minimum, the report shall include as-built drawings depicting all pertinent site features, equipment used etc.

6. Preconstruction Work: Prior to commencement of construction activities all landfill gas passive vents, soil-gas monitoring wells, groundwater monitoring wells and other existing above ground structures on 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 area.

7. Health and Safety: The Applicants, Engineers and Applicants' Contractors are responsible to ensure all necessary precautions are taken to protect the health and safety of workers and the general public during both the construction phase and during the operation and maintenance phase of the post-closure use.

   A copy of the site specific health and safety plan for the post-closure use CONSTRUCTION phase, shall be submitted to MassDEP (for its files) prior to the beginning of any construction work. The health and safety plan shall include as a minimum;

- 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 levels deemed unsuitable, and
- protocols for handling the processed soils reused as part of the final cover system (**refer to attachment and condition #17**)

8. Vehicles Operating on the Landfill Final Cover System: Vehicles operating on the Landfill final cover system shall only operate on the designated permanent and temporary access roads, except for low-pressure construction equipment (with ground pressures of **7 psi** or less) in accordance with the remaining conditions of this permit. Low-pressure construction equipment operating off the access road shall limit turning on the vegetative support layer as much as possible. If MassDEP determines the use of excavation equipment is creating the potential for damage to the FML, the usage of such equipment shall immediately cease upon notification by MassDEP. All operators of the vehicles entering the final cover system 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 final cover system components. A list of low ground pressure equipment used and the pressure rating of each vehicle shall be indicated in the certification report required in condition #5.

9. Permanent and Temporary Roads and Low Ground Pressure Equipment: Low ground pressure equipment shall not access the final cover system from permanent and temporary roads where the transition will result in excessive pressure and wear on the Landfill vegetative service. The on-site engineer may construct ramps as necessary.

10. Construction Precautions: All necessary precautions shall be taken to protect the Landfill storm water control system, environmental monitoring network and the Landfill gas vents. All operators of vehicles entering the area should be clearly instructed by the on-site engineer and/or the Applicants' Contractor of the permit requirements to avoid damage to the Landfill components. The on-site engineer shall observe the extent of each excavation performed on the Landfill cover system. If any damage occurs to the any Landfill components, the Applicants' Engineer shall notify MassDEP within 24 hours and provide a written plan with a schedule for repairs.

11. Integrity of the Final Cover System: All disturbances of the Landfill shall be limited to the proposed excavations and installations as depicted and described within the Application and approved plans. Excavations shall be limited to the topsoil layer. No excavations shall penetrate the sand drainage layer during construction, including staking for concrete forms, or during operation and maintenance of the PV array without written approval by MassDEP. The Engineer and Applicants' Contractors shall ensure that vehicles operating on the Landfill surface do not compromise the integrity of the Landfill final cover system.

12. Personnel Training: The Applicants, Engineers and Applicants' Contractors shall instruct all personnel regarding the potential hazards associated with landfill gas and shall give on-the-job training involving in any activity authorized by this permit. Such instruction and on-the-job training shall teach personnel how to comply with the conditions of the permit to carry

out the authorized activity in a manner that is not hazardous to public health, safety, welfare or the environment.

13. Proposed Inverter/Transformer Concrete Pad (PowerStation) and Interconnection Equipment: The Applicants stated within the permit application that manufacturers "cut sheets" for the electrical equipment were included in Appendix B for informational purposes only and were only representative of equipment that is proposed. Final equipment selection may vary based on availability and other factors at the time of construction.

    If the Applicants propose to change the electrical equipment a copy of the final design for the inverter/transformer pad and any other electrical pads and protective switchgear (interconnection equipment) proposed on-site shall be submitted to MassDEP for review and approval. The Applicant, Engineers and Applicants' Contractors are responsible to ensure that utilities/structures will not accumulate landfill gas during construction and operation. There shall be no penetrations (utility, conduits or other) at the base of any concrete pads or foundations. There shall be no penetration of any kind of the impermeable layer of the final cover system.

14. Landfill Gas Notification Requirements:

    a. As specified in solid waste management regulations at 310 CMR 19.132 (4) (g),

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

        1. *Take immediate action to protect human health and safety;*
        2. *Notify the Department within two hours of the findings; and*
        3. *undertake the actions specified under 310 CMR 19.150, Landfill Assessment and 310 CMR 19.151: Corrective Action, as required by the Department."*

    b. 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 Applicants or Applicant's contractors shall notify MassDEP's Bureau of Waste Site Cleanup-Emergency Response Section (508) 946-2714 within two (2) hours of the exceedance as per 310 CMR 40.0321(1) (a) of the regulations.

15. Post-closure Use Operation and Maintenance Plan: During the first year after completion of construction of the PV array, inspections of the Landfill final cover system shall be performed on a monthly basis. Monthly inspection reports shall be submitted to MassDEP within fourteen (14) days of completion. Following the first year of operation of the PV array, and if no problems have been documented, inspections of the Landfill shall be performed on a quarterly basis and shall be submitted to MassDEP within **fourteen (14)** days of completion. Pursuant to 310 CMR 19.142(6) inspections shall be conducted by a third-party consulting Massachusetts Registered Professional Engineer, or other qualified solid waste professional. The

Applicants, Engineers and Applicants' Contractors shall monitor the effectiveness of the storm water management system which should include; swales, structures and any and all conveyance systems. MassDEP shall be consulted prior to any deviation from the approved storm water design. MassDEP may require a permit modification application for significant design modifications. Any erosion, settlement, security problems or other issues observed at the Landfill shall be reported to MassDEP and repaired immediately.

16. Entries and Inspections: In accordance with *310 CMR 19.043: Standard Conditions*, MassDEP and its agents and employees shall have the right 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.

17. Beneficial Use Determination - C&D Processed Soils: The Applicants shall ensure that handling, transportation of the processed soils will not create nuisance conditions such as dust. Stockpiling of processed soils shall be limited to the Landfill footprint. Fugitive dust levels shall be kept to a minimum through the use of best management practices. The construction contractors health and safety plan shall include information regarding the C&D processed soils (**refer to condition # 7 and attachment**)

18. Below Grade Conduit Detail: The Applicants shall provide a detail for all underground conduits located on the final cover system within **ninety (90) days** of the date of this letter. An underground conduit is depicted on Drawing # C-2 on the (Type B) final cover system.

19. Reservation of Rights: MassDEP reserves the right to require additional assessment or action, as deemed necessary to protect and maintain an environment free from objectionable nuisance conditions, dangers or threats to public health, safety and the environment. MassDEP reserves all rights to suspend, modify or rescind this permit if it determines the solar array compromises the integrity of the final cover system and/or results in a threat to public health, safety or the environment.

This approval pertains only to the Solid Waste Management aspects of the proposal within the Site and does not negate the responsibility of the owners or operators to comply with any other local, state or federal laws, statutes and regulations or enforcement actions, including orders issued by another agency now or in the future. Nor does this approval limit the liability of the owners or otherwise legally responsible parties from any other applicable laws, statutes or regulations now or in the future.

RIGHT OF APPEAL

Right to Appeal – This approval has been issued pursuant to M.G.L. Chapter 111, Section 150A, and 310 CMR 19.037: Review Procedures for Permit Modifications, Permit Renewals and other Approvals, of the "Solid Waste Management Regulations". Pursuant to 310 CMR 19.037(5), any person aggrieved by the issuance of this determination 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 receipt of the final permit. The standing

of a person to file an appeal and the procedures for filing such an 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 permit by a court of competent jurisdiction, the permit decision shall remain effective or become effective at the conclusion of the thirty (30) day period.

Notice of Appeal - Any aggrieved person intending to appeal a grant of a permit to the Superior Court shall first provide notice of intention to commence such action. Said notice of intention shall include the Department transmittal number X238588 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 the Department and the Regional Director for the regional office which processed the permit application at least five days prior to the filing of an appeal.

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

David Johnston, Regional Director
Department of Environmental Protection
20 Riverside Drive
Lakeville, MA 02347

No allegation shall be made in any judicial appeal of a 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.

Please direct any questions regarding this matter to me at (508) 946-2833 or to Mark Dakers at (508) 946-2847, or Dan Connick (508) 946-2884 or write to the letterhead address.

Very truly yours,

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.

David B. Ellis, Chief
Solid Waste Management Section

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Attachment: September 30, 1996 MassDEP approval

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