Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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December 27, 2016

Gordon L. Deane
CohSolar LLC.
13 Elm Street, Suite 200
Cohasset, MA 02025

&

Brain Joyce, Director Public Works
Town of Cohasset
91 Cedar Street
Cohasset, MA 02025

RE: Final Approval
Application for: BWP SW 36 Post-Closure Use - Major Ground Mounted Solar Photovoltaic (PV) Array
Transmittal #: X271354

AT: Cedar Street Landfill
81 Cedar Street
Cohasset, MA 02025
Facility ID #: 39173 Regulated Object #: 172425

Dear Mr. Deane and Mr. Joyce:

The Massachusetts Department of Environmental Protection, Solid Waste Management Section (the "MassDEP"), has completed its Administrative and Technical review of the referenced Post-Closure Use permit application (the "Application") for the Cedar Street Landfill (the "Landfill") located at 81 Cedar Street in Cohasset, Massachusetts.

On October 31, 2016, MassDEP determined that the Application was administratively complete. MassDEP has now determined the Application and supplemental submittals are technically complete and hereby **Approves** the Post-Closure Use of the Landfill for a 0.56 megawatt ("MW") DC solar photovoltaic ("PV") array, subject to conditions as specified herein.

I. SUBMITTALS:

The Application consists of bound report submitted on October 26, 2016, and supplemental information consisting of the following:

1) A completed BWP SW 36 Post Closure Use permit application form signed by Brian Joyce, Cohasset Director of Public Works, and Gordon L. Deane President, CohSolar, LLC. and signed and stamped by Richard J. Tabaczynski (Massachusetts Registered Environmental Engineer No. 33746), Vice President, Atlantic Design Engineers, Inc.;
2) A bound report containing a project narrative, a Lease Agreement and Landfill related historical documents;
3) Five site plan drawings (36" x 24") prepared by Atlantic Design Engineers Inc. ("Engineer") signed and stamped by Richard J. Tabaczynski, PE.;
4) Four electrical drawings (36" x 24") prepared by Power Engineers LLC signed and stamped by David J Colombo, Massachusetts Registered Electrical Engineer No. 40426;
5) A Geotechnical Report and a Stability Report prepared by McArdle Gannon Associates, Inc., signed and stamped by Wayne A. McArdle Massachusetts Professional Civil Engineer No. 41835;
6) Six racking system drawings (24" x 36") by Polar Racking, signed and stamped by Paul K. Zacher, Massachusetts Structural Engineer, No. 50100;
7) A Stormwater Drainage Analysis prepared by Atlantic Design Engineers, Inc.;
8) A Structural Engineering Design Report for the Photovoltaic Panels prepared by PZSE Structural Engineers, Inc.;
9) One revised electrical drawing (E-2) prepared by Power Engineers, Inc. and submitted via e-mail to MassDEP on November 3, 2016;
10) Landfill test pit results prepared by CDM Smith dated August 19, 2016, and submitted via e-mail to MassDEP on November 3, 2016;
11) E-mail responses to MassDEP comments e-mailed to CohSolar, LLC. on November 2, 2016, received by MassDEP on November 3, 2016, consisting of a revised electrical plan and a CDM Smith test pit report;
12) E-mail responses to MassDEP comments e-mailed to CohSolar, LLC. on November 2, 2016, received by MassDEP on November 22, 2016, consisting of an Atlantic Design Engineers, Inc. response letter, revised site plans, revised electrical plans, and revised stormwater analysis;
13) E-mail responses to MassDEP's November 23, 2016, e-mail comments, received by MassDEP on November 23, 2016, regarding fire department standpipe in lieu of fire department vehicle access to top of the Landfill;
14) E-mail from PZSE Structural Engineers received by MassDEP on December 9, 2016, regarding PZSE's review of the final PV array layout;
15) E-mail response to remainder of MassDEP comments e-mailed to CohSolar, LLC. on November 2, 2016, received by MassDEP on December 12, 2016; and
16) E-mail response to MassDEP's December 15, 2016 comments regarding the PZSE structural analysis, received by MassDEP on December 20, 2016.

II. APPLICATION REVIEW AND DECISION PROCESS:

The Application was submitted and reviewed pursuant to the provisions of 310 CMR 19.029(2): Applicable Permit Procedures and 310 CMR 19.033: *Permit Procedure for an Application for a Permit Modification or Other Approval*. According to these review procedures, MassDEP's decision regarding the proposed activities shall be either: a "Provisional Decision" pursuant to 310 CMR 19.033(4)(a); or a non-provisional decision pursuant to 310 CMR 19.033(4)(b). MassDEP has determined that a non-Provisional Decision is appropriate for this Application.

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* (the "Manual"). Based on this MassDEP issued Administrative completeness letter on October 31, 2016.

III. SITE DESCRIPTION:

The Landfill is located at 81 Cedar St in Cohasset, Massachusetts on a single parcel of land approximately 43.8 acres out of which 8.7 acres is capped Landfill. The final cover system of the Landfill was designed to include:

- 6-inch coarse sand gas venting layer, overlain by
- 40-mil High Density Polyethylene (HDPE) flexible membrane layer (FML), overlain by
- 12-inch coarse sand drainage layer, overlain by
- 8-inch topsoil cover

CDM Smith Inc. Test Pit Evaluation: CDM Smith Inc. performed nine shallow hand excavated test pits to confirm the Landfill capping system layer thickness above the HDPE membrane including five test pits in the top plateau area of the Landfill in the area of the proposed solar array and four test pits along the centerline of the proposed access road. Test pit results indicate that the total soil cover over the HDPE geomembrane is less than the design depth of 20 inches in certain areas of the landfill cap. The total depth of soil cover over the HDPE geomembrane ranged from to 15 to 22 inches. Topsoil cover depth ranged from 4 to 10 inches and the coarse sand drainage layer ranged in thickness from 7.5 to 13 inches.

A passive landfill gas collection system was installed consisting of 800 feet of landfill gas vent trench backfilled with ¾" to 1" crushed stone with 6" diameter HDPE pipe installed in the center of the trench.

A Closure Certification Report was prepared by Camp Dresser & McKee and submitted to MassDEP. MassDEP has not issued a determination that the Landfill closure has been completed pending the resolution of an on-site wetlands related issue. MassDEP has determined that the proposed PV array will not affect the resolution of the wetlands issue.

IV. POST-CLOSURE USE SOLAR ARRAY PROPOSAL SUMMARY:

Town of Cohasset ("Town" and "Owner") is the owner of the Landfill and entered into a Lease Agreement with CohSolar LLC ("CohSolar") to construct the ground solar photovoltaic array at

the Landfill. Hereinafter, CohSolar and Town shall jointly be referred to as the “Applicants”. The Applicants and all construction and maintenance personnel associated with the solar photovoltaic installation on the Landfill shall be referred to as the "Applicants’ Contractors".

The Applicants have proposed to develop a 0.56 MW DC solar photovoltaic (“PV”) array installation on approximately 1.7 acres of the 8.7 acre Landfill.

PV Array Design:

- Approximately (1,536) 365 Watt Solar LG 365N2W-B3 - PV modules;
- (24) 20kW SolarEdge SE20KUS, or equivalent;
- One 500 kVA Pad-Mounted Transformer;
- Polar Racking Dual-Post System;and
- Precast Concrete Ballasts (13 ft long, 2.5 ft wide and 1.25 ft to 1.67 ft in height)

The Applicants submitted a preliminary racking plan. A final racking plan will be submitted after finalization of the PV system design.

As currently designed, the PV array system will consist of 1,536 LG Solar LG 365N2W-B3 PV modules (“panels”), or similar modules each rated at 365 Watts.

A ballasted, ground mounted racking system, designed by Polar Racking Inc., was proposed with panels mounted at a 20° tilt from horizontal and with each racking section facing a 190° azimuth (10° west of due south). Each panel will measure 6.4 feet by 3.3 feet and will be installed with 16 panels (2 panels high by 8 panels wide) per rack. Each section of the array will include three ballasts foundations for support. The proposed ballasts are 13 feet in length by 2.5 feet wide with thicknesses ranging from 1.25 feet to 1.67 feet as determined by PZSE Structural Engineers (“PZSE”) and vary in size depending on the location of the racking section within the array.

The racking design includes 13 individual rows of racking sections spaced approximately 7.5 to 14.0 feet apart in the north-south direction to reduce shadow impacts and allow for adequate Landfill final cover system and solar facility maintenance. Racking sections will be placed at a minimum of 4 inches apart in the east west direction to allow for Landfill settlement. Panels will be installed with a 10 foot offset from landfill gas ventilation pipes and a greater than 100 foot offset from the surrounding wetland areas.

Power Engineers LLC. completed preliminary electrical engineering design for this project. As designed, the 16 panels located on a single racking section of the ballast mounted system will be strung together to create a single ‘string’. A total of 4 strings will be combined at a single pre-designated location where a 20 kW inverter (SolarEdge SE20KUS or equivalent) will be located and convert DC current to AC current. A total of 24 string inverters are proposed.

Cables from the inverters will be mounted in above ground cable trays supported by above ground ballast supports and will terminate at an on-cap equipment pad.

A 500 kVA pad mounted transformer, 600A switchboard, panel board, revenue grade meter, and customer disconnect switch will be located on the equipment pad located southwest of the solar array, adjacent to the proposed access road.

As shown on Electrical Drawing E-4, prepared by Power Engineering, LLC as revised on November 14, 2016, a reinforced concrete equipment pad will be constructed above the Landfill final cover system. Grounding wires and plates will be placed on top of the existing Landfill surface and overlain by additional topsoil. A geomembrane will be placed within the new top soil extending beyond the limits of the overlying concrete pad to prevent the migration of landfill gas along the electrical conduits and through the concrete pad and into the electrical equipment. The geomembrane will be protected on both sides with sand or a geotextile to prevent puncture. Crushed stone of sufficient thickness to facilitate installation of the electrical conduits will be placed above the new topsoil. The above ground conduits will enter the edge of the crushed stone, run above the geomembrane and beneath the concrete pad, turn 90 degrees to vertical and be cast into the concrete pad. The top of the concrete pad will be a minimum of 26 inches above the top of landfill surface. Concrete housekeeping pads will be installed on the concrete pad to support the electrical equipment.

Grounding will be completed in accordance with Section 690.43(C) of the National Electric Code (NEC). Inverters, racking and panels will be electrically grounded via the cable tray to shallow grounding plates installed near the equipment based on actual soil testing and ground testing on the landfill during the construction phase.

The transformer will be connected to existing utilities at the main road by running an aboveground 15kVA primary cable using PVC-80 conduit (4”). The above ground cable run is proposed to minimize landfill impacts as well as to mitigate disturbance to any potential for gas migration at the landfill and will continue until approximately 10 feet beyond the landfill cap’s HDPE Boundary. At this point, the interconnection wire run will consist of overhead lines on new utility poles. The interconnection wire run will terminate at the point of interconnection at existing utility pole. An Interconnection Service Agreement between Massachusetts Electric Company (doing business as National Grid) and CohSolar was executed on July 25, 2016.

As a condition of this permit, details of all electrical work must be submitted to MassDEP and must be designed in accordance with the most recent versions of the Massachusetts Electrical Code. All electrical permits must be secured from the local building official. (refer to Condition #2)

In order to avoid unnecessary disruption of the Landfill final cover system, a lull telescopic forklift will be used to transfer ballasts, racking, and panels onto the Landfill. The Applicants are requiring that the contractor confirm that the specific lull used during construction will not exceed the 7 psi threshold for pressure on the Landfill final cover system.

Installation of each ballast block may require the removal of existing vegetation and a maximum of 4 inches of topsoil. Crushed stone gravel will replace the removed soil to level the ballast blocks and racking. Following rack and panel installation, impacted vegetated surfaces will be repaired and seeded as soon as reasonably possible to minimize the potential for erosion.

Bearing Capacity and Settlement:
Based on information provided by PZSE, Inc. ("PZSE"), McArdle Gannon Associates ("MGA") determined that the maximum un-factored bearing pressure on footings will be approximately 386 pounds per square foot (psf) (2.7 psi), including snow and wind loading. The Applicants state a maximum ground pressure of 7 psi is recommended for construction equipment to prevent damage to the Landfill final cover system.

MGA performed analysis to estimate the amount of settlement of the Landfill waste and capping materials due to the added weight loading of the PV array and concluded that the settlement is expected to be elastic, occur relatively quickly, and not exceed ½ inch. MGA further concluded that settlement of the Landfill waste will continue and differential settlement may occur such that the PV array should be designed to accommodate significant settlement. As a condition of this permit MassDEP is requiring a pre-construction inspection of the Landfill for existing settlement and repair of settled areas. (refer to Condition #6). MassDEP is also requiring monthly inspections of the PV array area of the Landfill for the first year after completion of construction and quarterly inspections thereafter (every three months) to monitor for issues including settlement. All settlement must be repaired. (refer to Condition #18).

Slope Stability:
MGA's performed slope stability calculations based on a maximum 15 percent (8.5 degree) Landfill slope. The thinnest cover soil profile determined by the CDM Smith Inc. test pit evaluation and saturated conditions of the drainage sand layer were considered for the downhill slopes in the north/south and east/west directions. The maximum bearing stress was based on factored loading conditions (dead + 0.75 snow + 0.75 wind) provided by PZSE. The effects of the proposed solar array on the stability of the existing MSW landfill slope was evaluated using the limit equilibrium based software program Reinforced and Unreinforced Slope Stability Analysis (ReSSA) by Adama Engineering, Inc.

Estimated factors of safety were compared to criteria outlined in the US Army Corps of Engineers "Slope Stability" manual (EM 1110-2-1902). This reference recommends the following minimum factors of safety:

- 1.5 for normal, long term loading conditions
- 1.3 for short-term or transient loading conditions (i.e., groundwater buildup above the liner in sand drainage layer)

MGA stated the stability evaluation results indicate that the factors of safety with respect to both deep seated and shallow/veneer failures are above the minimum recommended values.

PZSE performed a foundation analysis in accordance with the international Building Code, 2009 Edition, considering existing Landfill conditions including the maximum 15 degree slope using applied wind loads derived from wind tunnel analysis. A static analysis of the environmental loads on the PV array foundation was conducted to determine the imposed sliding force, uplift and downward forces and overturning moment demands specific to various zone of the Landfill. PZSE determined that an effective safety factor of 1.5 is adequate for this type foundation and stated that based on the Landfill site conditions and the analysis performed, the foundation system has adequate structural capacity for the applied loads.

Landfill Access:

The Applicants have proposed to construct a new permanent 12 foot wide access road with 1 foot shoulders extending from the Landfill base to the top plateau area where a 35 foot by 40 foot parking area will be constructed. The access road and parking area will consist of a Mirafi HP370 Geotextile, or equivalent, placed over the existing Landfill final cover soils and overlain by 12 inches of sand and gravel per MassDOT M1.03.0 Type B, overlain by 6 inches of ¾ inch durable crushed stone or gravel meeting the gradation requirements per MassDOT M2.01.4. A series of four test pits were excavated in the area of the access road and parking area and indicated a minimum of 16 inches of existing soils above the final cover system geomembrane. Combined with the proposed 18 inches of additional materials the minimal material thickness of material above the geomembrane is estimated to be 32 inches.

The shoulders and tapered sides of the access road will be loamed and seeded. A 2 foot wide drainage swale will be installed on one side of the gravel road consisting of a Mriafi FW402 woven monofilament geotextile, or equivalent, overlain by 6 inches of 50 to 125 pound rip-rap stone.

A culvert consisting of two 6-inch diameter ADS HDPE pipes will be installed at the base of the access road to convey stormwater flow at the perimeter of the Landfill. At the request of the Cohasset fire department, a dry stand pipe line will be installed above grade along the access road to the parking area.

The access road will be posted restricting its use to low ground pressure equipment (7 psi or less).

Storm Water:

The existing stormwater management system for the Landfill consists of vegetated diversion berms, rip-rap settling areas with culverts, vegetated drainage swales and a stormwater basin. Stormwater runoff that is collected and conveyed by the drainage swales is detained within the stormwater basin located to the east and outside of the limit of the landfill final cover system. In the western portion of the Landfill site, stormwater runoff is discharged off-site.

The proposed project includes the construction of an access road over the existing Landfill final cover system extending northerly from the terminus of the existing gravel access road to near the peak of the landfill. A two foot wide stone/rip-rap channel is proposed along the eastern edge of the access road. The proposed access road will cross the existing vegetated drainage swale. To conduct stormwater flow in this area, a culvert consisting of a 12 inch ADS HDPE pipe has been designed for installation under the access road in order to continue to allow the swale to discharge the stormwater without being impeded by the roadway. To properly size the culvert under the access road and swale adjacent to the access road, stormwater calculations were performed for a 24-hour storm event using HydroCAD, a hydrology and hydraulics program based on TR-20 and TR-55 methodologies of estimating stormwater runoff characteristics.

Based on the proposed ballast system the underlying crushed stone base, and the channel and culvert proposed at the access road, the Applicants state the existing Landfill surface and stormwater runoff management system should not be impacted by the proposed project.

Wetlands Areas:
The location of the PV array on the Landfill is at least approximately 80 feet from the 100 foot buffer setback for Wetlands. Installation and operation of PV array panels should not affect the wetlands in the nearby vicinity.

During construction, biodegradable silt socks will be placed in areas where sediment and water flow may come in contact with wetland areas. Sand bags will be placed every ten feet to secure the silt socks. No wooden stakes will be used above the landfill final system. (refer to Condition #15)

Site Security: The Applicants have not proposed to install a security fence around the Landfill or to enclose the PV array area or equipment pad with fencing. Pursuant to MassDEP's solid waste regulations, the Town is required to provide sufficient fences or other barriers to prevent access to the Landfill except at designated points of entry or exit. Accordingly should MassDEP observe unauthorized access, MassDEP will require additional security measures. (refer to Condition #19)

As conditions of this permit all electrical work must meet electrical codes, including security requirements, and any fencing proposed at the PV array or the equipment pad must be submitted for MassDEP review and approval. (refer to Conditions # 2 and #5)

Post Closure and Post-Closure Use Operations and Maintenance: 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. The Town will continue to maintain the Landfill areas outside the array area. The Applicants state that a 6 foot setback around the array creates a reasonable boundary to define the limit of responsibility between the Town and CohSolar and that this setback will be shown on final record drawings after construction.

As a condition of this permit, MassDEP is requiring that, during the first year of operation of the PV array, inspections of the Landfill final cover system be performed on a monthly basis and thereafter quarterly, at a minimum. MassDEP is also requiring that inspections include the condition of the security fencing. (refer to Condition #18)

Health and Safety:
As stated in the Application, and as a condition of this permit, MassDEP is requiring that a Solar Array Construction Period Health and Safety Plan and a Post Closure Operations and Maintenance Health and Safety Plan be submitted and that personnel training be provided for employees who access the solar array areas of the Landfill. (Refer to Condition #10)

Massachusetts Endangered Species Act: The Applicants contacted the Massachusetts Division of Fisheries and Wildlife ("DFW"), Natural Heritage and Endangered Species Program ("NHESP") and stated that the DFW concluded that the MassGIS mapped sites are current and the site does not contain any NEHSP mapped areas.

Decommissioning Plan: A February 2015 Site Lease Agreement between the Town and CohSolar was submitted within the Application and provides for a 20 year lease of the Landfill site for a PV array. The lease agreement requires CohSolar to decommission the solar energy

facility, remove the permitted improvements, and return the premises to approximately their original condition, except as specified in the Site Lease Agreement, unless the Town purchases the solar energy facility at the end of the 20 year lease. MassDEP is requiring that MassDEP be notified and provided with full details of the proposed actions. (refer to Condition # 21).

V. PERMIT DECISION WITH CONDITIONS:

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 Cedar Street Landfill for a Solar Photovoltaic Array subject to the conditions identified herein.

1. Permit Limitations: The issuance of this approval is limited to the proposed Solar Photovoltaic Array at the Landfill as detailed in the Application and does not relieve the Applicants from the 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. MassDEP shall be consulted prior to any deviation from the approved design. MassDEP may require a permit modification application for significant design modifications.

2. Pre-Construction submittals: Prior to construction, the Applicants shall submit the following to MassDEP for its review and approval at least 60 days prior to commencing construction activities, unless otherwise approved by MassDEP:

    a) A final PV array layout plan with an accompanying statement that the engineering assumptions regarding stability, sliding, and the potential for glare impacts made in the Application, or as revised in the supplemental submittals, are consistent with the final PV array layout;
    b) Final electrical drawing(s), prepared, signed and stamped by a Massachusetts Registered Professional Engineer, depicting the layout and details of all electrical equipment, all conduit supports, all conduit details, all equipment pads, utility poles, etc, (including any addition of security fencing around the PV array or equipment pad). The equipment pad, and all underground conduits (if any), must be designed to be explosion proof and prevent landfill gas from entering the electrical equipment;
    c) A narrative describing the final electrical design, including manufacturer's catalog cuts of major electrical components: panel, inverters, and transformers;
    d) A statement from the Engineer that the engineering assumptions made in the Application, (or as revised in an accompanying Engineer's submittal) are consistent with the final PV array layout including the equipment weight, reaction forces, and maximum Landfill slope in areas of installation of the PV array,
    e) The electrical permit(s) from the local building official, and

f) A copy of the site specific health and safety plan for the post-closure use CONSTRUCTION phase as described in Condition #10 (for MassDEP files, not approval).

3. PV Array Installation: As submitted within the Application including supplemental information, the PV array racking system foundations have been designed to be installed on landfill slopes up to 15 degrees from horizontal. Prior to the installation of any ballast blocks at slopes greater than these design slopes, supplemental design information must be submitted by a Massachusetts Registered Professional Engineer including an analysis of the maximum loading on the racking system at the proposed racking system orientation, an analysis of the ballast block design for overturning and sliding and a slope stability analysis.

4. Enclosures and Combustible Gas Alarms: Any enclosures that that allow human entry shall have a landfill gas monitor that is fully operational at all times. The monitor shall be calibrated to a methane standard; have an audible and a lighted beacon. At a minimum, the alarm shall be set to sound when the concentration of explosive gases exceeds 10% of the Lower Explosive Limit (LEL).

5. Regulatory Compliance: The Applicants, Engineer 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", as amended.

6. 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 prior to installation of the PV array. Any area repaired shall be surveyed and the location marked on a plan with the pond value. Any future settlement shall be repaired and 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 on the low permeability layer 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, geosynthetic clay liner (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 report the settlement to MassDEP and state 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.

7. Notification of Construction: The Applicants shall notify MassDEP, Southeast Regional Office solid waste section chief, in writing (e-mail is acceptable) when the post-closure use construction commences and again when construction is completed.

8. Certification Report: Within ninety (90) days of completing the installation of the solar photovoltaic array, MassDEP shall be provided with a certification report for MassDEP's records. 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. 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. The report shall include a project narrative, as-built drawings depicting all pertinent site features and photographs representative of the construction processes and completed work. A list of equipment used on the Landfill, the Landfill area accessed by the vehicle, and the pressure rating of each vehicle shall be indicated in the certification report. Should the Applicants desire a formal review and written approval of the certification report, the Applicants must submit a formal BWP SW 43, Landfill Closure Completion permit application.

9. Preconstruction Work: Prior to commencement of construction activities, all Landfill gas extraction wells, remote valves, Landfill 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.

10. 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 site specific Solar Array Construction Period Health and Safety Plan shall be developed and submitted to MassDEP (for its files) prior to the beginning of any construction work. The Solar Array Construction Period Health and Safety Plan shall include at a minimum;

    - protocols for monitoring of landfill gas as needed,
    - protocols for modifying work practices if landfill gas is detected at levels deemed unsuitable, and
    - training for all workers including the Applicants workers conducting construction activities at the Landfill regarding hazards associated with the landfill gas and the PV array, including electrical hazards.

    A site specific Post Closure Operations and Maintenance Health and Safety Plan for the post-closure use period, shall be developed and submitted to MassDEP (for its files) prior to the beginning of any construction work. The Post Closure Operations and Maintenance Health and Safety Plan shall include at a minimum;

    - protocols for monitoring of landfill gas as needed,
    - protocols for modifying work practices if landfill gas is detected at levels deemed unsuitable, and
    - training for all workers including the Applicants workers conducting maintenance activities at the Landfill regarding hazards associated with the landfill gas and the PV array, including electrical hazards.

11. Personnel Training: The Applicants, Engineers and Applicants' Contractors shall instruct all construction and maintenance 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.

12. Landfill Gas Notification Requirements:
    As specified in solid waste management regulations at 310 CMR 19.132 (5) (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 or operator shall:*
    >
    > 1. *take immediate action to protect human health and safety;*
    > 2. *notify the Department's Regional Office that covers the municipality in which the facility is located within two hours of the findings; and*

3. *undertake the actions specified under 310 CMR 19.150, Landfill Assessment Requirements and 310 CMR 19.151: Corrective Action, as required by the Department."*

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 Applicant shall notify MassDEP's Bureau of Waste Site Cleanup-Emergency Response Section (508) 946-2850 within two (2) hours of the exceedance as per 310 CMR 40.0321(1) (a) of the regulations.

13. Vehicles Operating on the Landfill Final Cover System: Vehicles operating on the Landfill final cover system shall be low-pressure construction equipment, with fully loaded ground pressures of **7 psi** or less. Site specific engineering calculation must be submitted prior to operation of any equipment with a bearing pressure of greater than 7 psi on the access roads above the Landfill final cover system.

    Construction equipment shall limit turning on the vegetative support layer as much as possible. If MassDEP determines the use of any equipment is creating the potential for damage to the final cover system, 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 equipment used on the Landfill, the Landfill area accessed by the vehicle, and the pressure rating of each vehicle shall be indicated in the certification report. (refer to Condition #8)

14. Permanent and Temporary Roads: 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 allow the construction of temporary ramps as necessary.

15. 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 without written approval by MassDEP. The Applicant, Engineer and Applicant's Contractors shall ensure that vehicles operating on the Landfill surface do not compromise the integrity of the Landfill final cover system. No grade stakes shall be used in the area of the Landfill final cover system for erosion control, construction layout, or any other purpose. No grounding rods for the PV array, electrical equipment, office trailers, etc. shall penetrate the landfill final cover system low permeability layer. The Applicants shall verify the limits of the Landfill final cover system prior to installation of any security fence, utility poles, etc. that are designed to be installed outside the limits of the final cover subsystem.

16. Construction Precautions: All excavations and construction shall be supervised by a Massachusetts Registered Professional Engineer. All necessary precautions shall be taken to protect the Landfill storm water control system, environmental monitoring network and the Landfill gas vents and other on-site structures. All operators of vehicles entering the construction 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 capping system. If any damage occurs to any Landfill components, the Engineer shall notify MassDEP within 24 hours and provide a written plan with a schedule for repairs.

17. Array Setbacks: The Applicants shall maintain a minimum 10 foot radius buffer between the closest edge of the PV array modules and all Landfill gas vents and a 10 foot radius buffer between the electrical equipment and all Landfill gas vents.

18. Post-closure Use Operation and Maintenance Plan: During the first year of operation of the PV array, inspections of the Landfill final cover system shall be performed on a monthly basis unless otherwise approved in writing by MassDEP. Inspection reports shall be submitted to MassDEP within fourteen (14) days of each inspection. Following the first year of operation of the PV array, inspections of the Landfill shall be performed on a quarterly basis, or on an annual basis as determined by MassDEP at that time, and inspection reports shall be submitted to MassDEP, the Applicants, (and the Landfill owner if not an Applicant) within fourteen (14) days of each inspection. The Applicants, Engineer and Applicants' Contractors shall monitor the effectiveness of the site security system and 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 problems, settlement problems, security or other issues observed at the Landfill shall be reported to MassDEP and repaired immediately. When noted, all settlement shall be repaired. (refer to Condition 6)

    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. Landfill inspections shall be conducted pursuant to 310 CMR 19.018(6)(b) every two years that evaluate the entire Landfill, the environmental monitoring system and summarize the inspection and monitoring information pursuant to 310 CMR 19.018(6) and (8) and submitted pursuant to 310 CMR 19.018(8)(c).

19. Site Security: Pursuant to 310 CMR 19.130(23) the Landfill Owner is required to provide sufficient fences or other barriers to prevent unauthorized access to the Landfill. The Owner must continually monitor and evaluate the potential for unauthorized access and institute all appropriate measures to prevent unauthorized access during the closure and post-closure period.

20. Transfer: No transfer of this permit shall be permitted except in accordance with the requirements of 310 CMR 19.044. The form established by MassDEP for permit transfers is the BWP SW 49 application form. Any time the Applicants for this project do not include a municipal entity, the Applicants shall provide to MassDEP a financial assurance mechanism,

in accordance with 310 CMR 19.051, for the costs of decommissioning and site restoration activities.

21. Decommissioning Plan – If the proposed PV Array project is abandoned, during or after completion of construction, the Applicants shall submit to MassDEP for review and prior approval a detailed decommissioning and site restoration plan, which includes, at a minimum: dismantling and removal of all panels and supporting equipment, transformers, overhead and underground cables, foundations and buildings; and restoration of the roads to restore the Landfill to substantially the same physical condition that existed prior to post-closure use construction, unless otherwise approved by the Town and MassDEP.

22. 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.

23. 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. MassDEP reserves the right to modify and re-issue this permit based on the site specific calculations to be performed for this Landfill.

    This approval pertains only to the Solid Waste Management aspects of the proposal 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.

VI. REVIEW OF DECISION

Pursuant to 310 CMR 19.033(4)(b), if the Applicants are aggrieved by MassDEP's decision to issue this decision, they may within twenty-one days of the date of issuance file a written request that the decision be deemed provisional, and a written statement of the basis on which the Applicants believe they are 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 days after MassDEP's receipt of the request. Such a request shall reopen the administrative record, and MassDEP may rescind, supplement, modify, or reaffirm its decision. If MassDEP reaffirms its decision, the decision shall become final decision on the effective date. Failure by the Applicants to exercise the right provided in 310 CMR 19.033(4)(b) shall constitute waiver of the Applicants' right to appeal.

VII. RIGHT TO APPEAL

Right to Appeal: This approval has been issued pursuant to M.G.L. Chapter 111, Section 150A, and 310 CMR 19.033: Permit Procedure for an Application for a Permit Modification or Other Approval, of the "*Solid Waste Management Regulations*". Pursuant to 310 CMR 19.033(5), any person aggrieved by the final permit decision, except as provided for under 310 CMR 19.033(4)(b), may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. Chapter 111, Section 150A and M.G.L. Chapter 30A no later than thirty days of issuance of the final permit decision to the Applicants. 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 be effective in accordance with the terms of 310 CMR 19.033(3).

Notice of Appeal: Any aggrieved person intending to appeal a final permit decision to the Superior Court shall first provide notice of intention to commence such action. Said notices of intention shall include MassDEP Transmittal No. X271354 and shall identify with particularity the issues and reason why it is believed the final permit decision was not proper. Such notice shall be provided to the Office of General Counsel of MassDEP and the Regional Director for the regional office which processed the permit application, if applicable at least five days prior to filing of an appeal. The appropriate addresses to send such notices are:

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

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

No allegation shall be made in any judicial appeal of a final 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 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) 946-2847 or Hersh Thakor (508) 946-2715 or write to the letterhead address.

Very truly yours,

Mark Dakers, Chief
Solid Waste Management Section
Bureau of Air and Waste

D/HT/

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