



To: GMP Milton Microgrid Project File

Date: November 1, 2017

Memorandum

Project #: 57992.00

From: Lydia Lee, PG

Re: Section 248 Waste Disposal Technical Memorandum

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At the request of GMP Microgrid-Milton LLC ("GMP" or "Petitioner"), VHB has prepared this memorandum to provide technical information related to a 4.99 megawatt ("MW") alternating current ("AC") ground mounted solar electric generating facility, as well as a co-located 2 MW battery storage system (collectively the "Project"). The Project is sited on approximately 30 acres of the existing agricultural field located at 127 Mears Road in Milton, Vermont ("Site" or "Project Site"). The content of this technical memorandum presents the results of an assessment of the Project as it relates to the following Act 250 Criteria, given due consideration by the Vermont Public Utility Commission ("PUC") under 30 V.S.A. Section 248 review for a Certificate of Public Good ("CPG"):

- Waste Disposal (Section 248(b)(5) / 10 V.S.A. § 6086(a)(1)(B))
- Soil Erosion (Section 248(b)(5) / 10 V.S.A. § 6086(a)(4))

## PROJECT DESCRIPTION

As depicted on the Project Site plans included in the CPG petition materials, the Project Site contains active agricultural lands consisting mainly of a hay field, with a few scattered patches of shrubs and un-mowed herbaceous plants amid placed boulders. The hay field is adjacent to primarily deciduous forest land to the north, south, and west of the Project Site. On-site topography moderately descends to the east and south. Access to the Project Site will be via an upgrade of an existing agricultural road to a new gravel access road off Mears Road. The Project will involve the installation and operation of a 4.99 MW solar electric generation facility, as well as a co-located 2 MW battery storage system. In general, the Project components will include:

- Photovoltaic panels installed on fixed-tilt, pile-driven, post mounted racking systems within an approximately 30-acre fenced area. The solar panels will be coated with a non-reflective glazing to reduce glare from the array;
- String-mounted inverters, which will be mounted to the back of the racking frame, would convert the direct current ("DC") generated by the panels, to AC. The array will be connected to the inverters with electrical cable in conduit, which will then connect the inverters to two pad-mounted transformers, located within the Project area;
- Installing new components needed to interconnect the Project into Green Mountain Power's ("GMP") existing three-phase distribution service along Mears Road. New components include an underground distribution interconnection line extension, which would run from the transformer to the interconnection point at Mears Road;
- Utilizing a self-contained 2 MW battery storage system to be located east of the array near the pad mounted utility meter, recloser, and switch. The battery storage system would be housed on an approximately 26-foot by 34-foot concrete slab inside a metal box and surrounded by an 8-foot fenced enclosure with noise dampening material. Underground power will run from the Project and battery storage system and will connect to the existing three-phase distribution service along Mears Road;
- The proposed array site will be accessed by means of a new gravel access road which would be located in the same alignment of an existing, unimproved agricultural access road which extends northwest from Mears Road;
- Installing a perimeter fence at least 7 feet tall;
- During construction, materials and equipment will be staged along the eastern edge of the proposed array, within the Study Area (Study Area is depicted in VHB's Natural Resources Assessment Map, Exh MMG-CF-2).



## **SECTION 248 CRITERIA REVIEWED**

### Waste Disposal (10 V.S.A. § 6086(a)(1)(B))

The Waste Disposal criterion incorporated into Section 248 review provides that the Project must meet applicable health and Vermont Department of Environmental Conservation ("DEC") regulations regarding the disposal of waste, and must not involve the injection of waste materials into groundwater or wells. For the Project, VHB's consideration of waste disposal involves sanitary wastewater, stormwater runoff, and general construction waste including tree and brush debris. VHB's consideration of the injection of waste materials into groundwater or wells also involves the Project's storage of transformer oil and the potential for a leak or spill.

The Project will not need permanent sanitary waste treatment, will not require on-site sanitary waste treatment or use of public waste treatment facilities, and will not involve any on-site waste disposal or the injection of waste materials or any harmful or toxic substances into groundwater or wells.

The Project will generate minor amounts of scrap and waste material during installation, and this waste will be disposed of or recycled at an approved disposal facility in accordance with Vermont Solid Waste Management Rules and Procedures (DEC 2012). General construction waste generated during construction, such as office trash from the contractor's operations trailer, or from portable toilets, would be the responsibility of the contractor to dispose of properly. The Project is not anticipated to generate any wastes during operation.

Operational-phase stormwater discharge permit authorization is required under the VT DEC for discharges of regulated stormwater runoff to waters of the State from new development, redevelopment, and/or expansion of existing development that results in at least one acre of impervious surface. Existing impervious surfaces located within the Project parcel are related to farming, and are therefore exempt from inclusion in the impervious area for the Project. Proposed new impervious surfaces include the new gravel access road, concrete pads, and driven posts, totaling approximately 36,000 square feet (0.83 acres). Thus, the total impervious area is less than one acre and therefore does not trigger the threshold for requiring authorization by VT DEC under their operational-phase stormwater discharge permit.

The Project involves the installation and use of two 2,500 kVA pad-mounted, oil-filled transformers, the locations of which are shown on the Project Site plans which are included in the petition material. Each transformer would contain between approximately 400 and 700 gallons of non-hazardous vegetable-based dielectric fluid (FR3 or similar), resulting in the combined oil storage of approximately 800 to 1,400 gallons<sup>1</sup>. If the total volume of oil storage at the Project exceeds 1,320 gallons, the Project will be subject to Spill Prevention Control and Countermeasure ("SPCC") planning regulations under 40 CFR 112 ("SPCC Regulations"), and therefore, a SPCC Plan will be necessary for the Project. Regardless of the storage volume and SPCC Plan requirement, each transformer unit will be placed within a secondary containment structure to prevent the release of transformer oil to the environment. VHB understands that the containment structures will consist of a polyvinyl and barrier boom containment system sized to contain 110 percent of

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<sup>1</sup> Only containers with oil storage capacities equal to or greater than 55 gallons count toward the total oil volume.



Memorandum

the volume of oil in each transformer plus a minimum of five inches of freeboard. The barrier boom serves to allow rain water, but not oil, to discharge from the containment structure. If oil is discharged to the containment structure, the barrier boom will solidify and contain oil within the containment structure. If an SPCC Plan is not required, GMP would still respond to a spill or release in accordance with their spill response procedures. It is VHB’s opinion that the proposed conceptual design for the passive secondary containment structures is consistent with the requirements of 40 CFR 112, and the implementation of a SPCC Plan (if required) or GMP’s spill response procedures, will adequately reduce the risk of a discharge of oil to Waters of the U.S.

Though secondary containment will be constructed to prevent the release of oil to the environment, a VHB hydrogeologist evaluated the location of the fluid-filled transformers with respect to sensitive receptors near the Project. According to the Agency of Natural Resources (“ANR”) Natural Resources Atlas, there are no groundwater source protection areas or surface water source protection areas within the vicinity of the Project. The closest ANR-mapped water supply well is mapped in a location approximately 350 feet to the northeast of, and hydrologically up-gradient from the closest transformer. This bedrock water supply well is constructed with 20 feet of steel casing that sticks up above ground surface and extends below ground surface into four feet of overburden and then bedrock. The well’s construction inhibits the migration of contaminants into the well from surficial pathways. Additionally, the transformers are not located within wetlands, wetland buffers, streams, or stream buffers. The closest mapped wetland is a Class II wetland mapped by the Vermont State Wetland inventory (“VSWI”) which is located approximately 450 feet east and hydrologically down-gradient from the closest transformer. The closest mapped stream is located approximately 400 feet southeast and hydrologically down-gradient from the closest transformer. The proposed secondary containment structures would prevent the release of oil to waters of the U.S. or other sensitive receptors and the SPCC Plan, if required, or GMP’s spill response procedures will provide measures regarding response actions in the unlikely event of a release. Furthermore, the transformer fluid will be non-hazardous. Accordingly, VHB believes that the proposed transformers do not pose a potential for adverse impacts to sensitive receptors discussed herein.

As indicated above, the Project will meet the applicable health and DEC regulations regarding the disposal of waste that has been considered, and does not involve the injection of waste materials into groundwater or wells, therefore the Project will comply with this criterion.

Soil Erosion (10 V.S.A. § 6086(a)(4))

Act 250 Criterion 4, which is to be accorded due consideration as part of Section 248, requires a finding that the Project “will not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result.” (10 V.S.A. § 6086(a)(4)). Determination of compliance with this criterion involves two components: (1) preventing soil erosion, and (2) preventing a reduction in the land’s capacity to hold water.

According to the Natural Resources Conservation Service (“NRCS”) soils report, underlying soils within the Project Site are described in the table below:

<b>Soil Classifications Located Within the Project Site</b>		
<b>Soil Classification</b>	<b>K-value</b>	<b>Hydrologic Soil Group</b>
Farmington-Stockbridge rocky loams, 5 to 12 percent slopes	0.28	C/D
Farmington-Stockbridge rocky loams, 12 to 20 percent slopes	0.28	C/D
Farmington extremely rocky loam, 5 to 20 percent slopes	0.28	D



## Memorandum

Erodibility ratings (or "K-values") indicate the susceptibility of soil to erosion by water. Values typically range from 0.02 to 0.69, with higher values more susceptible to erosion. Soils with K-values that are greater than 0.17 but less than 0.36, such as those that underlie the Project Site, are generally considered to have a moderate risk of erodibility per the Vermont Standards and Specifications for Erosion Prevention and Sediment Control (DEC, 2008). These risks related to potential soil erodibility are intended to be minimized via implementation of erosion and sediment control measures, which are further described below.

Hydrologic soil groups ("HSG") established by the NRCS are based on estimates of runoff potential, with four classifications (A, B, C, and D) based on their rate of water infiltration under certain conditions, with HSG A having the least runoff potential and HSG D having the greatest runoff potential. The Project Site is primarily underlain by HSG C and D soils. Those soils that are part of HSG C typically have a slow infiltration rate and may contain a layer that impedes downward movement of water or soils with moderately fine texture or fine texture. Those soils that are part of HSG D typically have a very slow infiltration rate and typically consists of clay soils, soils with a high-water table, and/or soils with a claypan or clay layer at or near the surface. Implementation of erosion and sediment control measures will take these factors into consideration in order to reduce potential for runoff.

For Project construction, earth disturbance is necessary for the new access road, new concrete pads associated with the transformers and the battery storage equipment, underground electric lines, and use of a laydown/staging area, totaling approximately 77,000 square feet (1.77 acres).

As a Project with greater than one acre of earth disturbance, coverage under the DEC Construction General Permit 3-9020 is required. Based on the Project size, soil type, slope, and design, the Project would be defined as a Low Risk project by DEC. As such, the Project will employ the measures contained in the *Low Risk Site Handbook for Erosion and Sediment Control* (DEC, 2006) to manage stormwater runoff from areas of exposed soil during construction. In turn, implementation of these measures will minimize the potential for sediment-laden runoff to reach the nearby receiving waters, thereby addressing the moderate erodibility ratings associated with some of the soils that underlie the Project Site. Examples of EPSC measures to be implemented include: project demarcation (e.g., construction fence and flagging) along the perimeter of the Project Site, silt fence between the Project Site and nearby receiving waters, stabilized construction entrance/exit, and on-going stabilization of exposed soil using seed and mulch, seed and rolled erosion control product ("RECP"), and/or stone surfaces. VHB recommends that the Project or host landowner consider application of a standard hayfield/forage or permanent conservation seed mix for agricultural land site stabilization as necessary ahead of construction to establish a hayfield condition.

Based on evaluation of the proposed Project, with the implementation of erosion control measures and coverage under the General Permit 3-9020, it is VHB's opinion that the Project will not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition results.



**References:**

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