



October 17, 2016

Ref: 57746.02

Ms. Zapata Courage  
District Wetlands Ecologist  
Vermont DEC – Watershed Management Division  
1 National Life Drive, Main 2  
Montpelier, VT 05620-3522

Re: BDE Grand Isle Solar Project  
BDE Grand Isle LLC (“BDE”)  
Grand Isle, Vermont  
Revised Application for a Vermont Wetland Individual Permit (#2015-520)

Dear Zapata:

On behalf of BDE Grand Isle Solar, LLC (“BDE”), VHB is electronically submitting the complete, revised application form and supporting materials to the Vermont Department of Environmental Conservation (“DEC”) Wetlands Program requesting a Vermont Individual Wetland Permit per the Vermont Wetland Rules pursuant to 10 V.S.A. § 6025(d)(5), to authorize activities related to the construction and operation of the Grand Isle Solar Project (the “Project”).

In an effort to avoid further contest with the DEC Wetlands Program, BDE has made extensive Project revisions, based on communications and meetings with you and others at the Agency of Natural Resources (“ANR”), in order to further avoid impacts to Class II buffers within the Project site. Below is a summary list of those changes to the Project, impacts on the Project.

- Re-align rows of solar panels in both Array 1 (western array) and Array 2 (eastern array) so that all panels are out of the adjacent Class II wetland buffer; this shift will result in additional shading of panels along the western edge of Array 1 and the eastern edge of Array 2, and a loss in production.
- Removal of 1,144 panels from the proposed Project layout to ensure all panels are out of the Class II wetland buffer.
- Shifting the perimeter fence further out of the buffer, and reducing the area of the Class II buffer which is located within the perimeter fence (see Table 1 below, revised/updated from table originally provided in the original application with the Alternatives, Avoidance, and Minimization memorandum).

40 IDX Drive, Building 100  
Suite 200

**Engineers | Scientists | Planners | Designers**

South Burlington, Vermont 05403

**P** 802.497.6100

**F** 802.495.5130



- Agreeing to certain operational vegetation management conditions as was discussed.
- Revisions to the proposed Vegetation Management Plan as per discussion.

<b>Table 1. Comparison Summary of Proposed Areas in Class II Wetlands and Buffers (Revised)</b>					
<b>Plan Version</b>	Number of Solar Rack Posts in Class II Buffer	Resource Areas Within Perimeter Fence			
		Class II Wetland		Class II Buffer	
		(Sq Ft)	(Acre)	(Sq Ft)	(Acre)
Section 248 Permit Plan (revised January 11, 2016)	276	17,136	0.39	96,651	2.22
Permitting Plan (dated May 23, 2016)	139	0	0.00	43,741	1.00
Permitting Plan (date October 14, 2016)	0	0	0.00	26,305	0.60

Based on the fee calculations provided on the application form, the required fee for the revised Project application is \$7,070.25. The Applicant has already submitted payment totally \$7,085.25 for the original application fee, which is an overpayment for the proposed Project, however a refund is not requested.

Thank you for your assistance providing input as this Project was developed, and your timely review of the enclosed materials. It is the Applicant's understanding that with the proposed Project revisions, the DEC's concerns over project avoidance/minimization and impact mitigation have been addressed. Please do not hesitate to contact us if you have any questions, comments, or require further information regarding the enclosed Vermont Wetland Permit Application and supporting materials.

Sincerely,

Patti Kallfelz-Werts  
Environmental Scientist

Adam R. Crary, PWS, PWD  
Senior Ecologist

PBW/ARC/jkw

Enclosure

cc: Laura LaPierre, Program Manager, DEC Wetlands Program  
Laura Woods, Environmental Technician, DEC Wetlands Program  
Michael Adams, Senior Project Engineer, U.S. Army Corps of Engineers  
Andy Thomas, BDE Grand Isle Solar, LLC

# Vermont Wetlands Program Permit Application Database Form

Under Sections 8 and 9  
of the Vermont Wetland Rules



Application Submittal Instructions
<ul style="list-style-type: none"> <li>■ If submitting via US post, include a check in the correct fee amount made payable to the <b>“State of Vermont,”</b> and a CD for applications that contain large files (1 MB or greater).  <div style="margin-left: 40px;"> <b>Mail to:</b> Vermont Wetlands Program                      Watershed Management Division                      One National Life Drive, Main 2                      Montpelier, VT 05620-3522                 </div> </li>   <li>■ Applications can also be submitted via email to the following address: <a href="mailto:anr.wsmdwetlands@vermont.gov">anr.wsmdwetlands@vermont.gov</a> <ul style="list-style-type: none"> <li>■ If submitting via email, please mail a check in the correct fee amount, made payable to the <b>“State of Vermont,”</b> and a copy of the Vermont Wetlands Program Application Database Form (this page) to the address provided above. <b><i>It is not necessary to mail in a copy of the complete application.</i></b></li> </ul> </li> </ul>

<b>Applicant Name:</b>	<b>Application Preparer Name:</b>
<b>Town where project is located:</b>	<b>County:</b>
<b>Span#:</b>	<b>Vermont Wetlands Project (VWP)# if Known:</b>
<b>Project Location Description:</b> <i>911 street address or direction from nearest intersection</i>	
<b>Brief Project Summary:</b>	
<b>Application Type:</b> <input type="checkbox"/> Individual Permit (multiple wetlands) <input type="checkbox"/> After the Fact Permit <input type="checkbox"/> Wetland Determination <input type="checkbox"/> Individual Permit (single wetland) <input type="checkbox"/> General Permit Coverage Authorization <input type="checkbox"/> Permit Amendment: VWP Project # _____	
<b>Existing Land Use Type(s):</b> <i>(Check all that apply)</i> <input type="checkbox"/> Residential (single family) <input type="checkbox"/> Residential (subdivision) <input type="checkbox"/> Undeveloped <input type="checkbox"/> Agriculture <input type="checkbox"/> Transportation <input type="checkbox"/> Forestry <input type="checkbox"/> Parks/Rec/Trail <input type="checkbox"/> Institutional <input type="checkbox"/> Industrial/Commercial	
<b>Proposed Land Use Type(s):</b> <i>(Check all that apply)</i> <input type="checkbox"/> Residential (single family) <input type="checkbox"/> Residential (subdivision) <input type="checkbox"/> Undeveloped <input type="checkbox"/> Agriculture <input type="checkbox"/> Transportation <input type="checkbox"/> Forestry <input type="checkbox"/> Parks/Rec/Trail <input type="checkbox"/> Institutional <input type="checkbox"/> Industrial/Commercial	
<b>Proposed Impact Type(s):</b> <i>(Check all that apply)</i> <input type="checkbox"/> Buildings <input type="checkbox"/> Utilities <input type="checkbox"/> Parking <input type="checkbox"/> Septic/Well <input type="checkbox"/> Stormwater <input type="checkbox"/> Driveway <input type="checkbox"/> Park/Path <input type="checkbox"/> Agriculture <input type="checkbox"/> Pond <input type="checkbox"/> Lawn <input type="checkbox"/> Dry Hydrant <input type="checkbox"/> Beaver Dam Alteration <input type="checkbox"/> Silviculture <input type="checkbox"/> Road <input type="checkbox"/> Aesthetics <input type="checkbox"/> No Impact <input type="checkbox"/> Other: _____	
<b>Wetland and Buffer Impact Type:</b> <i>(Check all that apply)</i> <input type="checkbox"/> Dredge <input type="checkbox"/> Drain <input type="checkbox"/> Cut Vegetation <input type="checkbox"/> Stormwater <input type="checkbox"/> Trench/Fill <input type="checkbox"/> Other: _____	
<b>Wetland Delineation Date(s):</b>	

Wetland Improvements	Buffer Zone Improvements	Reason for Improvements
Restoration: s.f.	Restoration: s.f.	<input type="checkbox"/> Correction of Violation
Creation: s.f.	Creation: s.f.	<input type="checkbox"/> To offset permit impacts
Enhancement: s.f.	Enhancement: s.f.	<input type="checkbox"/> Voluntary
Conservation: s.f.	Conservation: s.f.	

<b>Wetland Impact Fee Calculations: Round to the nearest square foot. Fees will auto-calculate.</b>			
Total Wetland Impact <i>(minus linear clear, including ATF)</i>	square feet (s.f.)	Wetland Impact Fee: (\$0.75/sf)	\$
Total Wetland Clearing <i>(qualified linear projects only)</i>	square feet (s.f.)	Wetland Clearing Fee: (\$0.25/sf)	\$
After The Fact Wetland Impact <i>(to correct a violation)</i>	square feet (s.f.)	After the Fact Wetland Fee: (0.75/sf) <i>(Required for after the fact permit applications)</i>	\$
<b>Total Buffer Zone Impacts and Calculations: Round to the nearest square foot</b>			
Total Buffer Zone Impact	square feet (s.f.)	Buffer Impact Fee: (\$0.25/sf)	\$

Additional Fees	
	Agricultural Crop Conversion <i>Check here:</i> <i>(Flat fee of \$200.00)</i> \$
	Minimum Application Fee: (\$50.00) <i>Required when total impact fee is less than \$50.00</i> \$
	Administrative Fee: \$

<b>Make Checks Payable to: State of Vermont</b>	<b>Total Check Amount:</b>	<b>\$</b>
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**Vermont Individual Wetland  
Permit Application and  
Determination Petition**  
Under Sections 8 and 9  
of the Vermont Wetland Rules



VERMONT DEPARTMENT OF  
ENVIRONMENTAL CONSERVATION  
**WATERSHED  
MANAGEMENT DIVISION**  
WETLANDS PROGRAM

<b>Applicant Information:</b> <i>If the applicant is someone other than the landowner, the landowner information must be included below</i>			
Applicant Name: BDE Grand Isle Solar, LLC ("BDE"); c/o Andrew Thomas			
Address: 145 Pine Haven Shores Road Suite 1150		City/Town: Shelburne	State: VT
Phone Number: (802) 999-3377	Email Address: andy@bullrockcorp.com		
Zip: 05482			
<b>Applicant Certification:</b> By signing this application you are certifying that all of the information contained within is true, accurate, and complete to the best of your knowledge. Original signature is required.			
Applicant Signature: <u>Andrew Thomas</u>		Date: <u>10/11/2016</u>	

<b>Landowner Information:</b> <i>Landowner must sign the application. If landowner is different from the applicant this section must be filled out</i>			
<input type="checkbox"/> Check this box if landowner is the same as the applicant			
Landowner Name: Peter J. Johnson and Jocelyn J. Dubuque			
Address: 108 Allen Road		City/Town: Grand Isle	State: Vermont
Phone Number: (802) 233-1969	Email Address:		
Zip: 05458			
Landowner Easement: <i>Attach copies of any easements, agreements, or other documents conveying permission, and agreement with the landowner stating who will be responsible for meeting the terms and conditions of the permit. List the attachment for this information in this section. Describe the nature of the agreement or easement in the space provided below:</i>			
Lease agreement dated: 11/02/2015.			
<b>Landowner Certification:</b> By signing this application you are certifying that all the information contained within is true, accurate, and complete to the best of your knowledge. Original signature is required.			
Landowner Signature: <u>Peter Johnson and Jocelyn Dubuque</u>		Date: <u>10/11/2016</u>	

<b>Application Preparer Information:</b> <i>Consultant, engineer, or other representative that is responsible for filling out the application, if other than the applicant or landowner.</i>			
Application Preparer Name: VHB (Adam Cray)		Organization/Company: VHB	
Address: 40 IDX Drive, Buidling 100		City/Town: South Burlington	State: VT
Phone Number: 802-497-6100	Email Address: acray@vhb.com		
Zip: 05403			
<b>Application Preparer Certification:</b> By signing this application you are certifying that all of the information contained within is true, accurate, and complete to the best of your knowledge. Original signature is required.			
Application Preparer Signature: <u>Adam Cray</u>		Date: <u>10/17/16</u>	

*Handwritten signatures are also accepted*

**Vermont Individual Wetland  
Permit Application and  
Determination Petition**  
Under Sections 8 and 9  
of the Vermont Wetland Rules



<b>Applicant Information:</b> <i>If the applicant is someone other than the landowner, the landowner information must be included below</i>			
Applicant Name: _____			
Address: _____	City/Town: _____	State: _____	Zip: _____
Phone Number: _____	Email Address: _____		
<b>Applicant Certification:</b> By signing this application you are certifying that all of the information contained within is true, accurate, and complete to the best of your knowledge. Original signature is required.			
Applicant Signature: _____		Date: _____	

<b>Landowner Information:</b> <i>Landowner must sign the application. If landowner is different from the applicant this section must be filled out</i>			
<input type="checkbox"/> <b>Check this box if landowner is the same as the applicant</b>			
Landowner Name: _____			
Address: _____	City/Town: _____	State: _____	Zip: _____
Phone Number: _____	Email Address: _____		
Landowner Easement: <i>Attach copies of any easements, agreements, or other documents conveying permission, and agreement with the landowner stating who will be responsible for meeting the terms and conditions of the permit. List the attachment for this information in this section. Describe the nature of the agreement or easement in the space provided below:</i>			
<b>Landowner Certification:</b> By signing this application you are certifying that all the information contained within is true, accurate, and complete to the best of your knowledge. Original signature is required.			
Landowner Signature: _____		Date: _____	

<b>Application Preparer Information:</b> <i>Consultant, engineer, or other representative that is responsible for filling out the application, if other than the applicant or landowner.</i>			
Application Preparer Name: _____		Organization/Company: _____	
Address: _____	City/Town: _____	State: _____	Zip: _____
Phone Number: _____	Email Address: _____		
<b>Application Preparer Certification:</b> By signing this application you are certifying that all of the information contained within is true, accurate, and complete to the best of your knowledge. Original signature is required.			
Application Preparer Signature: _____		Date: _____	

*Handwritten signatures are also accepted*

**1. Location of wetland and project:**  
*Location description should include the road the wetland is located on, the compass direction of the wetland in relation to the road, 911 street address if available, and any other distinguishing features.*

**2. Site visit date(s) and attendees:**  
*A site visit is **required** before the application can be called complete*

2.1 Date of Visit(s) with State District Wetland Ecologist	2.2. List of people present for site visit(s) including Ecologist, landowner, and representatives.

**3. Wetland Classification:**  
*For multiple wetlands fill out the multiple wetlands table for sections 1 and 3 through 1*

**3.1. The wetland is a Class II wetland because :**

**3.2. Section 4.6 Presumption**  
*If the wetland meets the Section 4.6 Presumption, it does so primarily because:*

**4. Description of the Entire Wetland:**  
*Answer the following questions regarding the entire wetland, which includes all wetland areas connected to the wetland proposed for impact. Answers may be estimates based on desktop review when the wetland extends past the investigation area (parcel boundary). Specific questions about the wetland in the project area will follow. For multiple wetlands , fill out the multiple wetlands table.*

**4.1. Size of Complex in Acres:**  
*The size of the complex can be obtained from the Wetland Inventory Map for mapped wetlands, or best estimation based on review of aerial photography or site visit. This is not the size of the of the delineated wetland on the subject property unless the entirety of the wetland is represented in the delineation.*

**4.2. Vegetation Cover Types Present:**  
*List all wetland types in the wetland or wetland complex and their percent cover.  
**For example:** 50 acres of softwood forested swamp; or 30% scrub swamp, 70% emergent wetland*

**4.3. Landscape Position:**  
*Where is the wetland located on the landscape?  
**For example:** Bottom of a basin, edge of a stream, shore of a lake, etc.*

**4.4. Hydrology:**  
*Describe the main source of water for the entire wetland. List any river, stream, lakes, or ponds*

**4.4.1. Direction of Flow:**  
***For example:** Stream flows from north to south through the wetland complex, or the wetland drains generally to the southwest.*

**4.4.2. Influence of Hydrology on the Entire Wetland:**  
***For example:** The river provides floodwater to the wetland in the spring.*

**4.4.3. Relation of Entire Wetland to the Project Area:**  
*The distance between the project area and any nearby surface waters*

<p><b>4.4.4. Entire Wetland Hydroperiod:</b>  <i>Discuss the frequency and duration of flooding, ponding, and/or soil saturation</i></p>
<p><b>4.5. Surrounding Landuse of the Entire Wetland:</b>  <i>For example: Rural residential and forested; Agricultural and undeveloped</i></p>
<p><b>4.6. Relation of the Entire Wetland to Other Nearby Wetlands:</b>  <i>Provide any information on wetlands or wetland complexes that are close enough to contribute to the overall function of the wetland in question.</i></p>
<p><b>4.7. Pre-project Cumulative Impacts to the Entire Wetland:</b>  <i>Identify any cumulative ongoing impacts outside of the proposed project that may influence the wetland. <b>Examples include but are not limited to:</b> Wetland encroachments on and off the subject property, land use management in or surrounding the wetland, or development that influences hydrology or water quality. List any past Vermont Wetland Permits or CUD's related to this property.</i></p>
<p><b>5. Description of Subject Wetland and Buffer:</b>  <i>Subject wetland is defined as the area of wetland in the project vicinity, but not limited to the portion of the wetland to be directly impacted by the project. For the purposes of this application, the subject wetland should encompass any portion of the wetland that could either be directly or indirectly impacted by the project, as defined by chemical, physical, or biological characteristics. This may include the entire wetland area, or wetland area off property. For multiple wetlands, fill out the multiple wetlands table.</i></p>
<p><b>5.1. Context of Subject Wetland:</b>  <i>Describe where the subject wetland is in the context of the entire wetland described in section 4 above. <b>For example:</b> Upslope, narrow eastern "finger", 400 ft. from open water portion.</i></p>
<p><b>5.2. Subject Wetland Land Use:</b>  <i><b>For example:</b> Mowed lawn, old field, naturally vegetated. Describe any previous and ongoing disturbance in the subject wetland.</i></p>
<p><b>5.3. Subject Wetland Vegetation:</b>  <i>List dominant wetland vegetation cover type and associated dominant plant species.</i></p>
<p><b>5.4. Subject Wetland Soils:</b>  <i>Use the USDA NRCS information where possible and use the ACOE Delineation Manual soil description</i></p>
<p><b>5.5. Subject Wetland Hydrology:</b>  <i>Use the description from the ACOE Delineation Manual</i></p>

<b>5.6. Buffer Zone:</b> <i>Describe the buffer zone of the subject wetland (50 foot envelope of land adjacent to wetland boundary).</i>
<b>5.6.1. Buffer Land Use:</b> <i><b>For example:</b> Mowed shoulder, forested, old field, paved road, and residential lawns, etc.                  Describe any previous and ongoing disturbance in the buffer zone.</i>
<b>5.6.2. Buffer Vegetation:</b> <i>List the vegetation cover type and dominant plant species.</i>
<b>5.6.3. Buffer Soils:</b> <i>Use USDA NRCS information where possible, and the ACOE Delineation Manual soil description.</i>

<b>6. Entire Wetland Function and Value Summary (as defined in the Vermont Wetland Rules Section 5):</b> <i>Check which functions are present in the entire wetland</i>	
<input type="checkbox"/> Flood/Storm Storage	<input type="checkbox"/> RTE Species
<input type="checkbox"/> Surface & Groundwater Protection	<input type="checkbox"/> Education & Research
<input type="checkbox"/> Fish Habitat	<input type="checkbox"/> Recreation/Economic
<input type="checkbox"/> Wildlife Habitat	<input type="checkbox"/> Open Space/Aesthetics
<input type="checkbox"/> Exemplary Natural Community	<input type="checkbox"/> Erosion Control

<p><b>Functions and Values:</b> <i>For each function and value:</i></p> <ol style="list-style-type: none"> <li>1. <i>Evaluate the entire wetland and check all that apply. Use Wetland Inventory Maps for offsite areas</i></li> <li>2. <i>Evaluate how the wetland in the project area contributes to the function.</i></li> <li>3. <i>Explain how the project will not result in adverse impacts to the function.</i></li> </ol> <p><i>Include any information on specific avoidance and minimization measures.</i></p> <p><i>If more than one wetland complex is involved, provide a function and value checklist for each wetland complex. In addition fill out the Multiple Wetlands Table.</i></p>
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<b>7. Water Storage for Flood Water and Storm Runoff</b>
<p><input type="checkbox"/> Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Constricted outlet or no outlet and an unconstructed inlet.</li> <li><input type="checkbox"/> Physical space for floodwater expansion and dense, persistent, emergent vegetation or dense woody vegetation that slows down flood waters or stormwater runoff during peak flows and facilitates water removal by evaporation and transpiration.</li> <li><input type="checkbox"/> If a stream is present, it's course is sinuous and there is sufficient woody vegetation to intercept surface flows in the portion of the wetland that floods.</li> <li><input type="checkbox"/> Physical evidence of seasonal flooding or ponding such as water stained leaves, water marks on trees, drift rows, debris deposits, or standing water.</li> <li><input type="checkbox"/> Hydrologic or hydraulic study indicates wetland attenuates flooding</li> </ul> <p><b>If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level. If none of the following apply, the wetland provides this function at a moderate level.</b></p>



**Water Storage for Flood Water and Storm Runoff Continued...**

Check this box if any of the following conditions apply that may indicate the wetland provides this function at a **lower** level.

- Significant flood storage capacity upstream of the wetland, and the wetland in question provides this function at a negligible level in comparison to upstream storage (unless the upstream storage is temporary such as a beaver impoundment).
- Wetland is contiguous to a major lake or pond that provides storage benefits independently of the wetland.
- Wetland's storage capacity is created primarily by recent beaver dams or other temporary structures.
- Wetland is very small in size, not contiguous to a stream, and not part of a collection of small wetlands in the landscape that provide this function cumulatively.

Check this box if any of the following conditions apply that may indicate the wetland provides this function at a **higher** level.

- History of downstream flood damage to public or private property.
- Any of the following conditions present downstream of the wetland, but upstream of a major lake or pond, could be impacted by loss or reduction of the water storage function.
  - Developed public or private property
  - Stream banks susceptible to scouring and erosion
  - Important habitat for aquatic life
- The wetland is large in size and naturally vegetated.
- Any of the following conditions present downstream of the wetland, but upstream of a major lake or pond, could be impacted by a loss or reduction of the water storage function.
  - Developed public or private property.
  - Stream banks susceptible to scouring and erosion.
  - Important habitat for aquatic life.
- The wetland is large in size and naturally vegetated
- Any of the following conditions present upstream of the wetland may indicate a large volume of runoff may reach the wetland.
  - A large amount of impervious surface in urbanized areas.
  - Relatively impervious soils.
  - Steep slopes in the adjacent areas.

**7.1 Subject Wetland Contribution to Water Storage:**

*Explain how the subject wetland contributes to the function listed above*

**7.2 Statement of No Undue Adverse Impact to Water Storage for Flood Water and Storm Runoff:**

*Explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance, minimization, and compensation measures relevant to this function.*

**8. Surface and Ground Water Protection:**

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
- Constricted or no outlets.
  - Low water velocity through dense, persistent vegetation.
  - Hydroperiod permanently flooded or saturated.
  - Wetlands in depositional environments with persistent vegetation wider than 20 feet.
  - Wetlands with persistent vegetation comprising a defined delta, island, bar or peninsula.
  - Presence of seeps or springs.
  - Wetland contains a high amount of microtopography that helps slow and filter surface water.
  - Position in the landscape indicates the wetland is a headwaters area.
  - Wetland is adjacent to surface waters.
  - Wetland recharges a drinking water source.
  - Water sampling indicates removal of pollutants or nutrients.
  - Water sampling indicates retention of sediments or organic matter.
  - Fine mineral soils and alkalinity not low.
  - The wetland provides an obvious filter between surface water or ground water and land uses that may contribute point or nonpoint sources of sediments, toxic substances or nutrients to the wetland, such as: steep erodible slopes; row crops; dumps; areas of pesticide, herbicide or fertilizer application; feed lots; parking lots or heavily traveled road; and septic systems.

**If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level. If none of the following apply, the wetland provides this function at a moderate level.**

- Check this box if any of the following conditions apply that may indicate the wetland provides function at a **lower** level.
- Presence of dead forest or shrub areas in sufficient amounts to result in diminished nutrient uptake.
  - Presence of ditches or channels that confine water and restrict contact of water with vegetation.
  - Wetland is very small in size, not contiguous to a stream, and not part of a collection of small wetlands in the landscape that provide this function cumulatively.
  - Current use in the wetland results in disturbance that compromises this function.
- Check this box if any of the following conditions apply that may indicate the wetland provides function at a **higher** level.
- The wetland is adjacent to a well head or source protection area, and provides ground water recharge.
  - The wetland provides flows to Class A surface water. (Check ANR Atlas)
  - The wetland contributes to the protection or improvement of water quality of any impaired waters.
  - The wetland is large in size and naturally vegetated.

**8.1. Subject Wetland Contribution to Water Protection:**

*Explain how the subject wetland contributes to the function listed above.*

**8.2. Statement of No Undue Adverse Impact to Surface and Ground Water Protection:**

*Explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance, minimization, or compensation measures relevant to this function.*

**9. Fish Habitat:**

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
  - Contains woody vegetation that overhangs the banks of a stream or river and provides any of the following: shading that controls summer water temperature; cover including refuges created by overhanging branches or undercut banks; source of terrestrial insects as fish food; or streambank stability.
  - Provides spawning, nursery, feeding or cover habitat for fish (documented or professionally judged). Common habitat includes deep marsh and shallow marsh associates with lakes and streams, and seasonally flooded wetlands associated with streams and rivers.
  - Documented or professionally judged spawning habitat for northern pike.
  - Provides cold spring discharge that lowers the temperature of receiving waters and creates summer habitat for salmonoid species.
  - The wetland is located along a tributary that does not support fish, but contributes to a larger body of water that does support fish. The tributary supports downstream fish by providing cooler water and food sources.

**9.1. Subject Wetland Contribution to Fish Habitat:**

*Explain how the subject wetland contributes to the function listed above.*

**9.2. Statement of No Undue Adverse Impact to Fish Habitat:**

*Explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance, minimization, or compensation measures relevant to this function.*

**10. Wildlife Habitat**

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
- Provides resting, feeding staging or roosting habitat to support waterfowl migration, and feeding habitat for wading birds. Good habitats for these species include open water wetlands.
  - Habitat to support one or more breeding pairs or broods of waterfowl including all species of ducks, geese, and swans. Good habitats for these species include open water habitats adjacent shallow marsh, deep marsh, shrub wetland, forested wetland, or naturally vegetated buffer zone.
  - Provides a nest site, a buffer for a nest site or feeding habitat for wading birds including but not limited to: great blue heron, black-crowned night heron, green-backed heron, cattle egret, or snowy egret. Good habitats for these species include open water or deep marsh adjacent to forested wetlands, or standing dead trees.
  - Supports or has the habitat to support one or more breeding pairs of any migratory bird that requires wetland habitat for breeding, nesting, rearing of young, feeding, staging roosting, or migration, including: Virginia rail, common snipe, marsh wren, American bittern, northern water thrush, northern harrier, spruce grouse, Cerulean warbler, and common loon.
  - Supports winter habitat for white-tailed deer. Good habitats for this species include softwood swamps. Evidence of use includes browsing, bark stripping, worn trails, or pellet piles.
  - Provides important feeding habitat for black bear, bobcat, or moose based on an assessment of use. Good habitat for these types of species includes wetlands located in a forested mosaic.
  - Has the habitat to support muskrat, otter, or mink. Good habitats for these species include deep marshes, wetlands adjacent to bodies of water including lakes, ponds, rivers, and streams.
  - Supports an active beaver dam, one or more lodges, or evidence of use in two or more consecutive years by an adult beaver population.
  - Provides the following habitats that support the reproduction of uncommon Vermont amphibian species including:
    - Wood frog, Jefferson salamander, blue-spotted salamander, or spotted salamander. Breeding habitat for these species includes vernal pools and small ponds.
    - Northern dusky salamander and the spring salamander. Habitat for these species includes headwater seeps, springs, and streams.
    - The four-toed salamander, Fowler's toad, western or boreal chorus frog, or other amphibians, found in Vermont of similar significance.
  - Supports or has the habitat to support populations of Vermont amphibian species including, but not limited to, pickerel frog, northern leopard frog, mink frog, and others found in Vermont of similar significance. Good habitat for these types of species include large marsh systems with open water components.
  - Supports or has the habitat to support populations of uncommon Vermont reptile species including: wood turtle, northern map turtle, eastern musk turtle, spotted turtle, spiny softshell, eastern ribbonsnake, northern watersnake, and others found in Vermont of similar significance.
  - Supports or has the habitat to support significant populations of Vermont reptile species, including smooth greensnake, DeKay's brownsnake, or other more common wetland-associated species.
  - Meets four or more of the following conditions indicative of wildlife habitat diversity:
    - Three or more wetland vegetation classes (greater than 1/2 acre) present including but not

**Wildlife Habitat Continued...**

limited to: open water contiguous to, but not necessarily part of, the wetland, deep marsh, shallow marsh, shrub swamp, forested swamp, fen, or bog.

- The dominant vegetation class is one of the following types: deep marsh, shallow marsh, shrub swamp or, forested swamp.
- Located adjacent to a lake, pond, river or stream.
- Fifty percent or more of surrounding habitat type is one or more of the following: forest, agricultural land, old field or open land.
- Emergent or woody vegetation occupies 26 to 75 percent of wetland, the rest is open water.
- One of the following:
  - Hydrologically connected to other wetlands of different dominant classes or open water within 1 mile.
  - Hydrologically connected to other wetlands of same dominant class within 1/2 mile.
  - Within 1/4 mile of other wetlands of different dominant classes or open water, but not hydrologically connected.

Wetland or wetland complex is owned in whole or in part by state or federal government and managed for wildlife and habitat conservation.

Contains evidence that it is used by wetland dependent wildlife species

**If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level. If none of the following apply, the wetland provides this function at a moderate level.**

Check box if any of the following conditions apply that may indicate the wetland provides this function at a **lower** level.

- The wetland is small in size for its type and does not represent fugitive habitat in developed areas (vernal pools and seeps are generally small in size, so this does not apply).
- The surrounding land use is densely developed enough to limit use by wildlife species (with the exception of wetlands with open water habitat). Can be negated by evidence of use.
- The current use in the wetland results in frequent cutting, mowing or other disturbance.
- The wetland hydrology and character is at a drier end of the scale and does not support wetland dependent species.

Check box if any of the following conditions apply that may indicate the wetland provides this function at a **higher** level.

- The wetland is large in size and high in quality.
- The habitat has the potential to support several species based on the assessment above.
- Wetland is associated with an important wildlife corridor.
- The wetland has been identified as a locally important wildlife habitat by an ANR Wildlife Biologist.

**10.1. Subject Wetland Contribution to Wildlife Habitat Functions:**

*Explain how the subject wetland contributes to the function listed above.*

**10.2. Statement of No Undue Adverse Impact to Wildlife Habitat:**

*Explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance, minimization, or compensation measures relevant to this function.*

**11. Exemplary Wetland Natural Community**

Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.

Wetlands that are identified as high quality examples of Vermont's natural community types recognized by the Natural Heritage Information Project of the Vermont Fish and Wildlife Department, including rare types such as dwarf shrub bogs, rich fens, alpine peatlands, red maple-black gum swamps and the more common types including deep bulrush marshes, cattail marshes, northern white cedar swamps, spruce-fir-tamarack swamps, and red maple-black ash seepage swamps are automatically significant for this function

**The wetland is also likely to be significant if any of the following conditions are met:**

Is an example of a wetland natural community type that has been identified and mapped by, or meets the ranking and mapping standards of, the Natural Heritage Information Project of the Vermont Fish and Wildlife Department.

Contains ecological features that contribute to Vermont's natural heritage, including, but not limited to:

- Deep peat accumulation reflecting a long history of wetland formation;
- Forested wetlands displaying very old trees and other old growth characteristics;
- A wetland natural community that is at the edge of the normal range for that type;
- A wetland mosaic containing examples of several to many wetland community types; or
- A large wetland complex containing examples of several wetland community types.

**List species or communities of concern:**

**11.1. Subject Wetland Proximity to Exemplary Natural Communities**

**11.2. Statement of No Undue Adverse Impact to Exemplary Wetland Natural Community:**

*Explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance, minimization, or compensation measures relevant to this function.*

**12. Rare, Threatened, and Endangered Species Habitat:**

Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.

Wetlands that contain one or more species on the federal or state threatened or endangered lists, as well as species that are rare in Vermont, are automatically significant for this function.

**The wetland is also likely to be significant if any of the following apply:**

There is credible documentation that the wetland provides important habitat for any species on the federal or state threatened or endangered species lists;

There is credible documentation that threatened or endangered species have been present in past 10 years;

There is credible documentation that the wetland provides important habitat for any species listed as rare in Vermont (S1 or S2 ranks), state historic (SH rank), or rare to uncommon globally (G1, G2, or G3 ranks) by the Natural Heritage Information Project of the Vermont Fish and Wildlife Department;

There is credible documentation that the wetland provides habitat for multiple uncommon species of plants or animals (S3 rank).

**List name of species and ranking:**

**12.1. Subject Wetland Contribution to RTE Habitat:**

*Explain how the subject wetland contributes to the function listed above.*

**12.2 Statement of No Undue Adverse Impact to Rare, Threatened, or Endangered Species Habitat:**

*Explain how the proposed project will not result in any undue, adverse impact to this function. Include any avoidance, minimization, or compensation measures relevant to this function.*

**13. Education and Research in Natural Sciences:**

- Function is present and likely to be significant: Any of the following characteristics indicate the wetland provides this function.
  - Owned by or leased to a public entity dedicated to education or research.
  - History of use for education or research.
  - Has one or more characteristics making it valuable for education or research.

**13.1. Subject Wetland Education and Research Potential:**

*Explain how the subject wetland contributes to the function listed above.*

**13.2 Statement of No Undue Adverse Impact to Education and Research in Natural Sciences:**

*Explain how the proposed project will not result in any undue, adverse impact to this value. Include any avoidance, minimization, or compensation measures relevant to this value.*

**14. Recreational Value and Economic Benefits:**

- Function is present and likely to be significant: Any of the following characteristics indicate the wetland provides this function.
  - Used for, or contributes to, recreational activities.
  - Provides economic benefits.
  - Provides important habitat for fish or wildlife which can be fished, hunted or trapped under applicable state law.
  - Used for harvesting of wild foods.

**Comments:**

**14.1. Subject Wetland Recreational and Economic Value:**

*Explain how the subject wetland contributes to the value listed above.*

**14.2. Statement of No Undue Adverse Impact to Recreational Value and Economic Benefits:**

*Explain how the proposed project will not result in any undue, adverse impact to this value. Include any avoidance, minimization, or compensation measures relevant to this value.*



**15. Open Space and Aesthetics:**

Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.

- Can be readily observed by the public; and
  - Possesses special or unique aesthetic qualities; or
  - Has prominence as a distinct feature in the surrounding landscape;
- Has been identified as important open space in a municipal, regional or state plan.

**Comments:**

**15.1. Subject Wetland Aesthetic Value:**

*Explain how the subject wetland contributes to the value listed above.*

**15.2. Statement of No Undue Adverse Impact to Open Space and Aesthetics:**

*Explain how the proposed project will not result in any undue, adverse impact to this value. Include any avoidance, minimization, or compensation measures relevant to this value.*

**16. Erosion Control Through Binding and Stabilizing**

Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.

- Erosive forces such as wave or current energy are present and any of the following are present as well:
  - Dense, persistent vegetation along a shoreline or stream bank that reduces an adjacent erosive force.
  - Good interspersion of persistent emergent vegetation and water along course of water flow.
  - Studies show that wetlands of similar size, vegetation type, and hydrology are important for erosion control.

**What type of erosive forces are present?**

- Lake fetch and waves
- High current velocities:
- Water level influenced by upstream impoundment

**Erosion Control Through Binding and Stabilization Continued...**

**If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level. If none of the following apply, the wetland provides this function at a moderate level.**

Check box if any of the following conditions apply that may indicate the wetland provides this function at a lower level.

The stream is artificially channelized and/or lacks vegetation that contributes to controlling the erosive force.

Check box if any of the following conditions apply that may indicate the wetland provides this function at a higher level.

The stream contains high sinuosity.

Has been identified through fluvial geomorphic assessment to be important in maintaining the natural condition of the stream or river corridor.

**16.1. Subject Wetland Contribution to Erosion Control:**

*Explain how the subject wetland contributes to the function listed above.*

**16.2. Statement of No Undue Adverse Impact to Erosion Control:**

*Explain how the proposed project will not result in any undue, adverse impact to this function. include any avoidance, minimization, or compensation measures relevant to this function.*

**17. Project Description:**

**17.1. Overall Project Purpose:**

*Description of the basic project and why it is needed. Partial projects with no clear purpose will not be accepted.*

**For example:** six-lot residential subdivision; expansion of an existing commercial building, building a single family residence.

**17.2. Description of Project Component Impacting Wetland or Buffer:**

*Explain in general terms which portions of the project will impact wetlands or buffer zones.*

**For example:** Cross the wetland with a driveway to construct a residential subdivision, upgrade existing road through buffer to improve access, extend a trail system.

<b>17.3. Acreage of Parcel(s) or Easements(s):</b> <i>Acreage of subject property.</i>
<b>17.4. Acreage of Project Area:</b> <i>Acreage of area involved in the project.</i>

<b>18. Project Details:</b> <i>Provide details regarding specific impacts to the wetland and buffer zone.</i>  <b><i>For multiple wetlands fill out the multiple wetland table.</i></b>
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<b>18.1. Specific Impacts to Wetland and Buffer Zone Dimensions:</b> <i>List portions of the project that will specifically impact the wetland or buffer zone and their dimensions. <b>For example:</b> driveway crossing with 16' wide fill; installation of buried sewer force main with 5' trench including fill footprint; addition of Stormwater outfall which directs flow to northern portion of wetland</i>
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<b>18.2. Bridges and Culverts:</b> <i>Culvert circumference, length, placement and shapes, or bridge details. List any stream alteration permits that are required or obtained where perennial streams or rivers are involved.</i>
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<b>18.3. Construction Sequence:</b> <i>Describe any details pertaining to the work planned in the wetland and buffer in terms of sequence or phasing that is relevant. Describe the construction limits of disturbance, how those will be marked, and check to ensure these are shown on the site plans as well.</i>
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<b>18.4. Stormwater Design**</b> <i>List any stormwater permits obtained or applied for. Describe stormwater and/or erosion controls proposed. <b>** Erosion prevention is <u>required</u> in order to prevent sediment from entering the wetland.</b></i>
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<b>18.5. Permanent Demarcation of Limit of Impacts**</b> <i>Describe any boulders, fencing, signage, or other memorialization that provides permanent on-the-ground boundaries for the limits of disturbance for ongoing uses. <b>**Permanent demarcations are <u>required</u> for projects with ongoing activities in or near wetlands or buffer zones such as houses, yards, woody clearing or parking areas, and needs to be depicted on the site plans.</b></i>
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**19. Wetland and Buffer Zone Impacts:**

*For multiple wetlands provide narrative overview for each section below, and fill out the Multiple Wetland Tables*

**19.1. Wetland Impacts:**

*Summarize the square footage of impact in the appropriate category. Add After-the-Fact impacts here too. **Round to the nearest square foot***

Permanent Wetland Fill	s.f.
Temporary Wetland Impact	s.f.
Other Permanent Wetland Impact <i>(this number includes clearing of woody vegetation, dredging, and does not include fill)</i>	s.f.
Total Wetland Impact:	s.f.

*Describe in detail the proposed impact to wetlands*

**For example:** Fill for road crossing, temporary impacts for trench and fill related to utility installation.

**General narrative required here even for projects with multiple wetlands and impacts**

**19.2. Buffer Zone Impacts:**

*Summarize the square footage of impact in the appropriate category.*

Temporary Buffer Impact	s.f.
Permanent Buffer Impact	s.f.
Total Buffer Impact:	s.f.

*Describe in detail the proposed impact to buffer zones*

**For example:** Addition of fill along roadway embankment extending into buffer zone.

**General narrative required here even for projects with multiple wetlands and impacts.**

**19.3. Cumulative Impacts:**

*List any potential cumulative or ongoing, direct and indirect impacts on the functions of the wetland.*

**For example:** Increased noise from parking lot, vegetation management, inputs from stormwater pond outlet, reduction in flood storage volume from the addition of fill from the project.

**20. Mitigation Sequence:**

*Before you begin, please read all of Section 20 to respond most appropriately to specific questions. Questions specifically related to Section 9.5b of the Vermont Wetland Rules.*

**20.1. Avoidance of Wetland Impacts:**

**20.1.1. Can the activity be located on another site owned or controlled by the applicant, or reasonably available to satisfy the basic project purpose? If not, indicate why. Cite any alternative sites and explain why they were not chosen.**

**20.1.2. Can the proposed activity be practicably located outside the wetland/buffer zone? If not, indicate why. Explain the alternatives you have explored for avoiding the wetland and buffer onsite, And why they are not feasible.**

**20.2. Avoidance to the Impact to Functions and Values:**

**20.2.1. If the proposed activity cannot be practicably located outside the wetland/buffer zone, have all practicable measures been taken to avoid adverse impacts on protected functions?  Yes  No**

**20.2.2. What design alternatives were examined to avoid impacts to wetland function? *For example: Use of matting, relocation of footprint, etc.***

**20.2.3. What steps have been taken to minimize the size and scope of the project to avoid impacts to wetland functions and values? Include information on project size reduction and relocation.**

**20.2.4. Explain how the proposed project represents the least impact alternative design. Explain why other alternatives, which you described above, were not chosen.**

**20.3. Minimization and Restoration:**

**20.3.1. If avoidance of adverse effects on protected functions cannot be practically achieved, has the proposed activity been planned to minimize adverse impacts on the protected function?  Yes  No  N/A**

**20.3.2. What measures will be used during construction and on an ongoing basis to protect the wetland and buffer zone? *For example: Stormwater treatment, signs, fencing, etc.***

**Minimization and Restoration Continued...**

**20.3.3. Has a plan been developed for the prompt restoration of any adverse impacts on protected functions?**  Yes  No  N/A

**Restoration Narrative:**

*For example: Planting along the stream.*

**Quantification of Restoration:**

Wetland Area (sqft)	Buffer Area (sqft)	Functions/Value s Addressed

**20.4. Compensation:**

*Please refer to Section 9.5c of the Vermont Wetland Rules for compensation, which is required when the project will result in net adverse impact to wetland function. Not all functions are presumed to be compensable. **All projects requiring compensation need prior consultation with the Vermont Wetlands Program.***

*If compensation is proposed please include a summary here. Also list any supporting documents you may have attached to the application including In-Lieu-Fee proposal or detailed compensation plan.*

**21. Wetland Determination:**

*If the application involves a wetland determination please answer the following. For multiple wetlands provide narrative overview for each section below, and fill out the Multiple Wetland Tables.*

- Wetland is mapped or contiguous to the Vermont Significant Wetland Inventory Map
- Wetland is not mapped on or contiguous to the Vermont Significant Wetland Inventory Map

**21.1. Reason for Petition:**

*Please choose one from the dropdown menu.*

**21.2. Determination Narrative:**

*Please provide any narrative to support the petition for a wetland determination here, including previous decisions by the Secretary or Water Board.*





**23. Abutting Landowners**

Please provide abutting landowner information so that all persons owning property within, or adjacent to, the affected wetland area of buffer zone can be notified during the public notice period. **Please use additional sheets if necessary.**

**23.1. Abutting Land Owner Information:** Please list as first names first followed by last name

1. Name: Street/Road: City/State/Zip:	16. Name: Street/Road: City/State/Zip:
2. Name: Street/Road: City/State/Zip:	17. Name: Street/Road: City/State/Zip:
3. Name: Street/Road: City/State/Zip:	18. Name: Street/Road: City/State/Zip:
4. Name: Street/Road: City/State/Zip:	19. Name: Street/Road: City/State/Zip:
5. Name: Street/Road: City/State/Zip:	20. Name: Street/Road: City/State/Zip:
6. Name: Street/Road: City/State/Zip:	21. Name: Street/Road: City/State/Zip:
7. Name: Street/Road: City/State/Zip:	22. Name: Street/Road: City/State/Zip:
8. Name: Street/Road: City/State/Zip:	23. Name: Street/Road: City/State/Zip:
9. Name: Street/Road: City/State/Zip:	24. Name: Street/Road: City/State/Zip:
10. Name: Street/Road: City/State/Zip:	25. Name: Street/Road: City/State/Zip:
11. Name: Street/Road: City/State/Zip:	26. Name: Street/Road: City/State/Zip:
12. Name: Street/Road: City/State/Zip:	27. Name: Street/Road: City/State/Zip:
13. Name: Street/Road: City/State/Zip:	28. Name: Street/Road: City/State/Zip:
14. Name: Street/Road: City/State/Zip:	29. Name: Street/Road: City/State/Zip:
15. Name: Street/Road: City/State/Zip:	30. Name: Street/Road: City/State/Zip:

**24. Modified Distribution (Newspaper Notification):** In situations where there is an application within a large wetland or buffer zone that has a large number of landowners, applicants can choose to limit the distribution list with a supplemental newspaper notification. At a minimum the applicant must 1) provide notice to immediate abutters, 2) provide notice to all persons owning property containing the wetland or buffer within 500 ft. of the project area, and 3) shall have the VWP publish notice of the application in a local newspaper generally circulating in the area where the wetland is located. ***\*\*The applicant will be billed directly by the newspaper listed. Use of newspaper notification may extend the notice period, depending on when the notice posts in the newspaper\*\****

Name of Newspaper(s)


Impact Type	Proposed Impacts to Class II Wetland 2015-1 and Associated Buffer Zone		TOTAL (S.F.)	TOTAL (ACRES)
	Permanent Wetland Fill (S.F.)	Buffer Impacts (S.F.)		
Culvert Replacement	449	154	603	0.01
Perimeter Fence Posts	0	62	62	0.001
Access Road/Utility Interconnection	0	4,175	4,175	0.10
Select Tree Removal	0	23,958	23,958	0.55
<b>TOTAL (S.F.):</b>	<b>449</b>	<b>28,349</b>	<b>28,798</b>	<b>0.66</b>
<b>TOTAL (ACRES):</b>	<b>0.01</b>	<b>0.65</b>	<b>0.66</b>	<b>--</b>



PERMANENT CLASS II BUFFER IMPACT FROM PERIMETER FENCE POSTS: 62 S.F. (ROUNDED)  
[2,140 L.F. OF FENCE IN BUFFER: 1 POST (0.25 S.F./POST) / 10 L.F. + 33 CORNER POSTS = 247 POSTS]

CLASS II BUFFER IMPACT FROM SHADE MANAGEMENT TREE CUTTING: 23,958 S.F.

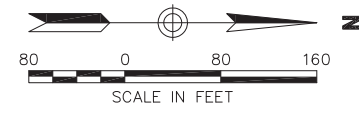
IN DESIGNATED WETLAND BUFFER AREA, SELECTIVE TREE TOPPING OF TREES OVER 40 FEET IN HEIGHT TO MAXIMUM FINAL HEIGHT OF APPROXIMATELY 40 FEET; PER APPROVED VEGETATION MANAGEMENT PLAN.

SELECTIVE TREE TOPPING OF TREES OVER 40 FEET IN HEIGHT; NOT SUBJECT TO VEGETATION MANAGEMENT PLAN.

CLASS II BUFFER IMPACT FROM NEW FILL FOR ACCESS ROAD IMPROVEMENTS/FUTURE DRIVEWAY INSTALL: 3,730 S.F.

CLASS II BUFFER IMPACT FROM UNDERGROUND INTERCONNECTION LINE INSTALLATION: 445 S.F.

PERMANENT IMPACT FROM CULVERT REPLACEMENT CLASS II WETLAND: 449 S.F. CLASS II BUFFER: 154



LEGEND	
	WETLAND
	50' WETLAND BUFFER
	STREAM CHANNEL
	ACCESS DRIVES
	STAGING AREA
	PROPERTY LINE
	OVERHEAD UTILITY
	UNDERGROUND UTILITY
	FENCE
	TREELINE
	TREES
	MINOR CONTOUR
	MAJOR CONTOUR
	PERMANENT CLASS II WETLAND IMPACT
	PERMANENT BUFFER IMPACT
	SELECT TREE REMOVAL (OTHER PERMANENT) BUFFER IMPACT
	PERIMETER FENCE BUFFER IMPACT (PERMANENT)

BDE Grand Isle Solar Project  
Grand Isle, Vermont

Class II Wetland and Buffer Impact Exhibit  
From 248 Site Filing Plan (Revised October 14, 2016)

May 26, 2016  
Revised: October 20, 2016

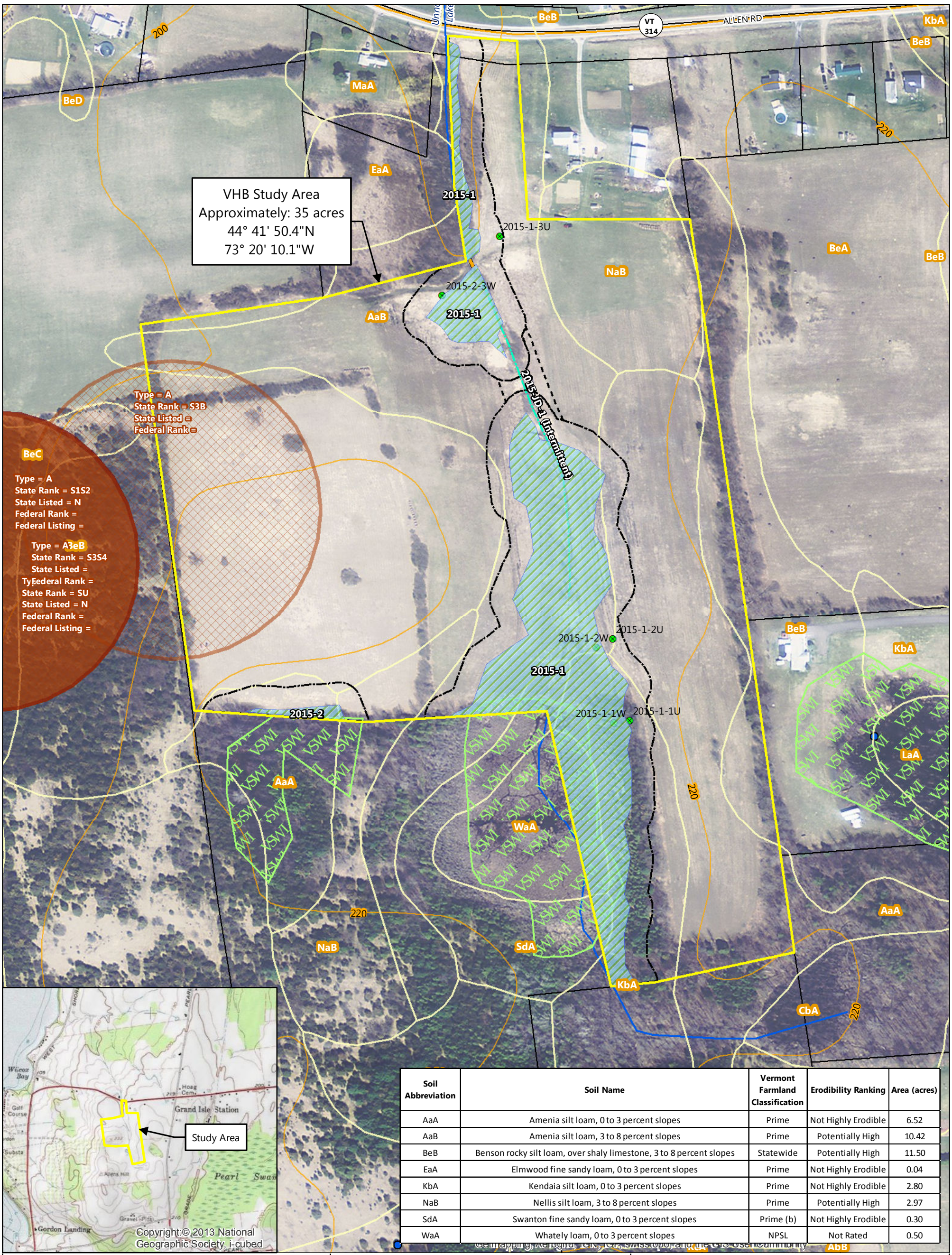
NOTE: Project will use approved BMPs to prevent unintended impacts to wetlands, buffers, and other sensitive natural resources, pre-construction demarcation of resources, EPSC measures during construction, and equipment cleaning, etc.

VHB Study Area  
 Approximately: 35 acres  
 44° 41' 50.4"N  
 73° 20' 10.1"W

Type = A  
 State Rank = S3B  
 State Listed =  
 Federal Rank =

BeC  
 Type = A  
 State Rank = S1S2  
 State Listed = N  
 Federal Rank =  
 Federal Listing =

Type = A3eB  
 State Rank = S3S4  
 State Listed =  
 Federal Rank =  
 Federal Listing =



Soil Abbreviation	Soil Name	Vermont Farmland Classification	Erodibility Ranking	Area (acres)
AaA	Amenia silt loam, 0 to 3 percent slopes	Prime	Not Highly Erodible	6.52
AaB	Amenia silt loam, 3 to 8 percent slopes	Prime	Potentially High	10.42
BeB	Benson rocky silt loam, over shaly limestone, 3 to 8 percent slopes	Statewide	Potentially High	11.50
EaA	Elmwood fine sandy loam, 0 to 3 percent slopes	Prime	Not Highly Erodible	0.04
KbA	Kendaia silt loam, 0 to 3 percent slopes	Prime	Not Highly Erodible	2.80
NaB	Nellis silt loam, 3 to 8 percent slopes	Prime	Potentially High	2.97
SdA	Swanton fine sandy loam, 0 to 3 percent slopes	Prime (b)	Not Highly Erodible	0.30
WaA	Whately loam, 0 to 3 percent slopes	NPSL	Not Rated	0.50

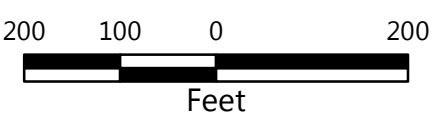
**Legend**

- Study Area (VHB)
- Class II Wetland (VHB)
- Jurisdictional Ditch (VHB)
- Class II Wetland Buffer (VHB)
- Riparian Buffer (VHB)
- Delineation Data Point (VHB)
- VSWI Wetland (ANR)
- Streams (VHD)
- Waterbody (VHD)\*
- NHI RTE Element Occurrences (VTFWD)
- NHI Uncommon Occurrences (VTFWD)
- Deer Wintering Area (VT ANR)\*
- NRCS Soils
- Ground Water Protection Area (VT ANR)\*
- Surface Water Protection Area (VT ANR)\*
- River Corridors (ANR)\*
- Parcel Boundary
- Private Wells (ANR)
- Public Wells (ANR)\*
- Interstate
- US Route
- Vermont State Highway
- Town Road
- 20 ft. Contours

\*Feature does not occur within map extent

## BDE Grand Isle Solar Project Grand Isle, VT Natural Resources Map

November 19, 2015



Sources: Background Orthophoto from VCGI (2014); NHI Element Occurrences, Surface Water Protection Area, Ground Water Protection Area, and Deer Wintering Area by ANR (2013-2015); River Corridors by ANR (2015); Contours from VCGI (2012); Streams and Waterbodies by VHD (2010); Soil Boundary by NRCS (2008); VSWI Wetlands by ANR (2014); Flood Zones by FEMA (2014); Parcel data downloaded from VCGI (2014); Study Area prepared by VHB (2015).





WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2015-1-1Up

Project Site: BDE Grand Isle Solar Project City/County: Grand Isle Samp. Date: 9/15/2015
Applicant/Owner: BDE Grand Isle Solar Project, LLC State: VT Sampling Point: 2015-1-1Up
Investigator(s): P. Kalfelz-Werts, M. Jackman Section, Township, Range:
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None Slope (%): 0-3
Subregion (LRR or MLRA): L LRR Lat: 44°41'46.697"N Long: 73°20'5.443"W Datum: NAD 83
Soil Map Unit: Kendia silt loam NWI Class: na
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? YES
Hydric Soil Present? NO
Wetland Hydrology Present? NO
Is This Sample Area Within a Wetland? NO
Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B13) Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible on Aerial (C9)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorph Position (D2)
Inundation Visible on Aerial (B7) Other (Explain in Remarks) Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5) Microtopographic Relief (D4)

Field Observations: Surface Water Present? Depth (inches):
Water Table Present? Depth (inches): Wetland Hydrology Present? NO
Saturation Present? Depth (inches):

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
3.46" of precip in Plattsburgh, NY in the month of September no departure from normal; 0.48" of rain in the 5 days prior.

Remarks:

SOIL

Table with 9 columns: Depth, Matrix, Redox Features (Color, %, Type, Loc), Texture, Remarks. Rows for 0-10 and 10-16 inch depths.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
Histic Epipedon (A2) MLRA 149B)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L)
Stratified Layers (A5) Loamy Gleyed Matrix (F2)
Depleted Below Dark Surface (A11) Depleted Matrix (F3)
Thick Dark Surface (A12) Redox Dark Surface (F6)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7)
Sandy Gleyed Matrix (S4) Redox Depressions (F8)
Sandy Redox (S5)
Stripped Matrix (S6)
Dark Surface (S7) (LRR R, MLRA 149B)
Indicators for Problematic Hydric Soils3:
2 cm Muck (A10) (LRR K, L, MLRA 149B)
Coast Prairie Redox (A16) (LRR K, L, R)
5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Dark Surface (S9) (LRR K, L, M)
Polyvalue Below Surface (S8) (LRR K, L)
Thin Dark Surface (S9) (LRR K, L)
Iron-Manganese Masses (F12) (LRR K, L, R)
Piedmont Floodplain Soils (F19) (MLRA 149B)
Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Red Parent Material (F21)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? NO

Remarks:



	Absolute % Cover	Dom. Sp?	Indicator Status	
Tree Stratum (Plot size: _____ )				Dominance Test Worksheet:
1. _____				# Dominants OBL, FACW, FAC: <u>5</u> (A)
2. _____				# Dominants across all strata: <u>8</u> (B)
3. _____				% Dominants OBL, FACW, FAC: <u>63%</u> (A/B)
4. _____				
5. _____				
6. _____				
7. _____				
				Prevalence Index Worksheet:
				Total % Cover of: Multiply By:
Sapling Stratum (Plot size: <u>15' RAD</u> )				OBL _____ x 1 = _____
1. <b>Juniperus virginiana</b>	<b>38</b>	<b>X</b>	<b>FACU</b>	FACW <b>4</b> x 2 = <b>8</b>
2. <b>Rhamnus cathartica</b>	<b>15</b>	<b>X</b>	<b>FAC</b>	FAC <b>20</b> x 3 = <b>60</b>
3. <b>Fraxinus americana</b>	<b>3</b>		<b>FACU</b>	FACU <b>45</b> x 4 = <b>180</b>
4. <b>Ulmus americana</b>	<b>3</b>		<b>FACW</b>	UPL _____ x 5 = _____
5. _____				Sum: <b>69</b> (A) <b>248</b> (B)
6. _____				Prevalence Index = B/A = <b>3.59</b>
7. _____				
	<b>59</b>		= Total Cover	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size: <u>15' RAD</u> )				<input checked="" type="checkbox"/> Dominance Test is > 50%
1. <b>Lonicera morrowii</b>	<b>3</b>	<b>X</b>	<b>FACU</b>	<input type="checkbox"/> Prevalence Index is <= 3.0
2. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (explain)
3. _____				<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
4. _____				<input type="checkbox"/> Morphological Adaptations
5. _____				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
6. _____				Definitions of Vegetation Strata:
7. _____				Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).
	<b>3</b>		= Total Cover	Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.
Herb Stratum (Plot size: <u>5' RAD</u> )				Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.
1. <b>Eurybia divaricata</b>	<b>3</b>	<b>X</b>	<b>FAC</b>	Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.
2. <b>Anemone canadensis</b>	<b>1</b>	<b>X</b>	<b>FACW</b>	
3. <b>Rhus hirta</b>	<b>1</b>	<b>X</b>	<b>FACU</b>	
4. <b>Toxicodendron radicans</b>	<b>1</b>	<b>X</b>	<b>FAC</b>	
5. <b>Equisetum arvense</b>	<b>1</b>	<b>X</b>	<b>FAC</b>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<b>7</b>		= Total Cover	Woody vine - All woody vines, regardless of height.
Woody Vines (Plot size: _____ )				Hydrophytic Vegetation Present? <u>YES</u>
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
			= Total Cover	

Remarks: (If observed, list morphological adaptations below).



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2015-1-1Wet

Project Site: BDE Grand Isle Solar Project City/County: Grand Isle Samp. Date: 9/15/2015
Applicant/Owner: BDE Grand Isle Solar Project, LLC State: VT Sampling Point: 2015-1-1Wet
Investigator(s): P. Kalfelz-Werts, M. Jackman Section, Township, Range:
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 0-3
Subregion (LRR or MLRA): L LRR Lat: 44°41'46.645"N Long: 73°20'5.934"W Datum: NAD 83
Soil Map Unit: Kendia silt loam NWI Class: PFO, PSS
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? YES
Hydric Soil Present? YES
Wetland Hydrology Present? YES
Is This Sample Area Within a Wetland? YES
Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9)
High Water Table (A2) Aquatic Fauna (B13)
X Saturation (A3) Marl Deposits (B13)
Water Marks (B1) Hydrogen Sulfide Odor (C1)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3)
Drift Deposits (B3) Presence of Reduced Iron (C4)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6)
Iron Deposits (B5) Thin Muck Surface (C7)
Inundation Visible on Aerial (B7) Other (Explain in Remarks)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

Field Observations:
Surface Water Present?
Water Table Present?
Saturation Present? X
Depth (inches): 10"
Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
3.46" of precip in Plattsburgh, NY in the month of September no departure from normal; 0.48" of rain in the 5 days prior.
Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)
Table with columns: Depth, Matrix, Redox Features, Texture, Remarks.
0-8 10YR 3/2 100
8-16 2.5y 5/2 93 2.5Y 5/6 7 C M SANDY LOAM

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
Histic Epipedon (A2) MLRA 149B)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L)
Stratified Layers (A5) Loamy Gleyed Matrix (F2)
Depleted Below Dark Surface (A11) X Depleted Matrix (F3)
Thick Dark Surface (A12) Redox Dark Surface (F6)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7)
Sandy Gleyed Matrix (S4) Redox Depressions (F8)
Sandy Redox (S5)
Stripped Matrix (S6)
Dark Surface (S7) (LRR R, MLRA 149B)
Indicators for Problematic Hydric Soils3:
2 cm Muck (A10) (LRR K, L, MLRA 149B)
Coast Prairie Redox (A16) (LRR K, L, R)
5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Dark Surface (S9) (LRR K, L, M)
Polyvalue Below Surface (S8) (LRR K, L)
Thin Dark Surface (S9) (LRR K, L)
Iron-Manganese Masses (F12) (LRR K, L, R)
Piedmont Floodplain Soils (F19) (MLRA 149B)
Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Red Parent Material (F21)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? YES

Remarks:



	Absolute % Cover	Dom. Sp?	Indicator Status	
Tree Stratum (Plot size: _____ )				Dominance Test Worksheet:
1. _____				# Dominants OBL, FACW, FAC: <u>2</u> (A)
2. _____				# Dominants across all strata: <u>2</u> (B)
3. _____				% Dominants OBL, FACW, FAC: <u>100%</u> (A/B)
4. _____				
5. _____				
6. _____				
7. _____				
				Prevalence Index Worksheet:
				Total % Cover of: <u>6</u> Multiply By: <u>3</u>
				OBL <u>6</u> x 1 = <u>6</u>
				FACW _____ x 2 = _____
				FAC <u>4</u> x 3 = <u>12</u>
				FACU _____ x 4 = _____
				UPL _____ x 5 = _____
				Sum: <u>10</u> (A) <u>18</u> (B)
				Prevalence Index = B/A = <u>1.80</u>
Sapling Stratum (Plot size: <u>15' RAD</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
				Hydrophytic Vegetation Indicators:
				<input checked="" type="checkbox"/> Dominance Test is > 50%
				<input checked="" type="checkbox"/> Prevalence Index is <= 3.0
				_____ Problematic Hydrophytic Vegetation <sup>1</sup> (explain)
				_____ Rapid Test for Hydrophytic Vegetation
				_____ Morphological Adaptations
				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Definitions of Vegetation Strata:
				Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).
				Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.
				Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.
				Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.
				Woody vine - All woody vines, regardless of height.
				Hydrophytic Vegetation Present? <u>YES</u>
Shrub Stratum (Plot size: <u>15' RAD</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
Herb Stratum (Plot size: <u>5' RAD</u> )				
1. <b>Glyceria striata</b>	<b>3</b>	<b>X</b>	<b>OBL</b>	
2. <b>Symphotrichum lateriflorum</b>	<b>3</b>	<b>X</b>	<b>FAC</b>	
3. <b>Acer negundo</b>	<b>1</b>		<b>FAC</b>	
4. <b>Carex echinata</b>	<b>1</b>		<b>OBL</b>	
5. <b>Galium palustre</b>	<b>1</b>		<b>OBL</b>	
6. <b>Lycopus americanus</b>	<b>1</b>		<b>OBL</b>	
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<b>10</b>			
Woody Vines (Plot size: _____ )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				

Remarks: (If observed, list morphological adaptations below).



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2015-1-2Up

Project Site: BDE Grand Isle Solar Project City/County: Grand Isle Samp. Date: 9/15/2015
Applicant/Owner: BDE Grand Isle Solar Project, LLC State: VT Sampling Point: 2015-1-2Up
Investigator(s): P. Kalfelz-Werts, M. Jackman Section, Township, Range:
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None Slope (%): 3-8
Subregion (LRR or MLRA): L LRR Lat: 44°41'48.448"N Long: 73°20'6.005"W Datum: NAD 83
Soil Map Unit: Amenia silt loam NWI Class: na
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? NO
Hydric Soil Present? NO
Wetland Hydrology Present? NO
Is This Sample Area Within a Wetland? NO
Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B13) Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible on Aerial (C9)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorph Position (D2)
Inundation Visible on Aerial (B7) Other (Explain in Remarks) Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? Depth (inches):
Saturation Present? Depth (inches):
Wetland Hydrology Present? NO

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
3.46" of precip in Plattsburgh, NY in the month of September no departure from normal; 0.48" of rain in the 5 days prior.

Remarks:

SOIL

Table with 8 columns: Depth, Matrix, Redox Features (Color, %, Type, Loc), Texture, Remarks. Data for 0-8 and 8-14 inch depths.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B) 2 cm Muck (A10) (LRR K, L, MLRA 149B)
Histic Epipedon (A2) MLRA 149B) Coast Prairie Redox (A16) (LRR K, L, R)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B) 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L) Dark Surface (S9) (LRR K, L, M)
Stratified Layers (A5) Loamy Gleyed Matrix (F2) Polyvalue Below Surface (S8) (LRR K, L)
Depleted Below Dark Surface (A11) Depleted Matrix (F3) Thin Dark Surface (S9) (LRR K, L)
Thick Dark Surface (A12) Redox Dark Surface (F6) Iron-Manganese Masses (F12) (LRR K, L, R)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Piedmont Floodplain Soils (F19) (MLRA 149B)
Sandy Gleyed Matrix (S4) Redox Depressions (F8) Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Sandy Redox (S5) Very Shallow Dark Surface (TF12)
Stripped Matrix (S6) 3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Red Parent Material (F21)
Dark Surface (S7) (LRR R, MLRA 149B) Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? NO

Remarks:





		Absolute % Cover	Dom. Sp?	Indicator Status	
Tree Stratum	(Plot size: _____ )				<b>Dominance Test Worksheet:</b> # Dominants OBL, FACW, FAC: <u>1</u> (A)  # Dominants across all strata: <u>5</u> (B)  % Dominants OBL, FACW, FAC: <u>20%</u> (A/B)
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
		_____ = Total Cover			<b>Prevalence Index Worksheet:</b> Total % Cover of: _____ Multiply By: _____ OBL _____ x 1 = _____ FACW _____ x 2 = _____ FAC <u>16</u> x 3 = <u>48</u> FACU <u>90</u> x 4 = <u>360</u> UPL <u>3</u> x 5 = <u>15</u> Sum: <u>109</u> (A) <u>423</u> (B)  Prevalence Index = B/A = <u>3.88</u>
Sapling Stratum	(Plot size: <u>15' RAD</u> )				
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
		_____ = Total Cover			
Shrub Stratum	(Plot size: <u>15' RAD</u> )				<b>Hydrophytic Vegetation Indicators:</b> _____ Dominance Test is > 50% _____ Prevalence Index is <= 3.0 _____ Problematic Hydrophytic Vegetation <sup>1</sup> (explain) _____ Rapid Test for Hydrophytic Vegetation _____ Morphological Adaptations  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
		_____ = Total Cover			
Herb Stratum	(Plot size: <u>5' RAD</u> )				<b>Definitions of Vegetation Strata:</b>  Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).  Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.  Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.  Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.  Woody vine - All woody vines, regardless of height.
1.	<b>Galium mollugo</b>	<b>38</b>	<b>X</b>	<b>FACU</b>	
2.	<b>Trifolium repens</b>	<b>15</b>	<b>X</b>	<b>FACU</b>	
3.	<b>Equisetum arvense</b>	<b>15</b>	<b>X</b>	<b>FAC</b>	
4.	<b>Melilotus albus</b>	<b>15</b>	<b>X</b>	<b>FACU</b>	
5.	<b>Centaurea stoebe</b>	<b>15</b>	<b>X</b>	<b>FACU</b>	
6.	<b>Daucus carota</b>	<b>3</b>		<b>UPL</b>	
7.	<b>Fragaria virginiana</b>	<b>3</b>		<b>FACU</b>	
8.	<b>Setaria viridis</b>	<b>3</b>		<b>FACU</b>	
9.	<b>Vicia sativa</b>	<b>1</b>		<b>FACU</b>	
10.	<b>Juncus tenuis</b>	<b>1</b>		<b>FAC</b>	
11.	_____	_____	_____	_____	
12.	_____	_____	_____	_____	
		<b>109</b> = Total Cover			
Woody Vines	(Plot size: _____ )				
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
		_____ = Total Cover			
Hydrophytic Vegetation Present? <u>NO</u>					

Remarks: (If observed, list morphological adaptations below).



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2015-1-2Wet

Project Site: BDE Grand Isle Solar Project City/County: Grand Isle Samp. Date: 9/15/2015
Applicant/Owner: BDE Grand Isle Solar Project, LLC State: VT Sampling Point: 2015-1-2Wet
Investigator(s): P. Kalfelz-Werts, M. Jackman Section, Township, Range:
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None Slope (%): 3-8
Subregion (LRR or MLRA): L LRR Lat: 44°41'48.447"N Long: 73°20'6.049"W Datum: NAD 83
Soil Map Unit: Amenia silt loam NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? YES
Hydric Soil Present? YES
Wetland Hydrology Present? YES
Is This Sample Area Within a Wetland? YES
Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9)
High Water Table (A2) Aquatic Fauna (B13)
X Saturation (A3) Marl Deposits (B13)
Water Marks (B1) Hydrogen Sulfide Odor (C1)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3)
Drift Deposits (B3) Presence of Reduced Iron (C4)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6)
Iron Deposits (B5) Thin Muck Surface (C7)
Inundation Visible on Aerial (B7) Other (Explain in Remarks)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? Depth (inches):
Saturation Present? Depth (inches):
Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
3.46" of precip in Plattsburgh, NY in the month of September no departure from normal; 0.48" of rain in the 5 days prior.
Remarks:

SOIL

Table with 8 columns: Depth, Matrix, Redox Features (Color, %, Type, Loc), Texture, Remarks. Rows for 0-10 and 10-16 inch depths.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
Histic Epipedon (A2) MLRA 149B)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L)
Stratified Layers (A5) Loamy Gleyed Matrix (F2)
Depleted Below Dark Surface (A11) X Depleted Matrix (F3)
Thick Dark Surface (A12) Redox Dark Surface (F6)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7)
Sandy Gleyed Matrix (S4) Redox Depressions (F8)
Sandy Redox (S5)
Stripped Matrix (S6)
Dark Surface (S7) (LRR R, MLRA 149B)
Indicators for Problematic Hydric Soils3:
2 cm Muck (A10) (LRR K, L, MLRA 149B)
Coast Prairie Redox (A16) (LRR K, L, R)
5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Dark Surface (S9) (LRR K, L, M)
Polyvalue Below Surface (S8) (LRR K, L)
Thin Dark Surface (S9) (LRR K, L)
Iron-Manganese Masses (F12) (LRR K, L, R)
Piedmont Floodplain Soils (F19) (MLRA 149B)
Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Red Parent Material (F21)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? YES

Remarks:



Tree Stratum	(Plot size: _____ )	Absolute % Cover	Dom. Sp?	Indicator Status	
1.	_____	_____	_____	_____	Dominance Test Worksheet: # Dominants OBL, FACW, FAC: <u>6</u> (A)  # Dominants across all strata: <u>6</u> (B)  % Dominants OBL, FACW, FAC: <u>100%</u> (A/B)
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
				= Total Cover	Prevalence Index Worksheet: Total % Cover of: OBL <u>49</u> x 1 = <u>49</u> FACW <u>30</u> x 2 = <u>60</u> FAC <u>38</u> x 3 = <u>114</u> FACU _____ x 4 = _____ UPL _____ x 5 = _____ Sum: <u>117</u> (A) <u>223</u> (B)  Prevalence Index = B/A = <u>1.91</u>
Sapling Stratum (Plot size: <u>15' RAD</u> )					
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
				= Total Cover	
Shrub Stratum (Plot size: <u>15' RAD</u> )					
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
				= Total Cover	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is > 50% <input checked="" type="checkbox"/> Prevalence Index is <= 3.0 _____ Problematic Hydrophytic Vegetation <sup>1</sup> (explain) _____ Rapid Test for Hydrophytic Vegetation _____ Morphological Adaptations  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.  Definitions of Vegetation Strata:  Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).  Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.  Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.  Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.  Woody vine - All woody vines, regardless of height.   Hydrophytic Vegetation Present? <u>YES</u>
Herb Stratum (Plot size: <u>5' RAD</u> )					
1.	<u>Equisetum arvense</u>	<u>38</u>	<u>X</u>	<u>FAC</u>	
2.	<u>Typha angustifolia</u>	<u>15</u>	<u>X</u>	<u>OBL</u>	
3.	<u>Galium palustre</u>	<u>15</u>	<u>X</u>	<u>OBL</u>	
4.	<u>Impatiens capensis</u>	<u>15</u>	<u>X</u>	<u>FACW</u>	
5.	<u>Carex vulpinoidea</u>	<u>15</u>	<u>X</u>	<u>OBL</u>	
6.	<u>Symphotrichum novae-angliae</u>	<u>15</u>	<u>X</u>	<u>FACW</u>	
7.	<u>Carex crinita</u>	<u>3</u>		<u>OBL</u>	
8.	<u>Scirpus atrovirens</u>	<u>1</u>		<u>OBL</u>	
9.	_____	_____	_____	_____	
10.	_____	_____	_____	_____	
11.	_____	_____	_____	_____	
12.	_____	_____	_____	_____	
				= Total Cover	
Woody Vines (Plot size: _____ )					
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
				= Total Cover	

Remarks: (If observed, list morphological adaptations below).



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2015-1-3Up

Project Site: BDE Grand Isle Solar Project City/County: Grand Isle Samp. Date: 9/15/2015
Applicant/Owner: BDE Grand Isle Solar Project, LLC State: VT Sampling Point: 2015-1-3Up
Investigator(s): P. Kalfelz-Werts, M. Jackman Section, Township, Range:
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None Slope (%): 3-8
Subregion (LRR or MLRA): L LRR Lat: 44°41'57.132"N Long: 73°20'9.552"W Datum: NAD 83
Soil Map Unit: Amenia silt loam NWI Class: na
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? YES
Hydric Soil Present? YES
Wetland Hydrology Present? NO
Is This Sample Area Within a Wetland? NO
Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B13) Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible on Aerial (C9)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorph Position (D2)
Inundation Visible on Aerial (B7) Other (Explain in Remarks) Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5) Microtopographic Relief (D4)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? Depth (inches):
Saturation Present? Depth (inches):
Wetland Hydrology Present? NO

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
3.46" of precip in Plattsburgh, NY in the month of September no departure from normal; 0.48" of rain in the 5 days prior.

Remarks:

SOIL

Table with 9 columns: Depth, Matrix, Redox Features (Color, %, Type, Loc), Texture, Remarks. Rows for 0-8 and 8-14 inch depths.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B) 2 cm Muck (A10) (LRR K, L, MLRA 149B)
Histic Epipedon (A2) MLRA 149B) Coast Prairie Redox (A16) (LRR K, L, R)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B) 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L) Dark Surface (S9) (LRR K, L, M)
Stratified Layers (A5) Loamy Gleyed Matrix (F2) Polyvalue Below Surface (S8) (LRR K, L)
Depleted Below Dark Surface (A11) X Depleted Matrix (F3) Thin Dark Surface (S9) (LRR K, L)
Thick Dark Surface (A12) X Redox Dark Surface (F6) Iron-Manganese Masses (F12) (LRR K, L, R)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Piedmont Floodplain Soils (F19) (MLRA 149B)
Sandy Gleyed Matrix (S4) Redox Depressions (F8) Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Sandy Redox (S5) Very Shallow Dark Surface (TF12)
Stripped Matrix (S6) 3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
Dark Surface (S7) (LRR R, MLRA 149B) Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? YES

Remarks:



	Absolute % Cover	Dom. Sp?	Indicator Status	
Tree Stratum (Plot size: _____ )				Dominance Test Worksheet:
1. _____	_____	_____	_____	# Dominants OBL, FACW, FAC: <u>3</u> (A)
2. _____	_____	_____	_____	# Dominants across all strata: <u>3</u> (B)
3. _____	_____	_____	_____	% Dominants OBL, FACW, FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	= Total Cover			Prevalence Index Worksheet:
Sapling Stratum (Plot size: <u>15' RAD</u> )				Total % Cover of:
1. _____	_____	_____	_____	OBL <u>76</u> x 1 = <u>76</u>
2. _____	_____	_____	_____	FACW <u>42</u> x 2 = <u>84</u>
3. _____	_____	_____	_____	FAC <u>3</u> x 3 = <u>9</u>
4. _____	_____	_____	_____	FACU <u>1</u> x 4 = <u>4</u>
5. _____	_____	_____	_____	UPL _____ x 5 = _____
6. _____	_____	_____	_____	Sum: <u>122</u> (A) <u>173</u> (B)
7. _____	_____	_____	_____	Prevalence Index = B/A = <u>1.42</u>
	= Total Cover			Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size: <u>15' RAD</u> )				<input checked="" type="checkbox"/> Dominance Test is > 50%
1. _____	_____	_____	_____	<input checked="" type="checkbox"/> Prevalence Index is <= 3.0
2. _____	_____	_____	_____	_____ Problematic Hydrophytic Vegetation <sup>1</sup> (explain)
3. _____	_____	_____	_____	_____ Rapid Test for Hydrophytic Vegetation
4. _____	_____	_____	_____	_____ Morphological Adaptations
5. _____	_____	_____	_____	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
6. _____	_____	_____	_____	Definitions of Vegetation Strata:
7. _____	_____	_____	_____	Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).
	= Total Cover			Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.
Herb Stratum (Plot size: <u>5' RAD</u> )				Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.
1. <b>Carex crinita</b>	<b>38</b>	<b>X</b>	<b>OBL</b>	Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.
2. <b>Phalaris arundinacea</b>	<b>38</b>	<b>X</b>	<b>FACW</b>	
3. <b>Carex vulpinoidea</b>	<b>38</b>	<b>X</b>	<b>OBL</b>	
4. <b>Eupatorium perfoliatum</b>	<b>3</b>		<b>FACW</b>	
5. <b>Juncus tenuis</b>	<b>3</b>		<b>FAC</b>	
6. <b>Trifolium pratense</b>	<b>1</b>		<b>FACU</b>	
7. <b>Fraxinus pennsylvanica</b>	<b>1</b>		<b>FACW</b>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	<b>122</b> = Total Cover			Woody vine - All woody vines, regardless of height.
Woody Vines (Plot size: _____ )				Hydrophytic Vegetation Present? <u>YES</u>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	= Total Cover			

Remarks: (If observed, list morphological adaptations below).



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2015-1-3Wet

Project Site: BDE Grand Isle Solar Project City/County: Grand Isle Samp. Date: 9/15/2015
Applicant/Owner: BDE Grand Isle Solar Project, LLC State: VT Sampling Point: 2015-1-3Wet
Investigator(s): P. Kalfelz-Werts, M. Jackman Section, Township, Range:
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None Slope (%): 3-8
Subregion (LRR or MLRA): L LRR Lat: 44°41'55.827"N Long: 73°20'11.3"W Datum: NAD 83
Soil Map Unit: Amenia silt loam NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? NO
Hydric Soil Present? YES
Wetland Hydrology Present? YES
Is This Sample Area Within a Wetland? NO
Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10)
X Saturation (A3) Marl Deposits (B13) Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible on Aerial (C9)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorph Position (D2)
Inundation Visible on Aerial (B7) Other (Explain in Remarks) Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? Depth (inches):
Saturation Present? X Depth (inches): 8
Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
3.46" of precip in Plattsburgh, NY in the month of September no departure from normal; 0.48" of rain in the 5 days prior.

Remarks:

SOIL

Table with 9 columns: Depth (in), Matrix, Color (moist), %, Redox Features (Color (moist), %, Type1, Loc2), Texture, Remarks. Rows include 0-3, 3-8, and 8-14 depth intervals.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B) 2 cm Muck (A10) (LRR K, L, MLRA 149B)
Histic Epipedon (A2) MLRA 149B) Coast Prairie Redox (A16) (LRR K, L, R)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B) 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L) Dark Surface (S9) (LRR K, L, M)
Stratified Layers (A5) Loamy Gleyed Matrix (F2) Polyvalue Below Surface (S8) (LRR K, L)
Depleted Below Dark Surface (A11) Depleted Matrix (F3) Thin Dark Surface (S9) (LRR K, L)
Thick Dark Surface (A12) X Redox Dark Surface (F6) Iron-Manganese Masses (F12) (LRR K, L, R)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Piedmont Floodplain Soils (F19) (MLRA 149B)
Sandy Gleyed Matrix (S4) Redox Depressions (F8) Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Sandy Redox (S5) Very Shallow Dark Surface (TF12)
Stripped Matrix (S6) 3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Other (Explain in Remarks)
Dark Surface (S7) (LRR R, MLRA 149B)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? YES

Remarks:



Tree Stratum	(Plot size: _____ )	Absolute % Cover	Dom. Sp?	Indicator Status	
1.	_____	_____	_____	_____	Dominance Test Worksheet: # Dominants OBL, FACW, FAC: _____ (A)  # Dominants across all strata: <u>1</u> (B)  % Dominants OBL, FACW, FAC: _____ (A/B)
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
_____ = Total Cover					Prevalence Index Worksheet: Total % Cover of: _____ Multiply By: _____ OBL _____ x 1 = _____ FACW _____ x 2 = _____ FAC <u>1</u> x 3 = <u>3</u> FACU <u>18</u> x 4 = <u>72</u> UPL _____ x 5 = _____ Sum: <u>19</u> (A) _____ <u>75</u> (B)  Prevalence Index = B/A = <u>3.95</u>
Sapling Stratum (Plot size: <u>15' RAD</u> )					
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
_____ = Total Cover					
Shrub Stratum (Plot size: <u>15' RAD</u> )					Hydrophytic Vegetation Indicators: _____ Dominance Test is > 50% _____ Prevalence Index is <= 3.0 _____ Problematic Hydrophytic Vegetation <sup>1</sup> (explain) _____ Rapid Test for Hydrophytic Vegetation _____ Morphological Adaptations  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
_____ = Total Cover					
Herb Stratum (Plot size: <u>5' RAD</u> )					Definitions of Vegetation Strata:  Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).  Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.  Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.  Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.  Woody vine - All woody vines, regardless of height.
1.	<b>Trifolium repens</b>	<b>15</b>	<b>X</b>	<b>FACU</b>	
2.	<b>Glycine max</b>	<b>3</b>		<b>FACU</b>	
3.	<b>Echinochloa crus-galli</b>	<b>1</b>		<b>FAC</b>	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
8.	_____	_____	_____	_____	
9.	_____	_____	_____	_____	
10.	_____	_____	_____	_____	
11.	_____	_____	_____	_____	
12.	_____	_____	_____	_____	
<b>19</b> = Total Cover					
Woody Vines (Plot size: _____ )					
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
_____ = Total Cover					Hydrophytic Vegetation Present? <u>NO</u>

Remarks: (If observed, list morphological adaptations below).

**BDE Grand Isle-Johnson Solar Project**  
**Grand Isle, Vermont**  
**Summary of Delineated Wetlands and Streams**  
**Prepared by VHB (P. Kallfelz-Werts, M. Jacmkan)**  
**October 30, 2015**

VHB Delineated Wetlands										
Wetland ID	Delineated Area (Square Feet) <sup>1</sup>	Cowardin Classification <sup>2</sup>	Vermont Wetland Rules Classification						Typical Vegetation	Comments
			Contiguous to a VSWI-mapped Wetland?	Riparian Wetland Contiguous to Stream Channel? (Flow Regime) <sup>3</sup>	VWR Section 4.6 Presumptions <sup>4</sup>	VWR Section 5 Functional Criteria Presence/Significance		VHB Proposed VWR Classification <sup>6</sup>		
						Type <sup>5</sup>	VHB-Proposed Significant?			
2015-1	<b>215,845</b>	PEM/PFO/PSS	Yes	Yes	a,b,c	5.1(P), 5.2(H), 5.4(H), 5.10(L)	Yes	II	<i>Typha latifolia, Phalaris arundinacea</i>	2015-1 is a high functioning wetland complex which contains several cover classes with potential to provide a wide range of habitat
2015-2	<b>3,710</b>	PSS	Yes	No	a	5.2(P)	Yes	II	<i>Cornus amomum, Phalaris arundinacea</i>	2015-2 is a small wetland which is contiguous to a VSWI-mapped feature; the wetland is located in a topographic depression in a shrub/ young deciduous forested area, and extends very slightly into the adjacent agricultural field

<sup>1</sup>All wetlands field-delineated per the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northeast and North Central Region. U.S. Army Corps of Engineers. 2011; Delineated Wetlands that extend outside the Study Area are **Bold**.

<sup>2</sup>Classification follows Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitat of the United States. U.S. Fish and Wildlife Service. FWS/OBD-79/31. 103pp.

<sup>3</sup>Wetland contiguity to streams as defined in the Vermont ANR 12/9/05 *Guidance for Agency Act 250 and Section 248 Comments Regarding Riparian Buffers* and confirmed if a delineated perennial or intermittent stream channel inflows, through flows, and outflows from a delineated wetland (ephemeral channels not typically being subject to ANR Riparian Buffer Guidance). The vegetative assemblage or natural community type is used when determining riparian vegetation function. Flow regime determined based on qualitative observations of instream hydrology indicators and geomorphic characteristic and are subject to professional judgment (P=perennial, I=intermittent, E=ephemeral).

<sup>4</sup>Alpha-numeric codes correspond with Section 4.6 Presumptions, of the 2010 Vermont Wetland Rules.

<sup>5</sup>VWR Section 5: Functional Criteria for Evaluating a Wetland's Significance: 5.1=Water Storage for Flood Water and Storm Runoff, 5.2=Surface and Groundwater Protection, 5.3=Fish Habitat, 5.4=Wildlife Habitat, 5.5=Exemplary Wetland Natural Community, 5.6=Rare, Threatened or Endangered Species Habitat, 5.7=Education and Research in Natural Sciences, 5.8=Recreational Value and Economic Benefits, 5.9=Open Space and Aesthetics, 5.10=Erosion Control Through Binding and Stabilizing the Soil. (P)= Present, (H)=High, (L)=Low; Correspond to observed level of functionality

<sup>6</sup>VHB-Proposed VWR Classification is based on review and application of the VWR, particularly VHB's interpretation of Section 4.6 Presumptions and is subject to final determinations by the ANR-DEC. DEC Wetland Scientist Zapata Courage conducted a site visit on October 20, 2015.

VHB Delineated Streams												
Stream ID	Stream Name	Associated Wetlands	Average Ordinary High Water Width (OHW) Feet <sup>1</sup>	Dominant Substrate	Water Depth (Inches)	Bank Height (Inches)	Flow Regime (Ephemeral Intermittent or Perennial) <sup>2</sup>	ANR Mapped River Corridor (Yes or No)	VHB Mapped River Corridor (Yes or No)	Watershed Size (square miles) <sup>3</sup>	VWQS Classification (2014) <sup>4</sup>	Comments
2015-JD-1	na	2015-1	3	Silt/ Vegetation	3	24	Intermittent	No	No	< 0.5	B	Jurisdictional ditch which flows through portions of Wetland 2015-1

<sup>1</sup>U.S. Army Corps of Engineers (USACE). 2005. "Regulatory Guidance Letter. Subject: Ordinary High Water Mark Identification." No. 05-05.

<sup>2</sup>Stream flow regime determined based on qualitative observations of in stream hydrology indicators and geomorphic characteristic and are subject to professional judgment.

<sup>3</sup>Watershed size was determined from Vermont ANR Stream Alteration Regulatory Program mapping. Watershed Sizes Used as Guidance in Stream Alteration Regulations for the Town of Grand Isle.

<sup>4</sup>Under Vermont Water Quality Standards (Vt. Code R. 12 004 052), Effective December 30, 2014, the waters found within the Study Area are considered Class B waters.





To: BDE Grand Isle Solar, LLC Project  
File

Date: May 27, 2016

Memorandum

Project #: 57746.02

From: Patti B. Kallfelz-Werts, A. Crary;  
A. Thomas (BDE)

Re: Alternatives and Wetland Impact Avoidance and  
Minimization Summary

---

On behalf of BDE Grand Isle Solar LLC ("BDE"), and in support of the BDE Grand Isle Solar Project ("Project"), VHB has prepared this memorandum to document the natural resources impact avoidance and minimization measures undertaken by BDE during Project development. This memorandum is intended to support BDE's Petition for a Certificate of Public Good ("CPG") from the Public Service Board ("PSB"), submitted November 24, 2015 (Docket No. 8665). This memo also supports the required collateral environmental permit applications, specifically the Individual Vermont Wetland Permit ("VWP"), and the request for General Permit authorization from the U.S. Army Corps of Engineers ("USACE") under Section 404 of the Clean Water Act. As described in detail in the CPG Petition materials, the proposed Project is an approximately 5 MW alternating current ("AC") ground mounted solar project located south of Allen Road / VT Route 314 in Grand Isle, Vermont. A detailed description of the proposed Project is provided in the pre-filed and rebuttal testimony of BDE's Andrew Thomas and supporting exhibits. The following provides a synopsis of the Project's stated purpose/need, alternatives considered, as well as various avoidance/minimization and subsequent mitigation measures taken or proposed to avoid undue adverse impact to wetland function.

The "Section 248 Natural Resources Assessment Memorandum" (VHB 2015), submitted with the CPG Petition as Exhibit BDE-AC-2, includes description of the existing site conditions in the Project Study Area, the natural resources included in the assessment, the individual methodologies for assessing each natural resource, and the findings.

Project Purpose/Need:

The Project purpose is to develop and operate solar energy generation in the Lake Champlain Islands region of Vermont Electric Cooperative ("VEC") service territory. Vermont Act 56 law mandates that VEC build or acquire distributed renewable generation, and generation in this region, as proposed in this Project, will provide low-cost electricity and support peak summer load conditions. VEC can more efficiently meet the mandated goal by supporting the construction of one 5 MW project in a single location, as opposed to the construction and resulting maintenance/operation of numerous smaller solar projects which would potentially have greater collective impacts and would be more costly for VEC members.

Alternative Sites Considered:

The primary factor in assessing sites is finding available and affordable land that will meet the Project purpose. BDE's process involves real estate agents, private land agents, in-house research, and marketing and public outreach. Once a potential site is identified, BDE uses a desktop screening process to determine whether a site warrants further investigation and investment through hiring experts to conduct and initial site visit. If the project development proceeds to the next level, then a site visit is conducted to determine, at a cursory level, the viability of a solar

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Suite 200  
South Burlington, Vermont 05403



## Memorandum

development project at the given site based on a feasibility review of the potential environmental, aesthetic, archeological, geotechnical, electrical, utility interconnection, and customer challenges that the site location presents.

In March 2015, VEC filed a Section 248 petition to construct an approximately 1.5 MW solar generation project in South Hero which VEC subsequently withdrew due to wetland impacts opposed by the Vermont Agency of Natural Resources ("ANR"). BDE's review of land available in the target region (the Lake Champlain Islands region) is a key factor, as there are limited options available that could host a 5 MW solar project as that was the preferred Project capacity. As such, BDE did a desktop review of two additional sites. One is a landfill site in North Hero. That site required at least a 4,500 foot electric line extension through sensitive environmental areas, potential significant upgrades to VEC's infrastructure, and geotechnical analysis of the below grade structural soils capacity, and the membrane material used to cap the prior site use. As such, coupled with high financial risk, the landfill site was not selected. The second site was an approximately 63-acre tract located in Isle La Motte. This site contained areas of potentially sensitive forested areas that would need to be cleared and grubbed in order to prep the necessary acreage for a 5 MW AC project. Based on the environmental constraints expected, BDE did not elect to pursue the Isle La Motte site. The proposed site in Grand Isle was selected based on the close proximity to VEC's existing three phase line, which would not require significant upgrades, and had limited aesthetic, archeological, and environmental challenges when compared to alternative sites considered.

### Alternative Design Concepts

BDE uses a number of criteria to determine project layout, including intensive system modeling to optimize kilowatt hours produced (output) from kilowatt peak (potential capacity). The modeling system generates the most efficient system layout/design. Typically this preferred shape is a continuous rectangle that has a central relationship to the point of interconnection. The preferred layout would also have sufficient row spacing to avoid panel shading impacts as well as no other shading impacts, such as those posed by trees. BDE then relies on the site specific environmental, aesthetic, archeological, geotechnical, shading, and electrical assessments to determine what compromises to the optimal system layout are necessary to mitigate impacts from other constraints.

BDE has considered several design concept layouts prior to selecting the preferred concept that was proposed in the original petition and since revised in May 2016. The Petitioner considered three concepts included in Attachment 1, and this attachment represents the concept plan progression from the preferred (optimal) layout as site constraints were factored. For this Project, the conceptual layout images (from Helioscope) in Attachment 1 demonstrate that over time the scale (and productivity) of this Project has been reduced in order to avoid and minimize wetland impacts. Concept 1 represents the initial and optimal concept. Concept 2 represents a smaller project and the first concept to account for discovery of the wetland system in the center of the Project site. Concept 3 begins to take into account the detailed wetland mapping and forested areas and generally represents the concept used to develop the current site plan. As shown below, Concept 3 is the least productive system proposed. The AC system capacity sizes referred to below assume the concepts maintain the same degree of tilt on the racking, the same module equipment selection, and the same row to row spacing.

Concept 1 is 4.99 AC/6.49 DC

Concept 2 is 4.88 AC/6.35 DC

Concept 3 is 4.05 AC/5.27 DC



Concept 3 is the alternative/current design and has significant financial consequences for the Project. Building two separate arrays requires additional infrastructure, such as underground electric lines and conduit, access road/impervious area, fencing, and also for this project more potential for shade and aesthetic impacts. The concessions made by the Project primarily to avoid/minimize impacts to significant wetlands will prevent the Project from generation at maximum capacity.

Since the Project was conceived, the Petitioner has reduced the conceptual Project size by 22-percent in order to avoid and minimize natural resource impacts. In order for the Project to adjust to less available site area, the Petitioner has modified the system design parameters to achieve 5 MW (AC) of system capacity, which is the design proposed in the May 2016 site plan revision. The Petitioner has made changes in response to Project impact investigations. Examples of these changes are shortening the row to row spacing, utilizing higher producing modules, and reducing the tilt on the racking system. These compromises in system design directly impact the system production capacity and thus create adverse impacts on the financial performance of the Project. At this time, the Petitioner feels the Project has made every attempt to avoid and minimize impacts to natural resources while maintaining the financial viability of a competitive, fixed rate power purchase structured solar power generation project.

#### Avoidance-Minimization-Mitigation

Based on the site constraints, concept planning, and detailed design, activities within Class II wetland and primarily 50-foot buffers are unavoidable. Below are the avoidance and minimization measures which were incorporated into the Project as part of the CPG Petition submittal and also described in various Discovery responses.

- Siting the Project on agricultural lands to avoid undisturbed areas, including using the existing access road from Vermont Route 314;
- Conducting site screening and natural resources assessments early in the Project concept development process to help steer Project design, and avoid impacts to wetlands and buffers;
- Early redesign of the Project into two separate arrays (from an initial, single contiguous array design) to avoid impacts to mapped natural resources (see Attachment 1);
- Minimizing the areas of proposed vegetation management to reduce shading of the solar array, to avoid tree cutting in Class II wetlands and to minimize tree cutting in the buffer; it should be noted that there will still be shading of portions of the array (on all sides except for north). Noteworthy items regarding shade management:
  - BDE has not proposed shade impact management clearing for all areas that are expected to impact the array production. As a general rule, BDE assumes that shade impacts will occur on panels from a distance of 2-times the obstruction height. Using this rule (and approximately 50-foot average existing tree heights), there is approximately 5.05-acres of forest or trees to the east, south, and west of the proposed Project and within the subject property that may create shade impacts ("optimal shade management area"). Of these, BDE is proposing to manage shade impacts in approximately 0.65-acre, or approximately 13-percent of the optimal management area, representing an approximately 87-percent reduction in potential overall tree cutting.
  - Optimal shade management area for the Project would likely result in impacts to forested Class II wetlands, Class II wetland buffers, riparian area, vernal pool functional envelope, potential protected bat roost habitat, and Project screening vegetation.
  - Minimizing the area of proposed tree cutting in the wetland buffer to only the area at the southwest corner of Array 2 (the eastern array), and furthermore only to those trees which are over 40-feet tall (not whole tree removal and with no earth disturbance).



## Memorandum

- BDE will use best management practices ("BMP"s) during tree cutting activities, including adherence to a vegetation management plan.
- Using non-reflective panel coatings to minimize potential indirect effects on wetland dependent wildlife/invertebrates in the vicinity;
- Proposing to use a conservation seed mix rather than a basic erosion control mix or forage crop mix for site stabilization which will include a mix of quick germinating species for site stability, and wildflower species for wildlife value enhancement (the fields are currently either tilled/cultivated or under forage hay crop), and to enhance the existing herbaceous vegetation community which currently exists.

BDE revised the site plans in May 2016 following formal and informal comments and requests from ANR where additional impact avoidance and minimization was requested. Attachment 2 includes both the site plan used for the CPG petition filing and the current revised version for comparison. Largely reflected in the revised version, BDE has incorporated a number of Project design changes in order to further avoid impacts to wetlands. These measures include:

- Changed the Project module specification from a 60 cell module to a 72 cell module (which is a more costly type), this change reduces the number of modules for the project by approximately 5,004. The design change reduces the number of racking support posts and increases the row to row spacing between the racking tables which results in less racking posts in the wetland buffer. This amount of panel reduction would equate to approximately 1.30 MW (DC) using the less expensive and originally proposed 60-cell module. By switching to the 72-cell module, the overall project capacity reduction is 250kW (DC);
- The revised proposed modules and layout reduces the amount of permanent buffer impact from posts by 50-percent (see Table 1. Comparison Summary of Proposed Areas in Class II Wetlands and Buffers, below);
- Removed racking structures and fence posts from the west side of Array 2, and from the south east side of Array 1 to reduce panels and the fenced footprint within this buffer to the higher functioning portion of the wetland (the overall area of the Project perimeter fence within wetland and wetland buffer has been reduced by 100-percent and 55-percent respectively, see Table 1. Comparison Summary of Proposed Areas Class II Wetlands and Buffers, below);
- Converted to the more expensive option of installing the interconnection line underground instead of an overhead line, which will be located immediately adjacent to the proposed access road, and which will avoid approximately 0.2-acre of tree clearing to part of a Class II buffer area in the northern part of the Project site;
- The access road alignment has been shifted in order to minimize impacts to the Class II buffer in the northern part of the Project site;
- Revised the perimeter fence from one contiguous fence line to two separate fences to maintain the central wetland corridor for wildlife travel function and avoid the fence crossing the jurisdictional ditch;
- Revised the access drive for property owner and the perimeter fence (south edge of Array 1) location to avoid any activity in the buffer of Wetland 2015-2;
- For replacement of existing culvert on the access road, note added to plan specifying use of steepened road crossing slopes (1.5:1) to minimize the fill footprint from farm access upgrades;
- VHB has conducted vernal pool surveys in late April 2016 in areas outside (south) of the Project Study Area within Wetland 2015-2 at ANR's request to determine if there are areas which support breeding by vernal pool species. From this, two areas outside of the Project Study Area, one vernal pool within Wetland 2015-2 and one inundated portion of Wetland 2015-2, support breeding by vernal pool species, including wood frogs (*Rana sylvatica*) and



fairy shrimp (*Eubbranchipus sp.*). The area meeting the vernal pool criteria is included on the revised site plan (no direct or indirect impacts to the vernal pool or functional envelope will occur);

- Preparation of a Project-specific vegetation management plan to ensure the tree cutting, which is necessary to prevent undue shading of the array, and is conducted in a way that minimizes wetland buffer function impact;
- Preparation of a supplemental native species planting plan, as part of the vegetation management plan, to enhance the non-forested areas of Class II wetland 2015-1 and buffer proximal to the Project area.

<b>Table 1. Comparison Summary of Proposed Areas in Class II Wetlands and Buffers</b>			
<b>Permit Plan Version (VHB)</b>	Number of Solar Rack Posts in Class II Buffer	Resource Areas Within Perimeter Fence (Sq Ft)	
		Class II Wetland	Class II Buffer
revised date January 11, 2016	276	17,136	96,651
revised date May 23, 2016	139	0	43,741

On behalf of BDE and in support of the proposed BDE Grand Isle Solar Project, VHB has prepared this memo to summarize the alternatives considered and the numerous measures and design revisions BDE has incorporated into the Project to first avoid, and then minimize unavoidable impacts to Class II wetlands and buffers within the Project area. ANR has provided comments and recommendations on the Project intended to ensure maximum avoidance of impacts to Class II wetlands and associated buffers. BDE has incorporated as many avoidance and minimization measures into the Project as feasible, both before and during regulatory review of the Project, while still ensuring the viability of the Project.

**ATTACHMENTS**

1. Design Concept Alternatives Layouts
2. Site Plan Comparison Layout

# **ATTACHMENT 1**

VT Route 314/ Allen Road



Design Concept #1  
May 2015 (Approximate)



**BULLROCK DEUTSCHE-ECO SOLAR**  
NEW ENERGIES. NEW HORIZONS.

VT Route 314/ Allen Road



Design Concept #2  
June 2015 (Approximate)



**BULLROCK DEUTSCHE-ECO SOLAR**  
NEW ENERGIES. NEW HORIZONS.



VT Route 314/ Allen Road



Design Concept #3  
October 2015 (Approximate)



**BULLROCK DEUTSCHE-ECO SOLAR**  
NEW ENERGIES. NEW HORIZONS.

# **ATTACHMENT 2**

**CALCULATIONS**

TOTAL PROJECT AREA (WITHIN PROJECT DEMARCATION FENCE) 25.2 ACRES  
 ARRAY PERIMETER FENCE\* 6,397 L.F.  
 ARRAY PERIMETER FENCE ENCLOSURE AREA 23.9 ACRES  
 SOLAR PANEL CONCEPT\* 38,857.5 L.F.  
 (1033 X 37' RACKS)  
 (38 X 16.75' RACKS)

IMPERVIOUS AREAS  
 GRAVEL DRIVE 24,645 S.F.  
 (AREA RESTORED TO IMPERVIOUS POST CONSTRUCTION) 3,258 S.F.  
 FUTURE DRIVE 17,936 S.F.  
 CONCRETE PADS 1040 S.F.  
 DRIVEN POSTS-SOLAR RACKS  
 (1033 PANELS X 4 POSTS/PANEL @ 0.25 SF/POST) = 1033 S.F.  
 (38 PANELS X 3 POSTS/PANEL @ 0.25 SF/POST = 29 S.F.)  
 DRIVEN POSTS - PERIMETER FENCE  
 (6,397 L.F. / 10 L.F. / POST X 0.33 S.F./POST) = 211 S.F.  
 MISC. ELECTRICAL BOXES  
 (6 X 66.5 S.F. EA.) = 438 S.F.

NEW IMPERVIOUS AREA= 0.82 ACRE

EXISTING IMPERVIOUS AREA = 0.15 ACRE  
 TOTAL IMPERVIOUS AREA = 0.97 ACRES  
 TOTAL AREA TREE REMOVAL = 0.33 ACRES  
 SELECT AREA TREE REMOVAL = 0.65 ACRES  
 TOTAL AREA EARTH DISTURBANCE = 1.24 ACRES

\*: THE LOCATIONS AND AMOUNT OF SOLAR PANELS SHOWN WITHIN THE FENCED ENCLOSURE ARE SUBJECT TO CHANGE PER FINAL ELECTRICAL DESIGN BY OTHERS. THE FENCED ENCLOSURE SHALL BE LOCATED AS SHOWN.



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 802.497.6100

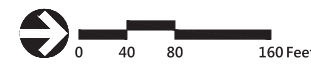
**BDE Grand Isle Solar LLC**  
**Allen Road**  
**Grand Isle, Vermont**

No.	Revision	Date	Apprd.
1	Class II Wetland Buffer	1/11/2016	CH

Designed by \_\_\_\_\_ Checked by \_\_\_\_\_

Issued for **248 Permit Filing** Date **Nov. 24, 2015**

**Not Approved for Construction**  
 Drawing Title: **Site Plan**  
 Drawing Number \_\_\_\_\_




### Summary Table

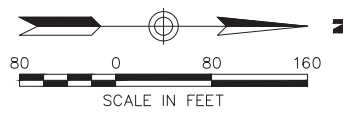
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TOTAL PROJECT AREA WITHIN PERIMETER FENCE	22.85-Ac
LENGTH OF PERIMETER FENCE	6,778-LF
SOLAR TABLE (2x34) COUNT	240-EA
SOLAR TABLE (2x17) COUNT	39-EA
SOLAR TABLE (2x9) COUNT	25-EA
SOLAR MODULE COUNT	18,096-EA
IMPERVIOUS AREA BREAKDOWN:	
PROPOSED GRAVEL ACCESS (L=2,170-LF)	17,558-SF
AREA RESTORED TO PERVIOUS POST CONSTRUCTION	3,000-SF
FUTURE DRIVE (L=1,830-LF)	18,419-SF
AREA OF REDEVELOPED ACCESS	4,244-SF
CONCRETE PADS FOR EQUIPMENT	1,040-SF
MISCELLANEOUS ELECTRICAL BOXES	
6-EA Ø 66.5-SF	400-SF
AREAS OF TREE WORK:	
AREA OF TREE CLEARING/GRUBBING	0.33-Ac
AREA OF SELECT TREE REMOVAL	0.65-Ac
AREA BREAKDOWN:	
AREA OF EXISTING IMPERVIOUS	6,078-SF
AREA OF NEW PROPOSED IMPERVIOUS	34,417-SF
AREA OF TREE CLEARING/GRUBBING	0.33-Ac
AREA OF EARTH DISTURBANCE	
NEW IMPERVIOUS, STAGING AREA, TRENCHING	1.20-Ac
PROJECT COORDINATES: 44°22'56.26"N 71°57'31.83"W	



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**BDE Grand Isle Solar LLC**  
 Allen Road  
 Grand Isle, Vermont

No.	Revision	Date	Appr.
1	Class II Wetland Buffer	1/11/2016	CJH
2	Revised Module/ANR Comments	5/23/2016	CJH

Designed by	Checked by
Issued for	Date
<b>248 Permit Filing</b>	<b>Nov. 24, 2015</b>

**Not Approved for Construction**

Drawing Title:  
**Site Plan**

Drawing Number

Saved Monday, May 23, 2016 11:42:10 AM CHANEY Plotted Monday, May 23, 2016 11:42:39 AM Hickey, Christopher

**Representative Natural Resources Assessment Site Photographs**  
**BDE Grand Isle-Johnson Solar Project**  
**Grand Isle, Vermont**



Photograph 1. Existing distribution line along VT Rt 314 at northern edge of the Study Area, looking east



Photograph 2. South end of existing agricultural access road off VT Rt 314, looking north



Photograph 3. Agricultural access road crossing delineated jurisdictional ditch 2015-JD-1, looking west



Photograph 4. Representative view of the soybean field on the west side of Wetland 2015-1, looking north



Photograph 5. Soybean field on the east side of Study Area, east side of Wetland 2015-1, looking north



Photograph 6. Representative view of hay field on the western edge of the study area

**Representative Natural Resources Assessment Site Photographs**  
**BDE Grand Isle-Johnson Solar Project**  
**Grand Isle, Vermont**



Photograph 7. View of the intermittent jurisdictional ditch channel 2015-JD-1



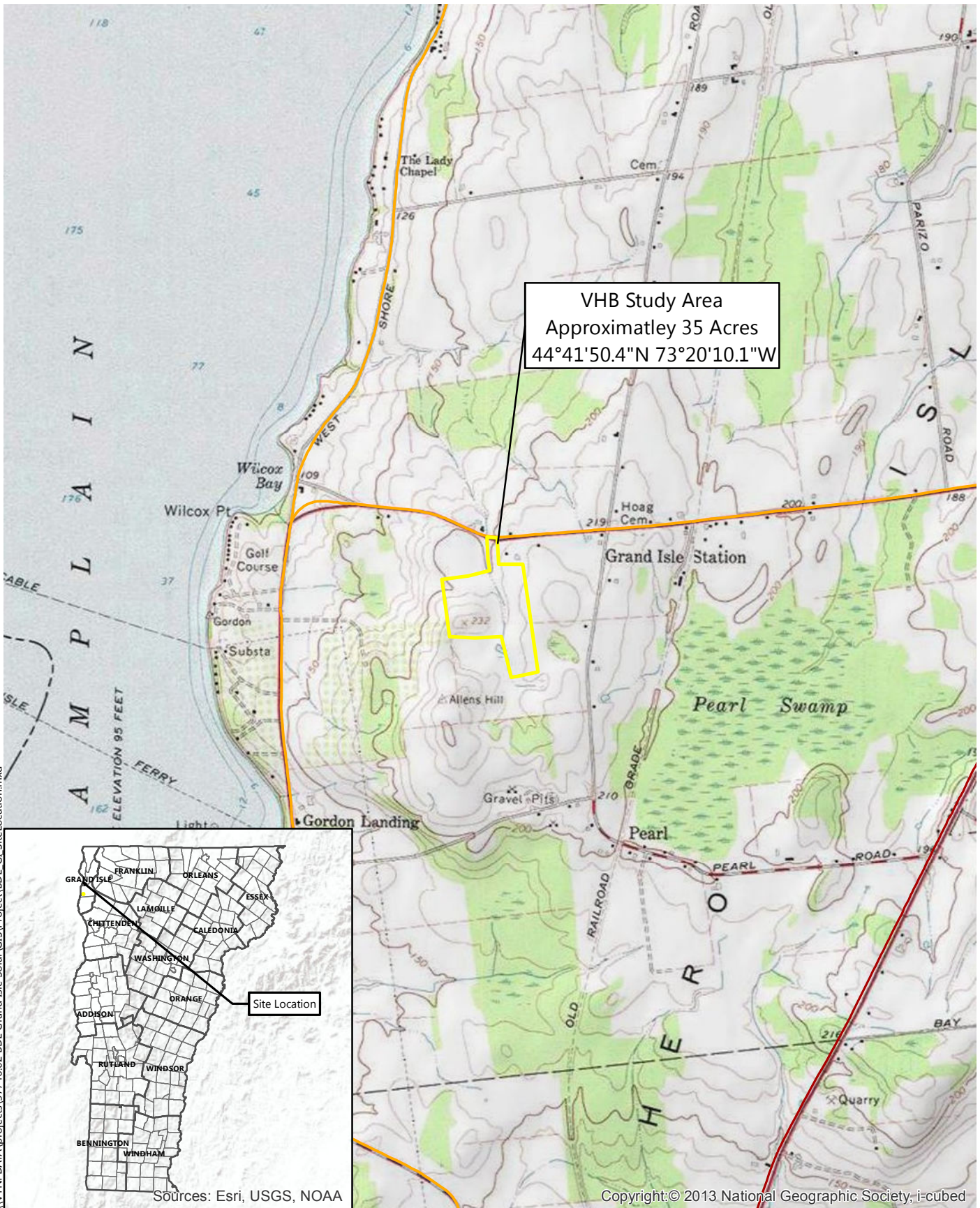
Photograph 8. Class II wetland 2015-1



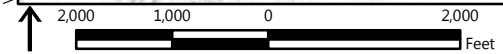
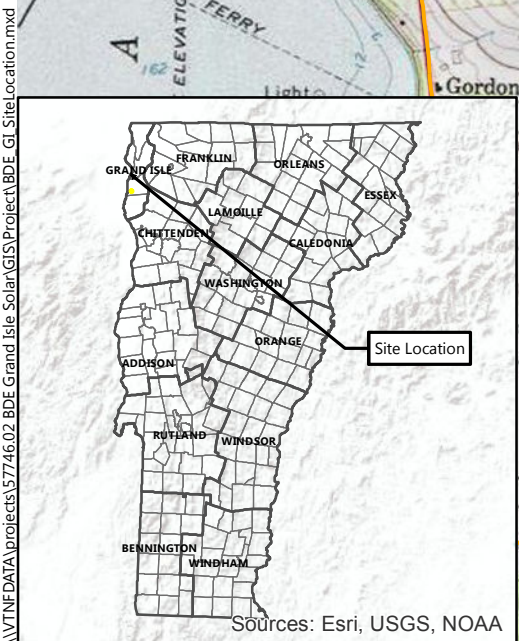
Photograph 9. Class II wetland 2015-1



Photograph 10. Culverts under access road crossing of 2015-JD-1



VHB Study Area  
 Approximately 35 Acres  
 44°41'50.4"N 73°20'10.1"W



- Legend**
- Study Area (VHB)
  - Interstate
  - US Route
  - Vermont State Highway
  - Town Road

**BDE Grand Isle Solar Project**

**Grand Isle, Vermont  
 Site Location Map**

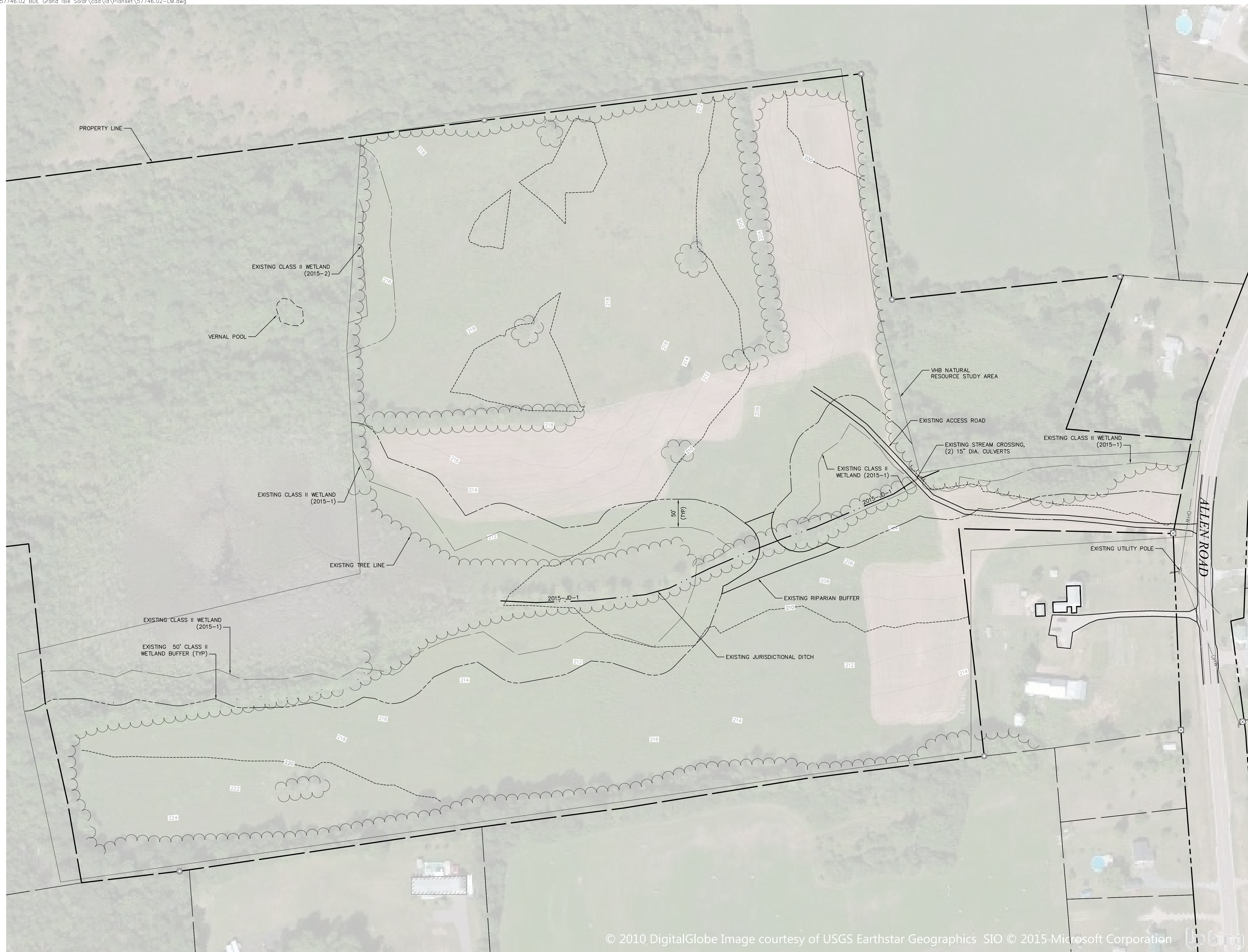
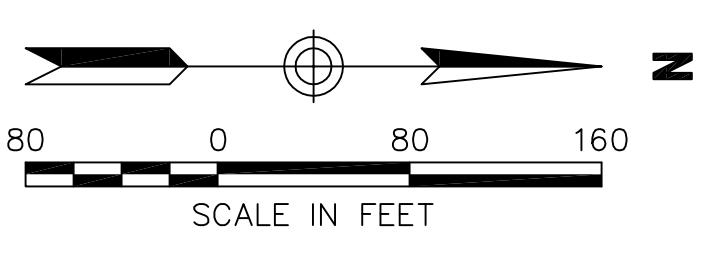
Sources: USGS Topographic Background from National Geographic Society (2013); Town and County boundaries by VCGI (2006); Roads from VTrans (2011); Subwatershed Boundary and discharge points digitized by VHB (2016).

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**BDE Grand Isle Solar LLC**  
Allen Road  
Grand Isle, Vermont

No.	Revision	Date	Apprd.
1	Class II Wetland Buffer	1/11/2016	CJH
2	Revised Module/ANR Comments	5/23/2016	CJH
3	Design Changes in Wetland Buffer	10/17/2016	CJH

Designed by	JMD	Checked by	CJH
Issued for	248 Permit Filing	Date	Nov. 24, 2015

**Not Approved for Construction**  
Existing Conditions Plan

Sheet **C-1** of 3

Project Number  
**57746.02**



### Summary Table

ARRAY SUMMARY:	
TOTAL PROJECT AREA WITHIN PERIMETER FENCE	21.80-Ac
LENGTH OF PERIMETER FENCE	6,787-LF
SOLAR TABLE (2x34) COUNT	210-EA
SOLAR TABLE (2x17) COUNT	68-EA
SOLAR TABLE (2x9) COUNT	20-EA
SOLAR MODULE COUNT	16,952-EA
IMPERVIOUS AREA BREAKDOWN:	
PROPOSED GRAVEL ACCESS (L=2,162-LF)	17,500-SF
AREA RESTORED TO PERVIOUS POST CONSTRUCTION	3,000-SF
FUTURE DRIVE (L=1,830-LF)	18,419-SF
AREA OF REDEVELOPED ACCESS	4,244-SF
CONCRETE PADS FOR EQUIPMENT	1,040-SF
MISCELLANEOUS ELECTRICAL BOXES	
6-EA @ 66.5-SF	400-SF
AREAS OF TREE WORK	
AREA OF TREE CLEARING/GRUBBING	0.33-Ac
AREA OF SELECT TREE REMOVAL	0.65-Ac
AREA BREAKDOWN:	
AREA OF EXISTING IMPERVIOUS	6,078-SF
AREA OF NEW PROPOSED IMPERVIOUS	34,359-SF
AREA OF TREE CLEARING/GRUBBING	0.33-Ac
AREA OF EARTH DISTURBANCE	
NEW IMPERVIOUS, STAGING AREA, TRENCHING	1.20-Ac
PROJECT COORDINATES: 44°22'56.26"N 71°57'31.83"W	

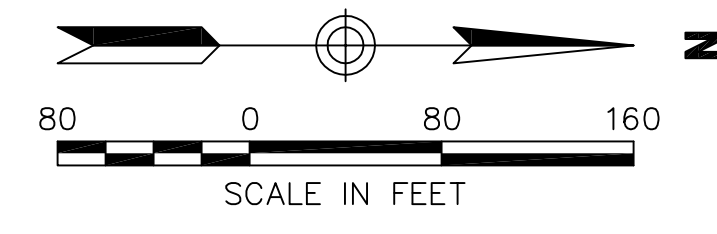


**Split Rail Fence For Wetland Buffer Demarcation** 10/16  
N.T.S. Source: VHB LD.

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**BULLROCK DEUTSCHE-ECO SOLAR**  
NEW ENERGIES. NEW HORIZONS.



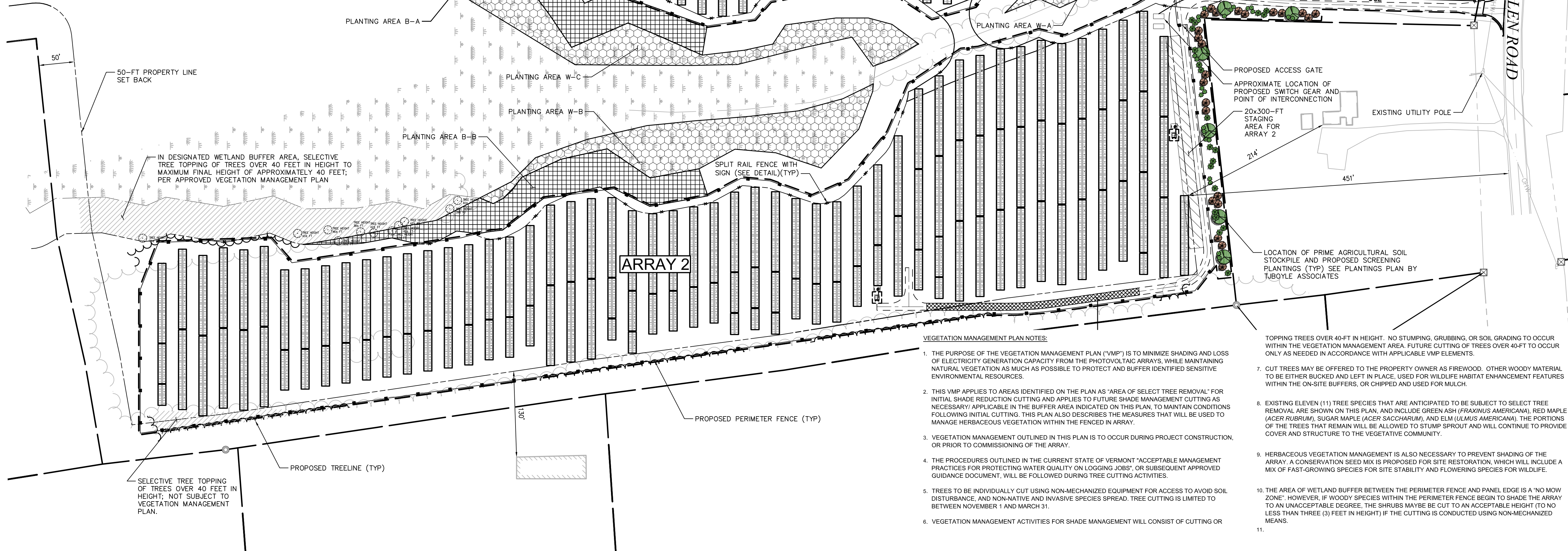
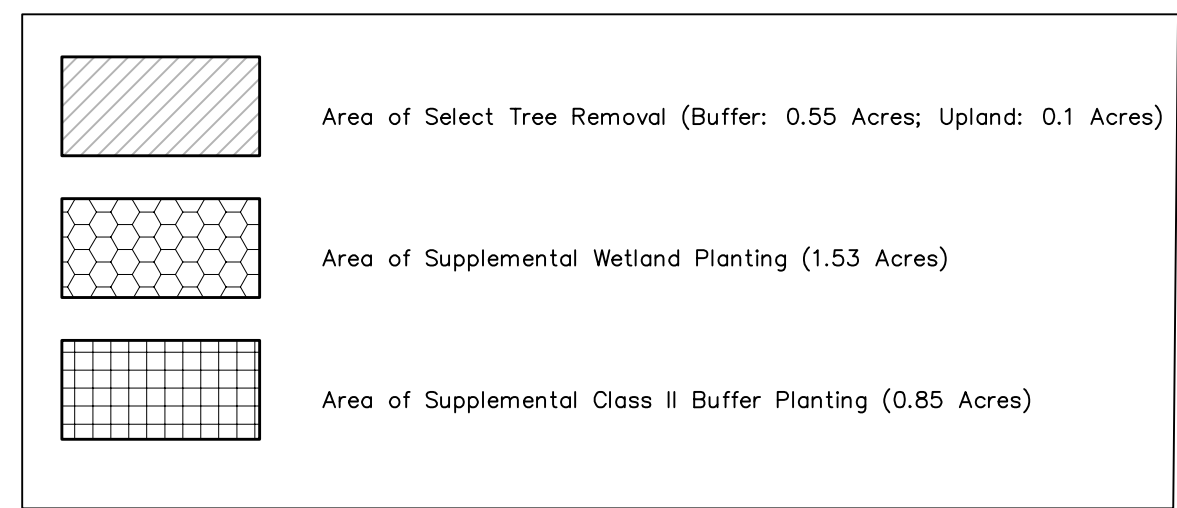
### BDE Grand Isle Solar LLC Allen Road Grand Isle, Vermont

No.	Revision	Date	Apprd.
1	Class II Wetland Buffer	1/11/2016	CJH
2	Revised Module/ANR Comments	5/23/2016	CJH
3	Design Changes in Wetland Buffer	10/17/2016	CJH

Designed by: JMD Checked by: CJH  
 Issued for: 248 Permit Filing Date: Nov. 24, 2015

Not Approved for Construction  
 Site Plan

Proposed Supplemental Plantings					
Class II Buffer - (300 Stems/ Acre)					
Scientific Name	Common Name	Height at 20 Years (ft)	Mature Height (ft)	Approximate Quantity of Each Species	Recommended Planting Size
<b>Planting Area B-A (18,000 S.F.)</b>					
<i>Cornus racemosa</i>	Gray Dogwood	6	10	31	18-24"
<i>Corylus cornuta</i>	Beaked Hazelnut	15	15	31	9-12"
<i>Viburnum acerifolium</i>	Maple-leaf Viburnum	6	6	31	9-12"
<i>Viburnum recrogritum</i>	Arrowwood	--	10	31	18-24"
Planting Area B-A Total Stems:				124	
<b>Planting Area B-B (19,200 S.F.)</b>					
<i>Cornus racemosa</i>	Gray Dogwood	6	10	33	18-24"
<i>Corylus cornuta</i>	Beaked Hazelnut	15	15	33	9-12"
<i>Viburnum acerifolium</i>	Maple-leaf Viburnum	6	6	33	9-12"
<i>Viburnum recrogritum</i>	Arrowwood	--	10	33	18-24"
Planting Area B-B Total Stems:				132	
<b>TOTAL # OF STEMS IN CLASS II BUFFER:</b>				<b>256</b>	
Class II Wetland - (300 Stems/ Acre)					
Scientific Name	Common Name	Height at 20 Years (ft)	Mature Height (ft)	Approximate Quantity of Each Species	Recommended Planting Size
<b>Planting Area W-A (16,900 S.F.)</b>					
<i>Alnus incana ssp. rugosa</i>	Speckled Alder	16	16	23	18-24"
<i>Cornus amomum</i>	Silky Dogwood	7	10	23	18-24"
<i>Cornus sericea</i>	Red-osier Dogwood	12	12	23	18-24"
<i>Salix bebbiana</i>	Bebb Willow	12	12	23	15-18"
<i>Spiraea tomentosa</i>	Steeplebush	4	4	23	12-15"
Planting Area W-A Total Stems:				115	
<b>Planting Area W-B (25,000 S.F.)</b>					
<i>Alnus incana ssp. rugosa</i>	Speckled Alder	16	16	34	18-24"
<i>Cornus amomum</i>	Silky Dogwood	7	10	34	18-24"
<i>Cornus sericea</i>	Red-osier Dogwood	12	12	34	18-24"
<i>Salix bebbiana</i>	Bebb Willow	12	12	34	15-18"
<i>Spiraea tomentosa</i>	Steeplebush	4	4	34	12-15"
Planting Area W-B Total Stems:				170	
<b>Planting Area W-C (24,800 S.F.)</b>					
<i>Alnus incana ssp. rugosa</i>	Speckled Alder	16	16	34	18-24"
<i>Cornus amomum</i>	Silky Dogwood	7	10	34	18-24"
<i>Cornus sericea</i>	Red-osier Dogwood	12	12	34	18-24"
<i>Salix bebbiana</i>	Bebb Willow	12	12	34	15-18"
<i>Spiraea tomentosa</i>	Steeplebush	4	4	34	12-15"
Planting Area W-C Total Stems:				170	
<b>TOTAL # OF STEMS IN CLASS II WETLAND:</b>				<b>455</b>	
<b>TOTAL # OF PROPOSED PLANTINGS:</b>				<b>711</b>	



**SUPPLEMENTAL PLANTING PLAN NOTES:**

SUPPLEMENTAL PLANTINGS ARE PROPOSED FOR THREE (3) CLASS II WETLAND (W-A, W-B, & W-C) AND TWO (2) CLASS II BUFFER (B-A & B-B) AREAS, AND WILL BE LOCATED ADJACENT TO THE ARRAY. ACREAGE OF EACH PLANTING AREA AND NUMBERS OF SPECIES IN EACH PLANTING AREA ARE LOCATED IN THE "PROPOSED SUPPLEMENTAL PLANTINGS" TABLE ON THIS PLAN.

THE TOTAL SUPPLEMENTAL PLANTING AREA IS 37,700 SQ. FT. (0.85 ACRES) OF BUFFER PLANTINGS, AND 66,700 SQ. FT. (1.53 ACRES) OF CLASS II WETLAND PLANTINGS, FOR A TOTAL OF 103,900 SQ. FT. (2.39 ACRES) OF SUPPLEMENTAL PLANTINGS.

THE PURPOSE OF THE PLANTING PLAN IS TO ENHANCE THE CONDITION AND FUNCTIONS OF THE ON-SITE WETLAND AND BUFFERS WHERE PLANTINGS WILL OCCUR, AND WHICH WERE PREVIOUSLY PART OF THE ON-SITE AGRICULTURAL OPERATIONS.

THE SUPPLEMENTAL PLANTING AREAS WILL NOT BE SUBJECT TO VEGETATION MANAGEMENT CUTTING, AND INCLUDES SHRUB SPECIES WHICH WILL BE VERY UNLIKELY TO CAUSE SHADING OF THE ARRAY.

PLANTING MATERIALS WILL BE COMMERCIALY AVAILABLE NATIVE PLANT MATERIALS FROM A NEW ENGLAND SOURCE.

ACTUAL SPECIES PLANTED SUBJECT TO SOURCE AND SEASON; STEM QUANTITY AND DENSITY MAY VARY ACCORDING TO AVAILABLE STOCK SIZE AND SITE CONDITIONS.

PLANTING WILL BE BY HAND, WITH NO FILL PLACED IN WETLAND. SHRUBS SHOULD BE PLANTED IN SAME-SPECIES GROUPS OF 3-5 STEMS.

PLANTING WILL OCCUR EITHER THE SPRING OR FALL FOLLOWING PROJECT CONSTRUCTION, DEPENDING ON CONSTRUCTION SCHEDULE (SPRING OR FALL TYPICALLY YIELD MORE FAVORABLE SOIL MOISTURE CONDITIONS FOR PLANTING AND ESTABLISHMENT, AND CAN THEREFORE MINIMIZE TRANSPLANT SHOCK).

PLANTINGS WILL BE INSTALLED USING A RECOMMENDED 12-FOOT SPACING BETWEEN STEMS, RESULTING IN AN APPROXIMATE 300 STEMS/ ACRE DENSITY, RECOMMENDED FOR A SHRUB-DOMINATED COMMUNITY.

SCIENTIFIC NAMES, AND APPROXIMATE HEIGHTS OF SPECIES FROM USDA, NRCS, 2016. THE PLANTS DATABASE (USDA, NRCS, 2016. THE PLANTS Database (<http://plants.usda.gov>, 13 April 2016). National Plant Data Team, Greensboro, NC 27401-4901 USA).

**PLANTING SPACING FROM GUIDANCE IN USDA NATURAL RESOURCES CONSERVATION SERVICE (NRCS). SPECIFICATION GUIDE SHEET FOR RIPARIAN FOREST BUFFER (391). AVAILABLE ONLINE: [HTTP://EFOTG.SC.EGOV.USDA.GOV/REFERENCES/PUBLIC/VT/VTSP391-9109.P](http://efotg.sc.egov.usda.gov/references/public/vt/vtsp391-9109.p)**

THE FINAL STEM DENSITY GOAL FOR THE SUPPLEMENTAL PLANTING AREAS IS 300 STEMS/ ACRE, WHICH IS RECOMMENDED BY THE USDA FOR SHRUB-DOMINATED COMMUNITIES WHICH ACT AS BUFFERS TO RIPARIAN SYSTEMS. THE PROJECT PROPONENT ANTICIPATES THIS GOAL WILL BE MET THROUGH A COMBINATION OF PLANTINGS AND NATIVE RECRUIT GROWTH. IN ORDER TO ENSURE THIS GOAL IS MET, THE PROJECT PROPONENT IS PROPOSING THE FOLLOWING MONITORING ACTIONS:

- THE SUPPLEMENTAL PLANTING AREAS WILL BE MONITORED FOR A PERIOD OF NO MORE THAN THREE (3) YEARS FOLLOWING THE COMPLETION OF CONSTRUCTION AND INSTALLATION OF THE WOODY STEMS.
- MONITORING WILL INCLUDE BOTH MONITORING THE STEM DENSITIES WITHIN THE SUPPLEMENTAL PLANTING AREAS, AND MONITORING THE "NO MOW" AREAS WITHIN THE CLASS II BUFFER. THE PURPOSE OF THE MONITORING WILL BE TO ENSURE WOODY STEM DENSITY GOALS ARE BEING MET; THE "NO MOW" ZONE OF THE CLASS II BUFFER IS NOT MOWED; AND TO ENSURE NO CORRECTIVE ACTION OR RECOMMENDATIONS ARE NEEDED TO ENSURE THE GOALS ARE MET.
- MONITORING FOR SHRUB STEM DENSITY WILL OCCUR THROUGH ESTABLISHING TEN (10) 5-METER DIAMETER PLOTS (EVENLY DISTRIBUTED THROUGHOUT THE SUPPLEMENTAL PLANTING AREAS) IN WHICH EACH STEM (BOTH PLANTED AND NATURAL RECRUIT) WILL BE TALLIED AND EXTRAPOLATED. THIS ANNUAL DATA COLLECTION WILL BE USED TO MAKE RECOMMENDATIONS ON CORRECTIVE ACTIONS IF NECESSARY (I.E. ADDITIONAL PLANTINGS).
- MONITORING WILL ALSO INCLUDE ESTABLISHING PERMANENT PHOTOGRAPH LOCATIONS (THROUGH GPS-LOCATION) THROUGHOUT THE SUPPLEMENTAL PLANTING AREAS AND THE "NO MOW ZONE" TO VISUALLY RECORD AND MONITOR ON-SITE CONDITIONS.
- AFTER YEAR THREE (3) MONITORING, THE PROJECT PROPONENT WILL PREPARE AND SUBMIT A MONITORING REPORT TO THE DEC WETLANDS SECTION (BY DECEMBER 31ST OF THE FINAL MONITORING YEAR). THE MONITORING REPORT WILL INCLUDE THE FOLLOWING:
  - A BRIEF SUMMARY OF THE PROJECT BACKGROUND;
  - A SUMMARY OF THE DEVELOPMENT OF THE SUPPLEMENTAL PLANTING AREAS;
  - A BRIEF DESCRIPTION OF THE CONDITIONS OF THE "NO MOW ZONES";
  - A SUMMARY OF THE WOODY STEM MONITORING RESULTS;
  - A DESCRIPTION OF ANY RECOMMENDATIONS AND CORRECTIVE ACTIONS UNDERTAKEN DURING THE MONITORING PERIOD;
  - AN OVERALL MAP SHOWING THE MONITORING AREAS (SUPPLEMENTAL PLANTING AREAS AND "NO MOW ZONES"; AND
  - A PHOTO LAYOUT OF THE MONITORING PHOTOGRAPHS.

**VEGETATION MANAGEMENT PLAN NOTES:**

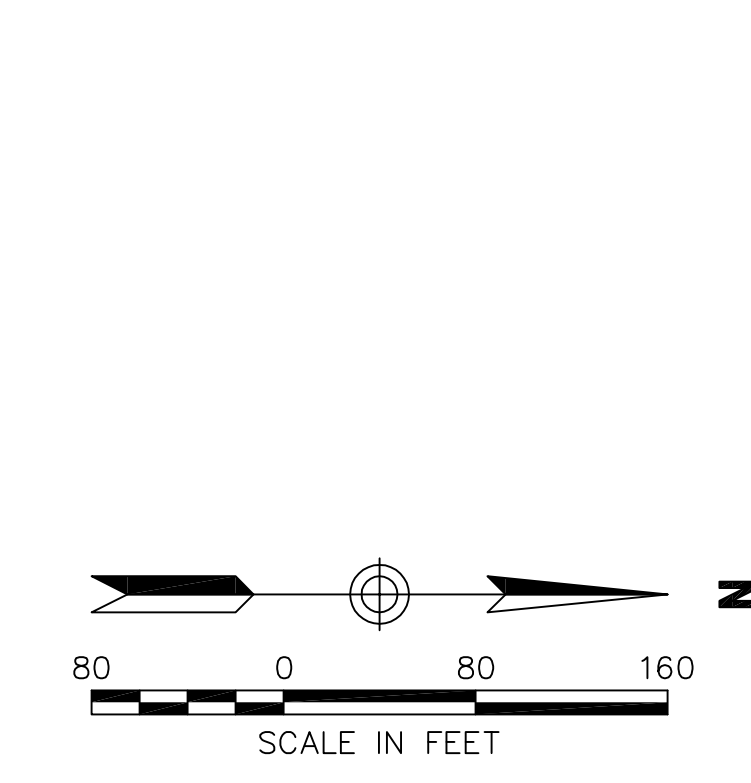
1. THE PURPOSE OF THE VEGETATION MANAGEMENT PLAN ("VMP") IS TO MINIMIZE SHADING AND LOSS OF ELECTRICITY GENERATION CAPACITY FROM THE PHOTOVOLTAIC ARRAYS, WHILE MAINTAINING NATURAL VEGETATION AS MUCH AS POSSIBLE TO PROTECT AND BUFFER IDENTIFIED SENSITIVE ENVIRONMENTAL RESOURCES.
2. THIS VMP APPLIES TO AREAS IDENTIFIED ON THE PLAN AS "AREA OF SELECT TREE REMOVAL" FOR INITIAL SHADE REDUCTION CUTTING AND APPLIES TO FUTURE SHADE MANAGEMENT CUTTING AS NECESSARY APPLICABLE IN THE BUFFER AREA INDICATED ON THIS PLAN, TO MAINTAIN CONDITIONS FOLLOWING INITIAL CUTTING. THIS PLAN ALSO DESCRIBES THE MEASURES THAT WILL BE USED TO MANAGE HERBACEOUS VEGETATION WITHIN THE FENCED IN ARRAY.
3. VEGETATION MANAGEMENT OUTLINED IN THIS PLAN IS TO OCCUR DURING PROJECT CONSTRUCTION, OR PRIOR TO COMMISSIONING OF THE ARRAY.
4. THE PROCEDURES OUTLINED IN THE CURRENT STATE OF VERMONT "ACCEPTABLE MANAGEMENT PRACTICES FOR PROTECTING WATER QUALITY ON LOGGING JOBS", OR SUBSEQUENT APPROVED GUIDANCE DOCUMENT, WILL BE FOLLOWED DURING TREE CUTTING ACTIVITIES.
5. TREES TO BE INDIVIDUALLY CUT USING NON-MECHANIZED EQUIPMENT FOR ACCESS TO AVOID SOIL DISTURBANCE, AND NON-NATIVE AND INVASIVE SPECIES SPREAD. TREE CUTTING IS LIMITED TO BETWEEN NOVEMBER 1 AND MARCH 31.
6. VEGETATION MANAGEMENT ACTIVITIES FOR SHADE MANAGEMENT WILL CONSIST OF CUTTING OR

7. CUT TREES MAY BE OFFERED TO THE PROPERTY OWNER AS FIREWOOD. OTHER WOODY MATERIAL TO BE EITHER BUCKED AND LEFT IN PLACE, USED FOR WILDLIFE HABITAT ENHANCEMENT FEATURES WITHIN THE ON-SITE BUFFERS, OR CHIPPED AND USED FOR MULCH.
8. EXISTING ELEVEN (11) TREE SPECIES THAT ARE ANTICIPATED TO BE SUBJECT TO SELECT TREE REMOVAL ARE SHOWN ON THIS PLAN, AND INCLUDE GREEN ASH (*FRAXINUS AMERICANA*), RED MAPLE (*ACER RUBRUM*), SUGAR MAPLE (*ACER SACCHARUM*), AND ELM (*ULMUS AMERICANA*). THE PORTIONS OF THE TREES THAT REMAIN WILL BE ALLOWED TO STUMP SPROUT AND WILL CONTINUE TO PROVIDE COVER AND STRUCTURE TO THE VEGETATIVE COMMUNITY.
9. HERBACEOUS VEGETATION MANAGEMENT IS ALSO NECESSARY TO PREVENT SHADING OF THE ARRAY. A CONSERVATION SEED MIX IS PROPOSED FOR SITE RESTORATION, WHICH WILL INCLUDE A MIX OF FAST-GROWING SPECIES FOR SITE STABILITY AND FLOWERING SPECIES FOR WILDLIFE.
10. THE AREA OF WETLAND BUFFER BETWEEN THE PERIMETER FENCE AND PANEL EDGE IS A "NO MOW ZONE". HOWEVER, IF WOODY SPECIES WITHIN THE PERIMETER FENCE BEGIN TO SHADE THE ARRAY TO AN UNACCEPTABLE DEGREE, THE SHRUBS MAYBE BE CUT TO AN ACCEPTABLE HEIGHT (TO NO LESS THAN THREE (3) FEET IN HEIGHT) IF THE CUTTING IS CONDUCTED USING NON-MECHANIZED MEANS.
- 11.

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**BDE Grand Isle Solar LLC**  
Allen Road  
Grand Isle, Vermont

No.	Revision	Date	Apprd
1	Class II Wetland Buffer	1/11/2016	CJH
2	Revised Module/ANR Comments	5/23/2016	CJH
3	Design Changes in Wetland Buffer	10/17/2016	CJH

Designed by JMD Checked by CJH  
Issued for 248 Permit Filing Date Nov. 24, 2015

Not Approved for Construction  
Vegetation Management Plan