Town of Richmond, Rhode Island
Town Hall, Wyoming, RI 02898

Application for Development Plan Review
Town of Richmond - Planning Board

Richmond Town Hall
5 Richmond Townhouse Road
Wyoming, RI 02898
401/539-9000 Ext. 6

Date: 4/16/18

Stage of Review: Development Plan Review

Applicant and Owner:

Applicant: GD Richmond Beaver River I, LLC Phone: (401) 295-4998

Address: 3760 Quaker Lane Town, State, Zip: North Kingstown, RI 02852

Owner (if the applicant is not the owner): William M. Stamp Jr, Trustee

Address: One Stamp Place Town, State, Zip: Exeter, RI 02882

Property Address (street number and street): 172 Beaver River Road

Assessor's Plat: 8E Lot Number: 12 Zoning District: R-3

Lot Area: 43.67+/- acres Dimensions of Lot or Parcel (in feet): 2,585' +/- (frontage on Beaver River Rd.) x 800' +/-deep at the widest

Size of Existing Building (s): 1,646 sf Size of Proposed Building (s): n/a, no buildings proposed

What if the present use of the property? Single family home and farm field

Please describe the proposed use of the property (use additional pages if necessary).
The single familiy home is in disrepair and is proposed to be razed as part of this project. The proposed use consists of a 5.25 MW AC (7.45 MW DC) solar array to be constructed within the existing field and the remaining field to remain as pature and/or hay fields. No clearing of existing wooded areas are proposed and a vegetated buffer along Beaver River Road is proposed.

Signature: I hereby attest that the information contained in this application is true to the best of my knowledge. By signing this application the applicant and owners of the subject property agree to allow the Planning Board and other Town Representatives to inspect the subject property.

Signature of Applicant: _____

Signature of Owner, if Applicant is not the owner: _____ TRUSTEE

Attorney for Applicant: John Mancini, Mancini Carter, PC, 56 Pine Street 3rd Floor Providence, RI 02903
(401) 343-7000 jmancini@mancinicarter.com

Engineer, Landscape Architect, Architect, and other Consulting Professionals for Applicant
(Please provide Rhode Island Registration and/or license numbers):
Civil Engineer - Kevin Morin, PE Green Development, LLC , 3760 Quaker Lane North Kingstown, RI 02852
(401) 295-4998, km@green-ri.com - PE License #7051
Landscape Architect - Don Leighton, BETA Group, Inc. 6 Blackstone Valley Place Suite 101 Lincoln, RI 02865
(401)333-2382, DLeighton@BETA-Inc.com - RLA #0133
Surveyor - Norbert Therien, PLS , National Surveyors -Developers, Inc. 42 Hamlet Avenue Woonsocket, RI
(401) 769-7779; nationalsurvey@nlsdi.necoxmail.com; PLS # 1739

APPLLICATION FEES: All submissions for Development Plan Review shall be accompanied by a fee per 18.54.050. The fees shall be assessed as follows:

Pre-application conference before the Planning Board is $350.

Development Plan Review application fee is $350 plus $100 for each 5,000 square feet of land to be developed. The maximum total application fee, excluding the fee for a pre-application conference, shall not exceed $3000.

Project review fees for professional technical review shall be paid by the applicant. Project review fees are governed by section 11.3.2 of the land development and subdivision regulations.

APPLICATION SUBMISSION: Application packages must be received at least twenty-one (21) days in advance of the Planning Board meeting at which a site plan is to be presented.

The application and eleven (11) copies of the application and the information detailed in **Chapter 18.54** of the Richmond Zoning Ordinance must be submitted as required to the clerk of the Planning Board.

APPLICATION NOTIFICATION LIST

Please list the **name, address, phone number(s), and email** for each person who represents your application who requires notification of meetings or correspondence regarding actions.

Date: 4/17/18 **Project Name:** GD Richmond Beaver River I

Plat/Lot 8E/Lot 12 **Address/Street** 172 Beaver River Road

Applicant: GD Richmond Beaver River I, LLC

Address 3760 Quaker Lane North Kingstown, RI 02852

Phone 401-295-4998 Email md@green-ri.com

Owner (if different than applicant): William M. Stamp Jr., Trustee

Address One Stamp Place Exeter, RI 02882

Phone 401-742-4454 Email stamp866@verizon.net

Attorney: Mancini Carter PC

Address 56 Pine Street, 3rd Floor Providence, RI 02903

Phone 401-343-7000 Email jmancini@mancinicarter.com

Engineer: Kevin Morin - Green Development, LLC

Address 3760 Quaker Lane North Kingstown, RI 02852

Phone 401-295-4998 Email km@green-ri.com

Surveyor: National Surveyors-Developers, Inc.

Address 42 Hamlet Avenue Woonsocket, RI 02895

Phone (401)769-7779 Email nationalsurvey@nlsdi.necoxmail.com

Architect: n/a

Address

Phone Email

Landscape Architect: BETA Group, Inc. - Don Leighton

Address 6 Blackstone Valley Place Suite 101Lincoln, RI 02865

Phone (401)333-2382 Email DLeighton@BETA-Inc.com

Other Representatives Requiring Notification:

Name

Address

Phone Email

OWNER'S AUTHORIZATION

Town of Richmond, Rhode Island
APPLICATION FOR APPROVAL
OF SUBDIVISION OR LAND DEVELOPMENT PROJECT

I am the owner of the property designated as:

Lot(s) ....12..... on Assessor's Plat ..8E.....

I authorize submission of the application for subdivision or land development approval to the Richmond Planning Department.

I further authorize officers and employees of the Town of Richmond, including the Administrative Officer and members of the Planning Board, to enter on to the above property at reasonable times with prior notice while the application is pending.

SIGNATURE: [signature] TRUSTEE DATE: 4/18/18

PRINT NAME: William M Stamp Jr. TRUSTEE

STATE OF RHODE ISLAND
COUNTY OF WASHINGTON

In Richmond, on the ...18.. day of .....April..... , 20.18., before me personally appeared .....William Stamp....., known to me known and known by me to be the party executing the foregoing instrument, and he/she acknowledged said instrument, by him/her executed, to be his/her free act and deed.

KADY ADAMS
Notary Public, State of Rhode Island
My Commission Expires Feb. 26, 2022

NOTARY PUBLIC
Print name: Kady R Adams
My commission expires: 2/26/22

If the owner of the property is a business entity:

NAME OF BUSINESS:

TITLE OF PERSON
SIGNING THIS AUTHORIZATION:

STATE OF RHODE ISLAND
COUNTY OF WASHINGTON

In Richmond, on the ..... day of ....., 20....., before me personally appeared ....., known to me known and known by me to be the party executing the foregoing instrument, and he/she acknowledged said instrument by him/her executed, to be his/her free act and deed personally and in his/her capacity as .... of ..... .

NOTARY PUBLIC
Print name:
My commission expires: / /

H. DEVELOPMENT PLAN REVIEW CHECKLIST

Use this checklist to prepare an application for approval of a development plan under Ch. 18.54 of the Zoning Ordinance.

A. Application contents. The application shall contain the following items in addition to the development plan:

1. x Application form for development plan review.

2. x Application notification list.

3. x Owner's authorization form, if applicable.

4. x Filing fee (Zoning Ordinance Sec. 18.54.050).

5. n/a Project review fee deposit, if required (Sec. 11.3.2). TBD if needed

6. x Fifteen copies of a general description, in narrative form, of the physical characteristics of the property, the current use of the property, and the proposed use of the property.

7. x Supplemental information. see transmittal for full submission materials

The Planning Board has the authority to request additional information if the information is necessary to determine that the development plan satisfies the requirements of Chapter 18.54 of the Zoning Ordinance and the Comprehensive Community Plan.

B. Preparation of plan.

The plan shall be prepared at a scale of 1 inch = 40 feet unless the Administrative Officer authorizes a different scale. The number of sheets shall be sufficient to show all the information required. Sheets shall be numbered consecutively. Six full-size and fifteen reduced-size 11-by-17-inch copies shall be submitted. The Planning Board or the Administrative Officer may ask that the plan be submitted in a digital format.

The plan must include a stamped certification by a professional land surveyor that perimeter lot lines and street lines conform to the standards for a comprehensive boundary survey and Class I measurement standard in the current R.I. Rules and Regulations for Professional Land Surveying.

Each set of plans shall include the following information on every sheet:

1. x Name of the project or development.

2. x Name and address of the property owner(s) and the applicant(s).

3. x Name, address, and telephone number of person or firm who prepared the plan.

4. x Date of plan preparation, with revision date(s).

5. x Graphic scale and true north arrow.

C. Contents of plan: The plan shall show the property being developed and all property within 500 feet. The following information shall be shown:

1. x Lot boundaries and zoning district boundaries.

2. x Plat and lot numbers.

3. x Names of owners of property adjacent to and across the street from the property.

4. n/a Easements of record, including rights of way.

5. x Natural features including topography at ten-foot intervals, soil types, vegetation patterns including large stands of trees and specimen trees, wetlands, bodies of water and watercourses, and rock outcrops and ledge.

6. x Footprints of existing and proposed structures.

7. x Existing and proposed streets, pedestrian walkways, parking areas, and other impervious areas. No streets proposed, the internal access driveway is shown as well as concrete pads for electrical eqiupment

8. n/a Cross sections of proposed streets. Note: not streets proposed but the access driveway cross section is shown

9. x Existing and proposed utility lines, water mains, valves and hydrants, wells, and onsite wastewater treatment systems.

10. x Existing and proposed site improvements including retaining walls and fences. No walls proposed

11. x Outdoor storage. Note on plan

12. x Grading plan including extent and amount of cut and fill for all disturbed areas, and before-and-after profiles of typical development areas, parking lots and roads.

13. x Proposed stormwater management system. No cuts or fills associated with proposed solar, existing grade to be folllowed

14. x Landscaping plan, including a list of plant material.

15. x Location of proposed outdoor lighting. None proposed, note on plan

16. x Location, size, color and illumination of proposed signs. No signeage proposed except as rquired by national grid / electrical code for warnings

17. x The gross floor area, in square feet, of all structures on the parcel, and the area, in square feet, of all non-structural land development, including but not limited to parking areas, landscaped areas, and stormwater management facilities.

18. n/a Proposed building elevations and architectural renderings. No buildings proposed

19. For development in the Industrial, Light Industrial, and Flex Tech zoning districts:

a. n/a The specific uses proposed.

b. n/a Type of power to be used for any manufacturing process.

c. n/a The type of wastes or by-products to be produced by any manufacturing or processing operations, and the proposed method of disposal of such wastes or byproducts.

D. Supplemental information.

1. x A list of the state and federal permits required for the development.

2. n/a If Town Council approval of a zoning ordinance amendment is necessary to construct the land development project, a copy of the amended ordinance section(s).

3. n/a If connection to a public water supply is proposed, written confirmation that the engineer for the appropriate water company or district has reviewed the plan and that the district is able to provide water service.

4. x For advisory development plan review, a complete copy of the application for which an opinion is requested.

E. Plan to be recorded.

The applicant shall submit to the Administrative Officer One Mylar®, five paper copies, and one digital copy of the approved plan. Each sheet that will be recorded shall include a recording block for the Town Clerk and a signature block for the Planning Board Chairman or Secretary. Recording fees must be paid to the Town Clerk when the plan is recorded.

(Amended 4/25/17)

System Impact Study
for Distributed Generation Interconnection to
National Grid's 12.47 kV System

DG WR:	RI-25078252
Applicant:	Green Development, LLC
Address:	172 Beaver River Road
City:	Richmond, RI 02892
DG kW/kVA:	5,250 kW / 5,250 kVA
DG Type:	Inverter-Based Photovoltaic.
Feeder:	Kenyon 68F1

Table of Contents

Section **Page**

List of Tables

Table **Page**

Definitions

The following is a list of acronyms/synonyms used in this Interconnection Study:

Company – National Grid

Customer – The interconnecting customer of this project

DG – Distributed Generation

DTT – Direct Transfer Trip

EPS – Electrical Power System

ESB – National Grid's Electrical Service Bulletin

Facility – The distributed generating facility for this project, including all related appurtenances and equipment.

IA – Interconnection Application

Interconnecting Circuit – Circuit to which the Facility will connect

ISA – Interconnection Service Agreement

ISO-NE – Independent System Operator of New England

NPCC – Northeast Power Coordinating Council

PCC – Point of Common Coupling (point of demarcation between the Customer and Company facilities)

Project – The interconnection of the Facility to the Company electrical power system.

Executive Summary

The Company has completed the Impact Study, for the interconnection of Green Development, LLC ("Customer") 5,250 kW AC, inverter-based photovoltaic system ("the Facility"), to its 12.47 kV distribution system, ("the Project"), and presents the conclusions of the study herein.

The interconnection requirements specified are exclusive to this project and are based upon the most recent information submitted by the Customer, which is attached for reference in Appendix C. Any further design changes made by the Customer post IA without the Company's knowledge, review, and/or approval will render the findings of this report null and void.

In general, the Project was found to be feasible with certain modifications to the existing Company EPS and operating conditions, which are described in detail in the body of this Study.

System Modifications

In general, the Project was found to be feasible with certain modifications to the existing Company System and operating conditions, which are described in detail in the body of this Study. Significant modifications include:

1. Build ~3,400' of new three-phase 3-477 AAC spacer primary from pole # 46 South County Trail, along Shannock Hill Road and Beaver River Road. Transition to ~1,600' of 3-477 AAC crossarm configuration on Beaver River Road until the DG tap at or near pole # 45 Beaver River Road.
    - Install a disconnect switch at proposed pole # 1 Shannock Hill Road
    - Install a recloser at proposed pole # 2 Shannock Hill Road, equipped with live-line reclose blocking
    - Install a 3-10 kVA transformer bank at proposed pole # 3 Shannock Hill Road to provide load-side voltage sensing to the recloser at proposed pole # 2.
2. Install a disconnect switch at proposed pole # 45-1 Beaver River Road
3. Install a recloser at proposed pole # 45-2 Beaver River Road
4. Install a primary meter at proposed pole # 45-3 Beaver River Road
5. Install a disconnect switch at pole # 22-50 South County Trail
6. Install a recloser at pole # 22 South County Trail
7. Replace recloser at pole # 2-50 Kingstown Road
8. Install a disconnect switch at pole # 3 Kingstown Road
9. Adjust control settings for the capacitor bank at pole # 72 Usquepaugh Road
10. Adjust recloser settings at pole # 1 Usquepaugh Road
11. Adjust recloser settings at pole # 49 South County Trail
12. Adjust 68F1 breaker settings (primary & backup)
13. Install a 3V0 protection scheme on TR1 and TR2 at Kenyon Substation

Customer Document Revisions

The Customer is requested to provide the following additional and/or revised documentation as required. All revised drawings shall be stamped and signed by an Electrical Professional Engineer licensed in the same state as the Project location. The following list is intended as a convenient summary of documents

for re-submission, however the Customer is required to comply with all items listed and discussed in this document. Omission of an item from the following summary list that is referenced elsewhere in this document does not release the Customer from providing the necessary documents:

1. Customer has not provided an inverter manufacturer letter certifying compliance with ESB756D Section 10.3 (Section 3.4).
2. If not already in place, the Customer shall provide a telecommunication line to the Company's revenue meter (Section 6.2).
3. Customer's proposed overcurrent relay elements are not acceptable as shown (Section 6.8.4)
4. Customer's proposed current transformers are not acceptable as shown (Section 6.9).
5. Customer's proposed under-frequency protection is not acceptable as shown (Section 6.12).

Cost Estimate

Refer to the Cost Estimate table in Section 9.0 for a listing of major modifications and associated costs. The total estimated planning grade cost of the work associated with the interconnection of the Facility, is $1,314,159 +/-25% and includes Company EPS modifications, Customer interconnection, and taxes. An estimated construction schedule will be provided in the Interconnection Service Agreement. Applicable cost sharing allocations, if any, will be calculated by the Company and provided in the Interconnection Service Agreement.

1.0 Introduction

The Customer has requested interconnection of a Facility to the Company's existing infrastructure.

The analysis utilized Customer provided documentation to examine the effects on the Company system when the new Facility is connected. The results identify required modifications to the Customer one line diagram(s) and Company infrastructure in order to accommodate the interconnection. As such, the interconnection of the Facility has been evaluated under specific conditions. Should the Customer make any changes to the design, other than those identified in this study, it may require additional time for review, and possibly additional cost.

In accordance with the R.I.P.U.C. No. 2163 tariff and the Company's ESB series, the Company has completed an Impact Study to determine the scope of the required modifications to its EPS and/or the Facility for providing the requested interconnection service.

Analysis will be performed in accordance with applicable reliability standards and study practices, and in compliance with the applicable codes, standards, and guidelines listed in the Company's *Electric System Bulletin No. 756 Appendix D: Distributed Generation Connected to National Grid Distribution Facilities Per The Rhode Island Standards for Interconnecting Distributed Generation ("ESB756D")* to determine the incremental impact and any potential adverse impacts associated with the interconnection of the Facility to the EPS.

2.0 Project Description

2.1 Customer Facility

The Customer proposes to install the following:

- Customer owned 5,250 kW of inverter based DG via nine (9) 500 kW Solectria XTM-500 inverters and one (1) 750 kW Solectria XTM-750
- Four (4) Customer owned 1,000 kVA, 12.47 kV wye-grounded primary / 380 V delta secondary / 380 V delta tertiary three-winding interface transformers, each with a neutral grounding reactor (Size TBD). Zhx = 5.75%, Zhy = 5.75%, Zxy = 10.5%, X/R = 6.0
- One (1) Customer owned 750 kVA, 12.47 kV wye-grounded primary / 380 V delta secondary two-winding interface transformer, with a neutral grounding reactor (Size TBD). Z = 5.75%, X/R = 5.0
- One (1) Customer owned 500 kVA, 12.47 kV wye-grounded primary / 380 V delta secondary two-winding interface transformer, with a neutral grounding reactor (Size TBD). Z = 5.0%, X/R = 3.0

- One (1) Customer owned G&W Viper recloser integrated with an SEL-651R relay
- One (1) Customer owned lockable group-operated air-break switch

A copy of the Customer one lines are provided in Appendix C, illustrating the Customer's proposed design and proposed interconnection to the area EPS. The Customer documents are not binding, and shall require modifications and/or clarification as identified herein.

The following parameters were assessed as part of the Project evaluation:

1. The voltage and frequency trip settings as shown on the one line (dated 12/21/2017).

Any advanced inverter functionality other than that specifically called out on the Customer documentation and/or outlined herein shall be subject to additional study before being enabled.

2.1.1 Assumptions

For certain components, data was not provided by the Customer, or was physically not available at the time of this Study. In order to proceed with the analysis certain assumptions were made based on past experience and engineering judgment. Assumptions are summarized in the following list. Should any of these assumptions be incorrect, the Customer must advise the Company immediately, as reevaluation of the Impact Study results may be required:

1. 50' of 3-1/0 aluminum crossarm overhead conductor and 225' of 250 MCM aluminum underground cable between the Customer meter and first interface transformer.

2.2 Company Area EPS

The area EPS was evaluated and it was determined that the most viable interconnecting circuit is 68F1 a 12.47 kV regulated, three-phase, 4 wire, wye, effectively-grounded, radial distribution circuit that originates out of the Company's Kenyon substation, in Charlestown, RI (the "Interconnecting Circuit"). The feeder is regulated by way of a feeder voltage regulator at the substation. This circuit is located immediately adjacent to the Facility, via single-phase overhead primary on Beaver River Road. The Facility is approximately 5,400' from the 68F1 mainline.

The ability to generate is contingent on this Facility being served by the Interconnecting Circuit during normal operating conditions. Therefore, if the Interconnecting Circuit is

out of service, or if abnormal operating conditions of the area EPS are in effect, the Company reserves the right to direct the Customer to disengage the Facility.

The Interconnecting Circuit has the following characteristics:

- Refer to Section 3.0 for circuit loading characteristics.
- The existing and in-process generation at the substation and on the interconnecting circuit is summarized in Table 1. Values shown are based on full nameplate DG output. :

Feeder	Generation installed and operating at time of study (kW)	Generation in process at time of study (kW)	Generation proposed for this Project (kW)	*TOTAL* (kW)
68F1	256.92	2238.46	5250	*7745.38*
68F2	278.985	45.2	0	*324.185*
68F3	235.415	30.04	0	*265.455*
68F4	562.15	9371.02	0	*9933.17*
68F5	264.7	4400	0	*4664.7*
TOTAL	*1598.17*	*16084.72*	*5250*	**22932.89**

Table 1: Generation at the Substation and Interconnecting Circuit

- There are three existing reclosers on the circuit, all of which are downstream of the Facility. Refer to Section 5 for further discussion on any required modifications.

Location	Status	Mid-line recloser, or existing DG project PCC recloser	In between Facility and Substation
P1 Usquepaugh Road	In Service	Mid-line	No
P49 South County Trail	In Service	Mid-line	No
P2-50 Kingstown Road	In Service	Mid-line	No

Table 2: Recloser Locations

- There is a total of 4,700 kVAR in existing capacitor banks installed on this circuit. Refer to Section 3 for further discussion on any required modifications.

Location	Size (kVAR)	Type	Control	Status
P79 S County Trail	600	Fixed	N/A	In Service
P71 S County Trail	600	Switched	Time w/ VO	In Service
P43 Kingstown Road	900	Fixed	N/A	Offline
P84 Kingstown Road	600	Switched	Time w/ VO	In Service
P27 S County Trail	600	Switched	Time w/ VO	In Service
P72 Usquepaugh Road	600	Switched	Time w/ VO	In Service
P23 Glenrock Road	600	Switched	Time w/ VO	Offline; Recently Removed
P106 Gardiner Road	200	Fixed	N/A	In Service

Table 3: Capacitor Locations

- There is one set of existing regulators installed on this circuit. Refer to Section 3 for further discussion on any required modifications.

Location	Status
Kenyon 68F1	In Service

Table 4: Regulator Locations

2.3 Interconnection

Refer to the interconnection diagram in Appendix B for approximate PCC location.

Should the Customer elect to move forward with the Project, the Company's Design Personnel will specify the exact location of the Company's facilities and installation details. The Customer shall be responsible for obtaining all easements and permits required for any line extension not on public way in accordance with the Company's requirements.

The Customer shall provide unencumbered direct access to the Company's facilities along an accessible plowed driveway or road, where the equipment is not behind the Customer's locked gate. In those cases where Company equipment is required to be behind the Customer's locked gate, double locking, with both the Company's and Customer's locks shall be employed.

For this Project, the PCC is defined as pole # 45-3 Beaver River Road; the point where the Customer owned conductors terminate to the Company revenue meter. The Customer must install their facilities up to the Company revenue meter. The Customer must provide sufficient conductor to allow the Company to make final connections at the meter pole. The Company will provide final connection of the Customer conductors to the Company meter.

If National Grid right of way (R.O.W) is involved, then the Customer shall provide detailed drawings of any planned construction within any National Grid R.O.W., for the Company's review and subsequent approval, showing elevation grades of all phases of construction within the R. O. W. before any construction may begin. Plans and drawings must be submitted that meet all the Company's requirements before the interconnection process can move forward. These plans shall be submitted to National Grid's R.O.W./Real-Estate group and the Transmission R.O.W. Engineering and construction group for review and comment before any construction can be allowed to move forward. There may be additional costs and subsequent delays involved with the review, and, or oversight of any construction in, or adjacent to, the Company's R.O.W., and if any Company owned facilities need modification as a result of the Customer's proposed construction. These costs will be in addition to, and outside of the scope of, this SIS. Failure of the Customer to reimburse the Company for these costs may delay or negate the interconnection process.

3.0 Power Flow Analysis

The power flow analysis was substantially performed using electrical system modeling software. A model of the Interconnecting Circuit, as described in Section 2.2, was developed based on data extracted from the Company's Global Information System ("GIS"). A field review of the feeder was performed on January 3rd, 2018.

The analysis considered cases at peak load (6,958 kVA @ 99.2% Leading PF) and net minimum load (2,840 kVA @ 86.1% Leading PF) at time of maximum expected generation (9:00AM – 6:00PM) on the circuit.

Circuit peak and minimum load values have been taken from the Company's historical load data that has been compiled over the past 12 months, from January 2017 to January 2018.

3.1 Power Flow Pre-Existing Conditions

A preexisting high voltage condition appears on Kingstown Road, during minimum feeder loading conditions. The proposed Facility had no observable impact on the aforementioned area. The issue has been discussed with the Company's Long Term Planner/Field Engineer for the area. To remedy the issue, previous DG impact

studies are proposing actions to alleviate the issue. Implementation of the proposed changes are currently in progress.

This pre-existing condition is not expected to have an effect on the cost or schedule for this Project.

3.2 Reverse Power Flow at Substation

The possibility of the Facility causing reverse power flow through the Company's substation transformer was reviewed.

Analysis shows that the maximum potential generation exceeds the observed minimum load on TR1. However, the substation is currently equipped with bi-directional metering, which was previously installed for reasons unrelated to DG work. This Customer is not responsible for costs related to the existing metering.

No changes are required on the 68F1 station regulators, as the existing settings are adequate despite the added reverse power generated by the Project.

3.3 Interconnecting Circuit Load Flow Analysis

The area EPS was examined with and without the Facility operating at full output. The analysis demonstrated that the addition of the Facility will not create thermal loading problems on the Interconnecting Circuit, or the associated substation.

Specifically, no conductor, transformer, or voltage regulator overloads occur as a result of this interconnection. All Company owned mainline conductor and distribution facilities are thermally large enough to accommodate the proposed generation.

3.4 Interconnecting Circuit Voltage Analysis

The Company is obligated to hold distribution voltages at customer service points to defined limits in ANSI Standard C84.1- 2006. Range A of the ANSI standard requires the Company to hold voltage within +/- 5% of nominal at the PCC.

Under emergency conditions, voltage on the system could reach 90% of nominal prior to corrective action being taken. The Customer is advised to consider this in planning their system requirements and equipment settings, however, no warranties or guarantees are implied.

Under normal operating conditions it is expected that the Company will be able to meet its obligations for ANSI C84.1 with the system generation at full power. The Customer must maintain voltage at the PCC at +/- 5% of nominal under normal

conditions. Also, the PV interconnection shall not contribute to greater than a 3.0% change in voltage on the EPS under any conditions.

The analysis of this facility determined that when the Facility generation is at full output, the voltage range at the PCC was within acceptable limits.

The effect of existing capacitor banks and voltage regulators on the Interconnecting Circuit was evaluated. Results show that capacitor modifications will be required, as follows:

1. Adjust the control settings for the capacitor bank at pole # 72 Usquepaugh Road. This alleviates low voltage concerns on Hoxsie Road during peak daytime loading, caused by droops in output from the Facility.

These modifications are required as a direct result of this Project; therefore the Customer is responsible for the associated cost. Costs are identified in Section 9 of this Impact Study.

Due to potential high generation to load ratios on the feeder and possible Load Rejection Over Voltage (LROV), the Customer must provide details, documentation, and any factory tests or pre-certifications for the mitigation of this condition. The Company reserves the right to request additional equipment on the Customer's Facility if required and/or Over Voltage set point or a modification of an existing setting to mitigate this condition. The clearing/de-energization time must satisfy the Transient Over Voltage Tolerance Curve in Figure 1.

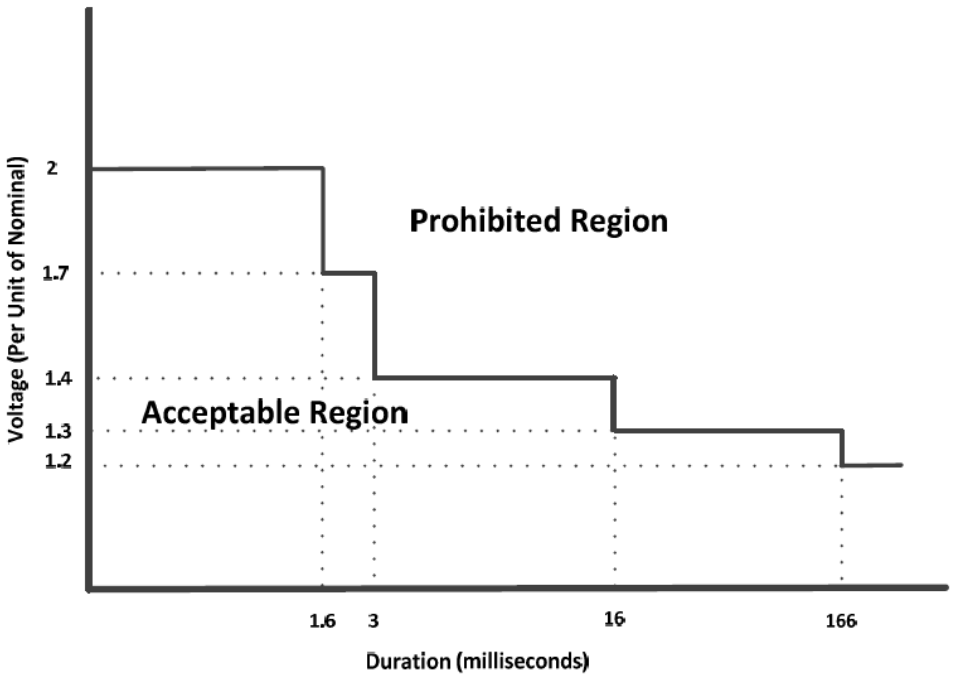


Figure 1: IEEE Transient Over Voltage Tolerance Curve

The Company will not be held liable for any power quality issues that may develop with the Customer or any other customers as result of the interconnection of this generation.

Most inverters have a 'self-protective overvoltage' setting in the inverters that, if enabled, is capable of tripping for no higher than 1.4pu voltage in 1ms or less clearing time. This set point is acceptable to meet the requirements if a letter from the inverter manufacturer is provided to the Company stating that this setting (or tighter) is enabled in the inverters to be installed on the site, and the inverter voltage response adheres to the curve in Figure 1. The letter shall be on the manufacturer's letterhead and include the firmware version and serial numbers of each inverter for the installation. Test data and/or standards certification supporting these statements may also be required at the discretion of the Company.

3.5 Flicker Analysis

The IEEE Recommended Practice for Measurement and Limits of Voltage Fluctuations and Associated Light Flicker on AC Power Systems, IEEE Std. 1453-2004 was used as a basis for flicker and voltage fluctuation analysis.

This Facility was modeled using the Long Term Dynamics module of CYME[1]. A long term dynamic profile for the Facility was used that simulates the voltage fluctuation of the site over a 6 hour period. Other significant DG existing or in process ahead of this Project were modeled at full output, and modeled with the appropriate voltage fluctuation curve to simulate normal cloud passage.

The long term dynamic DG profile used is based on live metered data from a PV site that is similar in size to this Project. The data is intended to simulate a typical day with cloud cover passing over the site, resulting in a varied output from the PV.

Given the nature of flicker, it is impossible to predict the true Facility fluctuation and results of how this Facility will interact with other DG on the circuit under all conceivable environmental conditions. Therefore, the flicker results are used as a metric to evaluate whether or not there is a readily apparent concern related to voltage flicker.

The Company will not be held liable for any power quality issues that may develop with the Customer or any other customers as result of the interconnection of this generation.

[1] CYME Power Engineering Software, Version 7.1, Revision 02, Build 99, Copyright © 1986-2014, Cooper Industries, Ltd.

Analysis shows that the predicted flicker and voltage fluctuations are expected to be acceptable, provided that the following conditions are met:

- The system modifications identified elsewhere in this study are implemented
- The reactive contribution of the PV at the PCC operates at 100% power factor or between 100 and 99% leading (importing VARs).

4.0 Risk of Islanding

4.1 Islanding Analysis (ESB 756D Section 7.6.12)

The project was screened for the potential of islanding risk. Per IEEE 1547 *section 4.4.1 Unintentional Islanding*, for an unintentional island in which the DG energizes a portion of the Area EPS through the PCC, the DG interconnection system shall detect the island and cease to energize the Area EPS within two seconds of the formation of an island.

The DER is 5,250 kW, which falls under the ESB 756C Section 7.6.12.3.4 (DER rated greater than, or equal to, 1,000 kW). Since the aggregate DER is greater than 50% of the minimum load, the following is required:

- Equip the proposed recloser at pole # 2 Shannock Hill Road with live-line reclose blocking

The documentation from the Customer regarding the proposed inverter's anti-islanding algorithm was reviewed. The proposed inverter's algorithm provides sufficient functionality to meet the Company's requirements for accurate detection of islands when interconnected with the subject feeder.

Based on known in-service and in-progress projects at the time of study, the generation shown in Table 5 was considered on this feeder. Three-phase projects greater than 25kW are listed individually. All other projects below 25 kW are listed as a single line item.

Project Size (kW)	Inverter Manufacturer	Inverter Model
5,250	Yaskawa/Solectria	SGI XTM-500, SGI XTM-750
351.38	All Projects <25kW Miscellaneous	All Projects <25kW Miscellaneous
216	Yaskawa/Solectria	PVI 36TL
216	Yaskawa/Solectria	PVI 36TL
216	Yaskawa/Solectria	PVI 36TL
216	Yaskawa/Solectria	PVI 36TL
216	Yaskawa/Solectria	PVI 36TL
216	Yaskawa/Solectria	PVI 36TL

216	Yaskawa/Solectria	PVI 36TL
216	Yaskawa/Solectria	PVI 36TL
216	Yaskawa/Solectria	PVI 36TL
200	Yaskawa/Solectria	PVI 50TL

Table 5: Generation Considered for Risk of Islanding Analysis

The analysis assumes that the active islanding detection proposed is enabled in the inverters. The Customer shall provide documentation from the manufacturer that the inverters are factory set to enable the active islanding detection, and this setting in the inverters cannot be changed except by the manufacturer. The Customer shall provide details on the method to field verify that the active islanding detection function is enabled for the witness test.

The findings from the impact study regarding risk of islanding are based on the Customer's specific design criteria, the Company feeder electrical characteristics, and this Project's queue position relative to other projects on the feeder at the time of study. Should this Customer change any element of the design and/or equipment specifications of the Project, the Customer's site is subject to re-evaluation by the Company, and may result in additional cost and/or the customer losing their original queue position. The Customer shall be aware that any such changes to their design and the subsequent re-evaluation of the project may affect the need for DTT.

Refer to Section 2.1 for specific functionality proposed by the Customer that was considered in the analysis.

4.2 Direct Transfer Tripping

A DTT system is not required for this interconnection, discussed in Section 4.1.

5.0 Short Circuit and Protection Analysis Company Facilities

The Company performed a review of the Project relative to the short circuit and protective device impacts on the Interconnecting Circuit. This review identifies EPS enhancements that are necessary to complete the Project and its ability to meet Rhode Island RIPUC 2163 interconnection tariff and the requirements of the Company's ESB 756D. The Interconnecting Circuit, including all relevant DG was modeled in a software package called ASPEN OneLiner[2]. The model was developed using Company records for feeder characteristics, and Customer provided documentation. Refer to Section 2.1.1 for any assumptions made in the model.

[2] ASPEN OneLiner V12.5, Build: 19177 (2015.01.28), Copyright © 1987-2013 ASPEN.

5.1 Fault Detection at Substation

Addition of generation sources to distribution feeders can result in the backfeeding of the substation transformers, effectively turning a station designed for load into a generation step-up transformer. The Company's typical 115kV-15kV class substation transformer has a delta connection on the transmission side and wye-grounded connection on the distribution side. Due to the transformer's configuration, it cannot contribute zero sequence ground fault current to single line to ground faults on a transmission line, and the voltage on the unfaulted phases rises significantly and rapidly. These overvoltages have potential to exceed insulation levels of the station and transmission line equipment, and maximum continuous operating voltage of surge arresters. Zero sequence voltage protection (commonly referred to as "$3V_0$") on the primary side of the transformer is required in order to detect these overvoltage conditions. This $3V_0$ protection will disconnect the generation from the substation transformer, and stop the generation and transformer from contributing to the transmission-side overvoltage condition.

Detailed analysis was completed to determine whether the interconnection of the Facility, in conjunction with existing connected facilities, may pose significant risk of causing temporary over-voltage conditions to develop on the system during line to ground faults on the high side of the substation transformer. The load to generation match at the substation has been evaluated assuming minimum load, maximum generation, and one feeder out of service in order to determine if substation modifications are required.

For this Project, results indicate that the Facility poses a significant risk of causing temporary overvoltage to develop on the primary side of the TR1 and TR2 substation transformers. Consequently, $3V_0$ will be required at the substation's TR1 and TR2, 115 kV delta – 12.47 kV Grd-Y, supply transformers.

It is not possible for the Customer to reduce to a lower Project size in order to avoid $3V_0$.

5.2 PCC Impedance

The Interconnecting Circuit impedance is shown below in per unit at the PCC for the proposed Facility, using a 100 MVA base. The PCC location is shown in Appendix B. These values take into account existing system conditions, but not the impact of the Customer's new Facility.

Pre-Project

System Impedance at PCC

Z1 = 0.45 + j1.64 p.u.

Z0 = 2.18 + j4.99 p.u.

5.3 Fault Current Contributions

Table 6 summarizes the Facility's effect on fault current levels at the PCC. Mitigation strategies are required to accommodate the proposed Facility, as described in Sections 5.4 and 5.5.

The Customer is responsible for ensuring that their own equipment is rated to withstand the available fault current according to the NEC and National Grid ESB 750, which specifies that the fault current should be no more than 80% of the device interrupting rating.

Any assumptions made in calculating the fault current shown in Table 6 are identified in Section 2.1.1.

PRE PROJECT	SUB BUS	PCC
3-phase (LLL)	6788	2795
Phase-Ground (LG)	6983	1614

POST PROJECT	SUB BUS	PCC	DELTA I_{fault} @ SUB BUS	DELTA I_{fault} @PCC
3-phase (LLL)	7072	3084	4.18%	10.34%
Phase-Ground (LG)	7444	2429	6.60%	50.50%

Table 6: Fault Duty

5.4 Substation Protective Device Modifications

The existing device settings and associated time-current curves were evaluated for protective devices at the substation.

The protection coordination review of the area EPS revealed that the following modifications to the existing substation protective devices will be required. Associated costs are identified in Section 8 of this Impact Study:

- Adjust the 68F1 breaker 51 primary and backup elements

5.5 Area EPS Protective Device Coordination

The Project will require a Company owned recloser at the PCC.

The existing device settings and associated time-current curves were evaluated for protective devices on the Interconnecting Circuit.

The protection coordination review of the area EPS revealed that the following modifications to the existing area EPS protective devices will be required. Associated

costs are identified in Section 8 of this Impact Study. Refer to Appendix B for system modification drawings:

- Install a recloser at proposed pole # 2 Shannock Hill Road
- Install a recloser at pole # 22 South County Trail
- Replace recloser at pole # 2-50 Kingstown Road.
- Adjust recloser settings at pole # 1 Usquepaugh Road
- Adjust recloser settings at pole # 49 South County Trail

6.0 Customer Equipment Requirements

The following Section discusses requirements for Customer owned equipment, which are further outlined in detail in ESB 756D. References to ESB 756D are provided in each sub-section below. It is the Customer's responsibility to comply with all requirements of ESB 756D. Please note that applicable sections of ESB-756D are referenced for information purposes and may not comprise the entirety of applicable sections.

In general, the Customer Facility shall have the capability to withstand voltage and current surges in accordance with the environments defined in IEEE Standard C62.41.2-2002 or IEEE Standard C37.90.1-2002 as applicable.

6.1 Service Entrance Equipment (ESB 756D Section 7.2.1)

The Customer provided documents indicate that the equipment is service entrance rated, therefore it satisfies the requirement of this Section of ESB 756D.

6.2 Revenue Metering Requirements (ESB 756D Section 7.2.2)

For systems greater than 60 kW, Interconnecting Customer shall provide a means of communication to the National Grid revenue meter. This may be accomplished with an analog/POTS (Plain Old Telephone Service) phone line (capable of direct inward dial without human intervention or interference from other devices such as fax machines, etc.), or, in locations with suitable wireless service, a wireless meter.

Feasibility of wireless service must be demonstrated by Interconnecting Customer, to the satisfaction of National Grid. If approved, a wireless-enabled meter will be installed, at the customer's expense. If and when National Grid's retail tariff provides a mechanism for monthly billing for this service, the customer agrees to the addition of this charge to their monthly electric bill. Interconnecting Customer shall have the option to have this charge removed, if and when a POTS phone line to National Grid's revenue meter is provided.

Refer to *Appendix A Figures A-1 and A-2 - Revenue Meter Phone Line Installation Guide).*

The Customer is advised to contact Generation and Load Administration (NewGenCoord@iso-ne.com) at ISO New England regarding all metering, communications circuits, remote access gateway (rig), financial assurance, paperwork, database updates, etc. that may be required for this Facility.

6.3 Interconnecting Transformer (ESB 756D Section 7.3)

The proposed transformers satisfy the requirements of the ESB. See Section 2.1.

6.4 Effective Grounding (ESB 756D Section 7.3.2.1)

The Company requires DG installations to be effectively grounded, which is defined in IEEE C62.92.1 section 7.1. Additionally, the Company requires that DG installations do not raise the overvoltage above 125% on the unfaulted phases during ground faults on the distribution circuits. Refer to IEEE C62.92.1 sections 6.3 and 7.1 for further details.

The proposed configuration has been analyzed and found to meet the effective grounding requirements. However, a neutral reactor is necessary to meet the fault contribution criteria, which requires limiting the ground source to reduce the impact on Company protective device settings. Neutral reactors sized at 20 ohms, connected to the primary winding of each interface transformer respectively, will effectively reduce the impact on Company protective device settings.

The proposed grounding reactor is recommended to have a continuous current rating of no less than 100A.

6.5 Manual Generator Disconnecting Means (ESB 756D Section 7.4)

The Customer provided documents satisfy the requirement of this Section of ESB 756D.

6.6 Generator Interrupting Device (ESB 756D Section 7.5)

The Customer provided documents indicate an interrupting device on the high side of the interconnecting transformer, which satisfies the requirements of ESB 756D.

6.7 Primary Protective Relaying (ESB 756D Section 7.6.1 and 7.6.2)

The Customer provided documents indicate that the generator/inverter will be provided with an internal relay that will trip the generator interrupting device. Proposed settings for the 27, 59, 81O/U functions have been provided for review.

6.8 Protective Relaying Redundancy (ESB D756D Section 7.6.3)

The Customer provided documents indicate that a redundant utility grade relay is provided that will trip the generator interrupting device. Relay make/model are included on the Customer single line.

6.8.1 Protective Relay Hard-Wiring (ESB 756D Section 7.6.5)

The Customer provided documents call for hardwiring of the redundant relaying trip circuits, therefore satisfies the requirements of this section of ESB 756D.

6.8.2 Protective Relay Supply (ESB 756D Section 7.6.5 and 7.6.6)

The Customer provided documents indicate a power supply for the redundant relay that satisfies the requirements of this section of ESB 756D.

The Customer has proposed a DC power supply. The Customer shall demonstrate in the witness test that the relay will trip if the DC voltage goes out of the normal operating range.

6.8.3 Voltage Relay Elements (ESB 756D Section 7.6.7)

The Customer provided documents satisfy this Section of ESB 756D.

6.8.4 Overcurrent Relay Elements (ESB 756D Section 7.6.10)

Customer proposed settings are provided on the Customer drawings, as attached in Appendix C.

The Customer's provided 51C phase relay settings do not provide sufficient sensitivity or coordination with other devices on the EPS. The following are maximum values that would be acceptable for coordination.

Values are provided here for informational purposes only. The Customer must provide revised settings for review by the Company:

51C – Phase

Customer Proposed: 95A primary amps pickup, 2.0 Time Dial, U4 curve

Company Suggested Maximum: 80A primary amps pickup, 1.5 Time Dial, U4 curve

51C – Ground

Customer Proposed: 65A primary amps pickup, 2.5 Time Dial, U4 curve

Company Suggested Maximum: N/A, proposed settings acceptable

The above is provided for informational purposes only. It is the Customer's responsibility to provide revised settings that will be sufficient to trip the Customer's interrupting device for faults on the Company system as well as for faults within the Facility. The Company will evaluate for coordination with EPS protective devices.

6.8.5 Utility Restoration Detection (ESB 756A Section 4.5.2.7)

Following a trip of the protective relay, a Utility Restoration Detection function shall prevent manual and automatic reclosing of the Customer's DG intertie device until the Customer's relay has detected that the Utility EPS has been within the voltage and frequency windows identified by IEEE 1547 section 4.2.6 for a minimum of five minutes. The five minute time interval is required to restart if the utility voltage or frequency falls outside of this window.

All the devices associated with five minute timing must meet IEEE C37.90 standard and capable of withstanding voltage and current surges.

The Customer's one line diagram shows utility grade devices and settings to satisfy this requirement.

6.8.6 Relay Failure Protection (ESB 756D Section 7.6.3)

For all required tripping functions, either redundant relaying or relay failure protection, where a hardware or power supply failure for the

redundant relay automatically trips and blocks close of the associated breaker, is required.

The Customer's one line diagram shows devices and settings to satisfy this requirement.

6.9 Current Transformers ("CT") (ESB 756D Section 7.6.4.1)

The Customer provided documents satisfy this Section of ESB 756D. Customer to provide revised documentation to show the quantity of CTs being used by the relay.

6.10 Voltage Transformers ("VT") and Connections (ESB 756D Sections 7.6.4.2)

The Customer provided documents show wye-grounded/wye-grounded VT's that use a low energy analog input. The effective VT ratio is provided, which satisfies this Section of ESB 756D.

6.11 Synchronizing Devices (ESB 756D Section 7.6.9 and 7.6.11.2)

Project is inverter based; therefore synchronizing devices are not required.

6.12 Under Frequency Protection (ESB 756D Section 7.6.11.1)

The R.I.P.U.C. No. 2163, requires that, the Distributed Resources (DR) cease to energize the area EPS within 2 seconds, refer to IEEE1547 and UL1741. The Facility's response to abnormal frequencies (RI SIDG Section 4.2.3.2.1) requires that NPCC Directory 12 Figure 1 Curve "Standards for Setting Underfrequency Trip Protection for Generators" for the Eastern Interconnection be followed. Clearing time is considered as the time that it takes the relay to initiate a trip plus the breaker operating time.

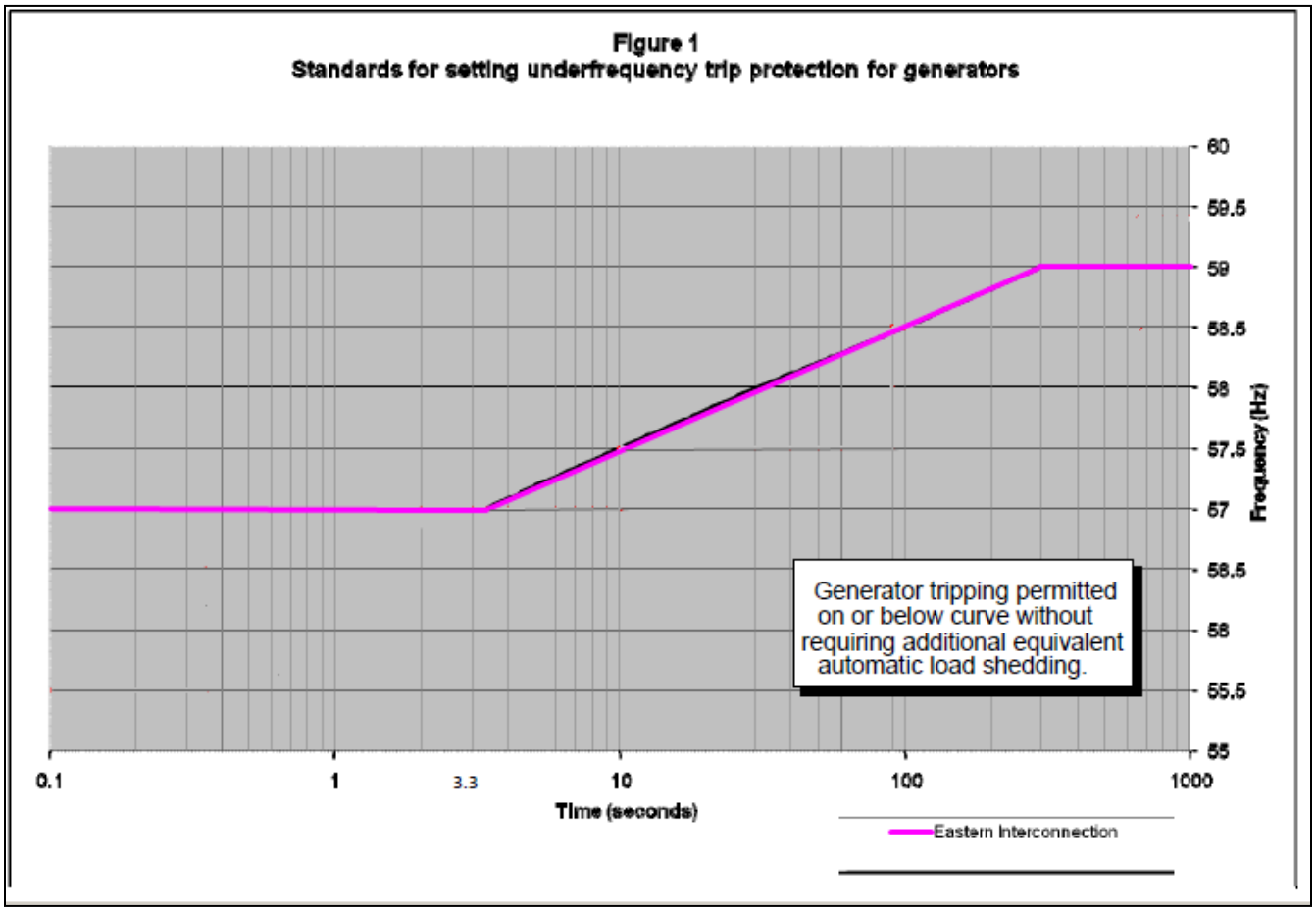


Figure 2: NPCC Directory 12 Figure 1 Curve

The under frequency set points shall comply with the NPCC standard for setting under frequency trip protection. Per the NPCC Directory 12 Figure 1Curve, if the setting falls above the curve, there must be an equivalent amount of load shed when tripped, which in this case cannot be done, therefore the under frequency (81) relay setting must be set on or below the curve.

The DG's internal relays shall also meet the *NPCC Directory 12 Figure 1 Curve* requirements for the Eastern Interconnection.

The Customer proposed 81U inverter settings meet the aforementioned requirements. The Customer must submit a PE stamped one-line that provides redundant relay settings in accordance with the aforementioned requirements.

6.13 Customer Cabling

The Customer documentation has provided a means for primary protection between the Generator disconnect switch and Customer owned transformer to protect the Customer cable. The Company is not responsible for the protection of the Customer cable and primary protection for the Customer cable must be provided at the change of ownership.

7.0 Telemetry and Telecommunications

The Customer is advised to communicate with ISO-New England for any telemetry requirement as ISO-NE may require real-time monitoring between ISO-NE EMS and the DG site. The Customer shall refer to the ISO-NE website and ISO-NE customer service help desk for details.

This project is considered an independent power producer (IPP), an RTU for telecommunication will not be required by the Company.

8.0 Inspection, Compliance Verification, Customer Testing, and Energization Requirements

8.1 Inspections and Compliance Verification

A municipal electrical inspection approval certificate from the local authority having jurisdiction is required of the Customer's Facilities (i.e. primary service entrance conduit, primary switchgear, wiring, and generation equipment). The Company must receive the Customer's Draft set of Project documentation and test plan for the functional verification tests at least four (4) weeks before the Company's field audit. Documentation from the customer must include, but not be limited to:

- Equipment cut sheets and shop drawings for all major equipment
- Inverter manufacturer cut sheet including method of island detection and UL certification
- Inverter protective relay settings
- Settings for any other Customer relay related to the Project
- The most recent version of the single line diagram and site plan, reflecting all modifications required in this Impact Study

- Single line diagram of the Facility
- Site diagram of the Facility
- A 3-line diagram and DC schematic illustrating the protection and control scheme
- The proposed testing procedure
- The proposed energization plan
- All provided Customer drawings shall be stamped and signed by an Electrical Professional Engineer that is licenses in the state where the Facility is located.

The DG Customer shall adhere to all other Company related verification and compliance requirements as set forth in the applicable ESB 750 series documents. These and documented acceptance testing requirements of these facilities will be specified during the Draft design review of the Project prior to the Company's field audit and energization.

8.2 Testing and Commissioning

The Customer shall submit initial relay settings to the Company no later than twenty-one (21) calendar days following the Company's acceptance of the Facility's service connection's Draft RI state licensed professional engineer sealed design. If changes/updates are necessary, the Company will notify the Customer three (3) business days after the initial relay settings were received, and the Customer shall submit the revised settings within seven (7) calendar days from such notification. Within three (3) business days of receipt of the proposed Draft relay settings, the Company shall provide comments on and/or acceptance of the settings. If the process must continue beyond the above evolution due to errors in the relay settings, the Company retains the right to extend the Testing and Commissioning process, as needed, to ensure the Draft relay settings are correct.

Assuming no major issues occurring with the relay settings, the Customer shall submit a Testing and Commissioning Plan (TCP) to the Company for review and acceptance, no later than forty-five (45) calendar days following the Company's acceptance of the Facilities Draft design. The TCP must be drafted, including Company acceptance, no later than six (6) weeks prior to functional testing. The Company requires a minimum of 5 business days for review of any submitted documentation.

8.3 Energization and Synchronization

The “Generator Disconnect Switch” at the interconnection point shall remain “open” until successful completion of the Company’s field audit and witness testing.

Prior to the start of construction, the DG Customer shall designate an Energization Coordinator (EC), and prepare and submit an Energization Plan (EP) to the Company for review and comment. The energization schedule shall be submitted to the Company and communicated with the Company’s local Regional Control Center at least two (2) weeks in advance of proposed energization. Further details of the EP and synchronization requirements will be specified during the Draft design review of the Project.

The Customer shall submit as-built design drawings to the Company 90 days following commercial operation of their DG Facility.

9.0 Cost Estimate

The non-binding good faith cost planning grade estimate for the Company's work associated with the interconnection of this Facility to the EPS, as identified in this report, is shown below in Table 7:

National Grid System Modification	Conceptual Cost +/-25% Planning Grade Cost Estimate not including Tax Liability				Associated Tax Liability Applied to Capital	Total Customer Costs includes Tax Liability on Capital Portion
NECO - Line Work, Customer Property	**Pre-Tax Total**	**Capital**	**O&M**	**Removal**	**11.28%**	**Total**
Equipment at Point of Common Coupling. See Note #2	$118,068	$117,039	$0	$1,029	$13,202	$131,270
SUBTOTAL	**$118,068**	**$117,039**	**$0**	**$1,029**	**$13,202**	**$131,270**

NECO - Line Work, Mainline	Pre-Tax Total	Capital	O&M	Removal	11.28%	Total
Line Extension to DG Tap See Note #3	$615,366	$588,197	$0	$27,169	$66,349	$681,715
Recloser Installation at pole # 22 South County Trail See Note #4	$82,637	$77,346	$3,829	$1,462	$8,725	$91,362
Recloser replacement at pole # 2-50 Kingstown Road See Note #5	$88,917	$79,952	$5,743	$3,222	$9,019	$97,936
Protection Setting Changes See Note #6	$3,200	$0	$3,200	$0	$0	$3,200
Capacitor Setting Changes See Note #7	$1,600	$0	$1,600	$0	$0	$1,600
SUBTOTAL	**$791,720**	**$745,495**	**$14,372**	**$31,853**	**$84,093**	**$875,813**

NECO - Substation Work (Distribution Level)	Pre-Tax Total	Capital	O&M	Removal	11.28%	Total
Substation modifications for 3V0. See Note #8	$64,000	$56,000	$8,000	$0	$6,317	$70,317
68F1 breaker settings change	$1,600	$0	$1,600	$0	$0	$1,600
SUBTOTAL	**$65,600**	**$56,000**	**$9,600**	**$0**	**$6,317**	**$71,917**

NECO - Substation Work (Transmission Level)	Pre-Tax Total	Capital	O&M	Removal	10.03%	Total
Substation modifications for 3V0. See Note #9	$208,000	$196,000	$12,000	$0	$19,659	$227,659
SUBTOTAL	**$208,000**	**$196,000**	**$12,000**	**$0**	**$19,659**	**$227,659**

Witness Testing & EMS	Pre-Tax Total	Capital	O&M	Removal	NA	Total
Witness Testing. See Note #10	$2,500	NA	$2,500	NA	NA	$2,500
EMS integration. See Note #11	$5,000	NA	$5,000	NA	NA	$5,000
SUBTOTAL	**$7,500**	**$0**	**$7,500**	**$0**	**$0**	**$7,500**

	Pre-Tax Total	Capital	O&M	Removal	Tax	Total
Totals	**$1,190,888**	**$1,114,534**	**$43,472**	**$32,882**	**$123,271**	**$1,314,159**

Notes

1. Definition of abbreviation: NECO-Narragansett Electric Co.
2. Install a disconnect switch at proposed pole # 45-1 Beaver River Road. Install a recloser at proposed pole # 45-2 Beaver River Road. Install a primary meter at proposed pole # 45-3 Beaver River Road. Install poles, ~150' of 477 AAC conductor, and guying necessary for DG tap.
3. Build ~3,400' of new three-phase 3-477 AAC spacer primary from pole # 46 South County Trail, along Shannock Hill Road and Beaver River Road. Transition to ~1,600' of 3-477 AAC crossarm configuration on Beaver River Road until the DG tap at or near pole # 45 Beaver River Road.
   - o Install a disconnect switch at proposed pole # 1 Shannock Hill Road
   - o Install a recloser at proposed pole # 2 Shannock Hill Road
   - o Install a 3-10 kVA transformer bank at proposed pole # 3 Shannock Hill Road to provide load-side voltage sensing to the recloser at proposed pole # 2
4. Install a disconnect switch at pole # 22-50 South County Trail
   Install a recloser at pole # 22 South County Trail
5. Replace recloser at pole # 2-50 Kingstown Road
   Install a disconnect switch at pole # 3 Kingstown Road
6. Adjust recloser settings at pole # 1 Usquepaugh Road
   Adjust recloser settings at pole # 49 South County Trail
   Review and Implementation of protective device settings including field implementation and associated engineering review/documentation in Company tracking system(s)
7. Adjust control settings for the capacitor bank at pole # 72 Usquepaugh Road
8. Substation modifications for 3V0 including control wiring to trip substation feeder breakers and associated engineering design.
9. Substation modifications for 3V0 including installation of CCVT's on high voltage side, installation of 59N relay in the existing substation control house and associated engineering design.
10. Witness Testing including review of witness test documentation and manpower for attending witness test.
11. Integration of DG and EPS modifications into Company's Energy Management System (EMS)

Table 7: Cost Estimates

The planning grade estimate provided in is based on information provided by the Interconnecting Customer for the study, and is prepared using historical cost data from similar projects. The associated tax effect liability included is the result of an IRS rule, which states that all costs for construction collected by the Company, as well as the value of donated property, are considered taxable income.[3] This estimate is valid for ninety (90) calendar days from the issuance of this report, after which time it becomes void. If the Interconnection Customer elects to proceed with this project after the ninety (90) calendar days, a revised estimate may be required.

The estimated duration for the Company to complete construction of the System Modifications will be identified in the Interconnection Service Agreement.

The project schedule may be impacted by the ability to have planned outages to allow work to take place on the distribution system. Outages will be contingent on the ability to support the load normally supplied by affected circuits. The schedule can also be impacted by unknown factors over which the Company has no control. The interconnection schedule is contingent on the Interconnecting Customer's successful compliance with the requirements outlined in this report and timely completion of its obligations as defined in *ESB756D, Exhibit 2: Company Requirements for Projects Not Eligible for the Simplified Process*. The schedule for the

[3] Actual charges shall include the tax rate in effect at the time the charges are incurred.

Company's work shall be addressed during the development, or after the execution, of the Interconnection Agreement

10.0 Conclusion

The project was found to be feasible. It will be allowed to interconnect with certain system modifications and additions to the local Company EPS. Associated costs are provided in Section 9.0. Applicable cost sharing allocations, if any, will be calculated by the Company and provided in the Interconnection Service Agreement.

The Customer must submit revised documentation as identified herein, to the Company for review and approval before an ISA can move forward.

A milestone schedule shall be included in the ISA and shall be reflective of the tasks identified in ESB756D, Exhibit 2. Upon execution of the ISA, and prior to advancing the project, the Customer shall provide a detailed project schedule, inclusive of the Exhibit 2 tasks referenced above. After completion of final design and all associated applications, fees, permitting and easement requirements are satisfied, System Modifications for this Project will be placed in queue for construction.

If a Customer fails to meet the R.I.P.U.C No 2163, Section 3.1 & RI SCDG Time Frames and does not provide the necessary information required by the Company within the longer of 15 days or half the time allotted to the Company to perform a given step, or as extended by mutual agreement, then the Company may terminate the application and the Customer must re-apply.

Note: Authorization for parallel operation will not be issued without a fully executed Interconnection Agreement, receipt of the necessary insurance documentation, and successful completion of the Company approved witness testing. Such authorization shall be provided in writing.

11.0 Revision History

Version	Date	Description of Revision
1.0	2/8/18	Issue to Customer

Appendix A Revenue Metering Phone Line Requirements

An analog phone line to National Grid's revenue meter shall be provided by the Customer. The analog phone line must be capable of direct inward dial without human intervention or interference from other devices such as fax machines, etc. The phone line can be a phone (extension) off the customers PBX phone system, or it may be a separate dedicated phone line as provided by the Telephone Company. The following is to be used as a guide, please contact the Company if additional information is required. The most common installations are outlined below, Wall mounted Meter Installation, Outdoor Padmount Transformer Meter Installation, and Outdoor Pole Mounted Meter Installation.

1) WALL MOUNTED METER INSTALLATION

If the meter is wall mounted indoor or outdoor the customer shall provide a telephone line within 12" of the meter socket and additional equipment as described and shown below in figures 1A & 1B. National Grid will connect the meter to the customer provided phone line.

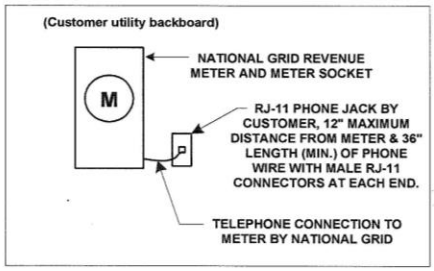


Figure 1A – Indoor Meter Installation
not to scale

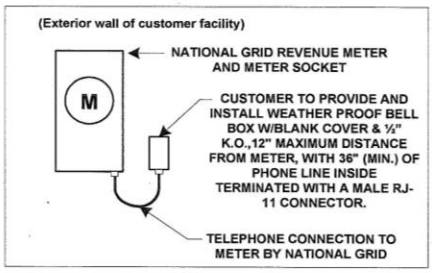


Figure 1B – Outdoor Meter Installation
not to scale

2) OUTDOOR PADMOUNT TRANSFORMER METER INSTALLATION

If the meter is mounted outside on the secondary compartment of the padmount transformer as shown below the conduit shall stub up and roughly line up with the bottom or side knock out of the meter socket and terminate into a weatherproof box or fitting. A liquid tight flexible conduit whip with end bushing and locknut of sufficient length to reach and terminate at the knockout location of the meter socket with three feet of telephone wire coiled (and terminated with a male RJ-11 connector) at its end shall be connected to the weatherproof box or fitting. National Grid will connect the conduit whip to the meter socket and terminate the telephone wire to the meter (see figure 2 below).

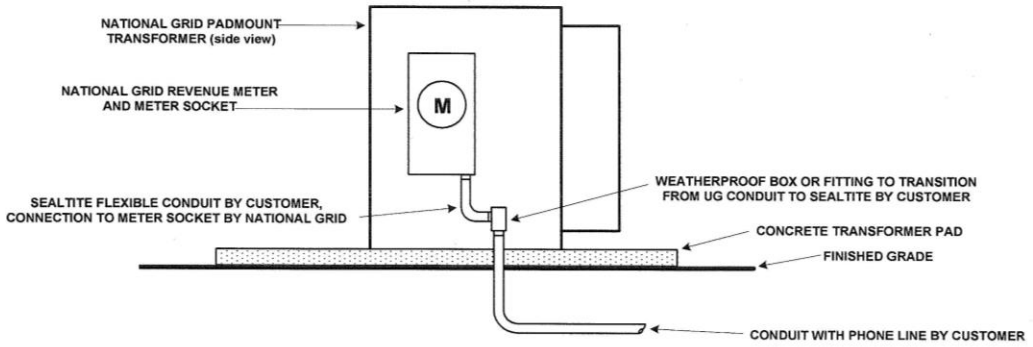


Figure A- 1: Revenue Meter Phone Line Installation Guide

3) OUTDOOR POLE MOUNTED METER INSTALLATION

If the meter is located outdoor on a Company owned utility pole as part of a primary metering installation the Customer will install and connect a phone line from the Telephone Company provided termination interface box, the line shall be terminated with a RJ-11 male connector and be of sufficient length to reach the meter socket and create a drip loop, as well as additional line for final connection to the meter. The customer is responsible for the Telephone Company phone line installation. (see figure 3 below).

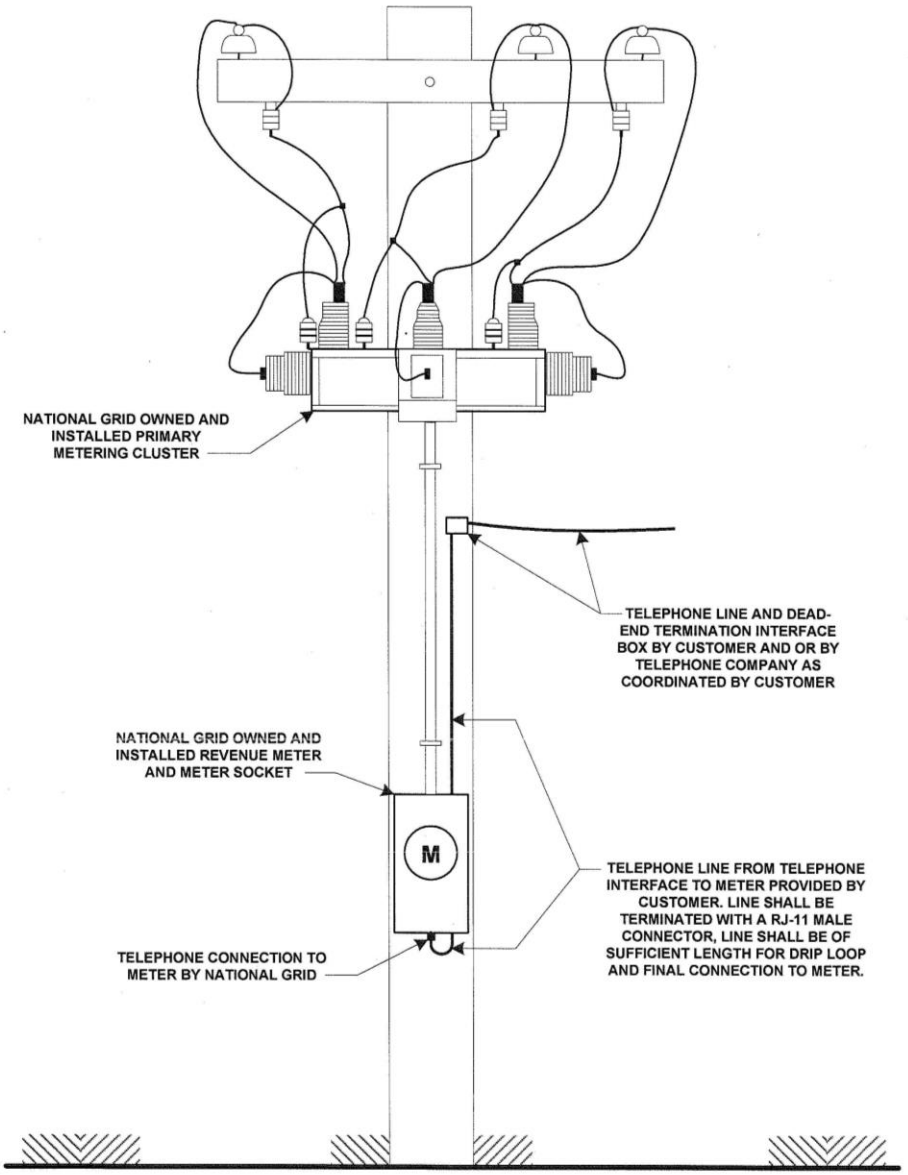


Figure A- 2: Revenue Meter Phone Line Installation Guide

Appendix B System Modification Diagrams

Note: Company EPS modification diagrams provided in this Appendix are intended as a diagrammatic reference of work required to be completed before this Facility may interconnect. The Company will be performing a detailed design following this Impact Study, should the Customer elect to move forward with the interconnection process. At that time, the Company will determine exact locations and requirements for system modification designs. Refer to the body of this Impact Study for further discussion regarding specific EPS modifications that are required for the interconnection of this Facility.

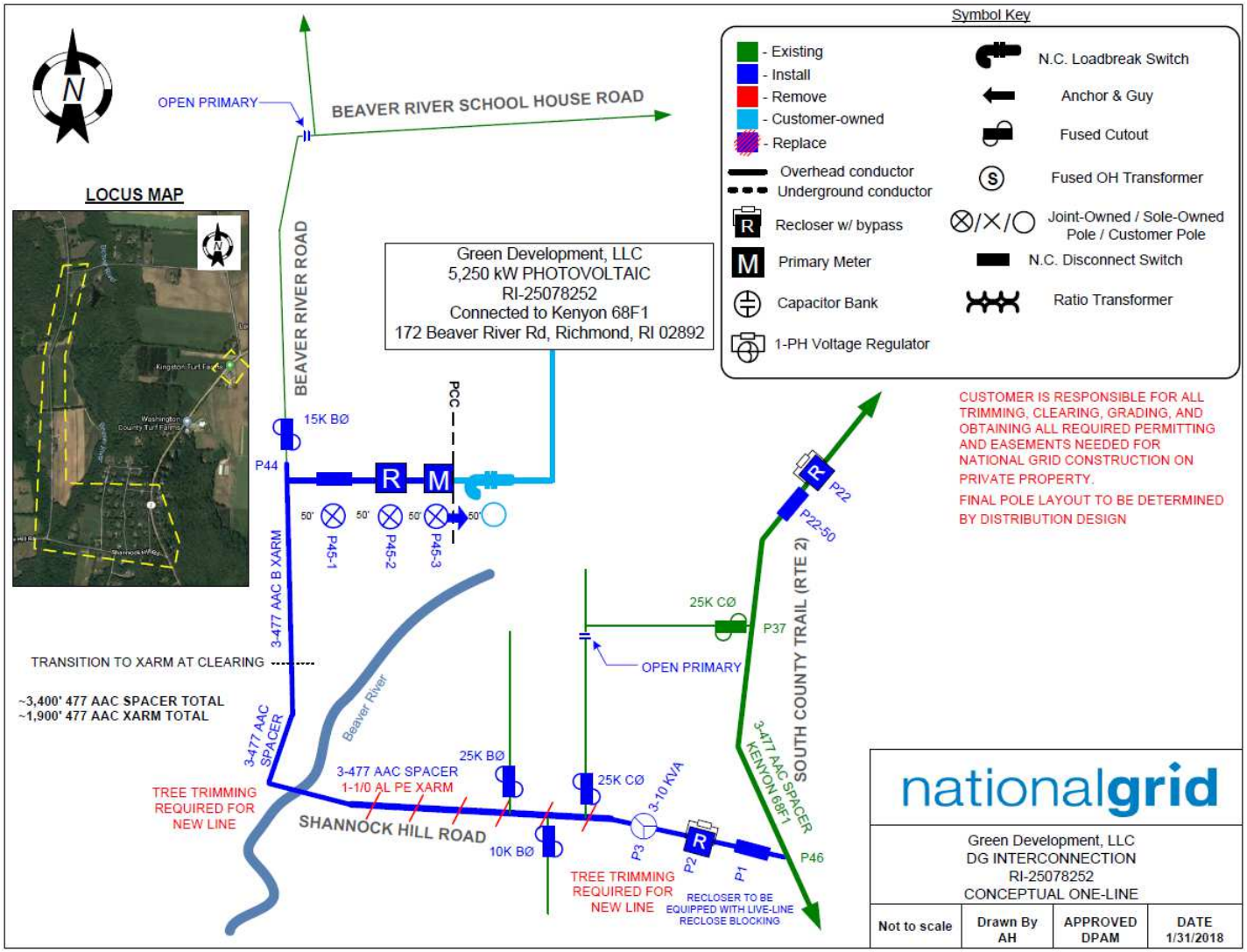


Figure B- 3: Line Extension, PCC Configuration, and New Recloser Installations

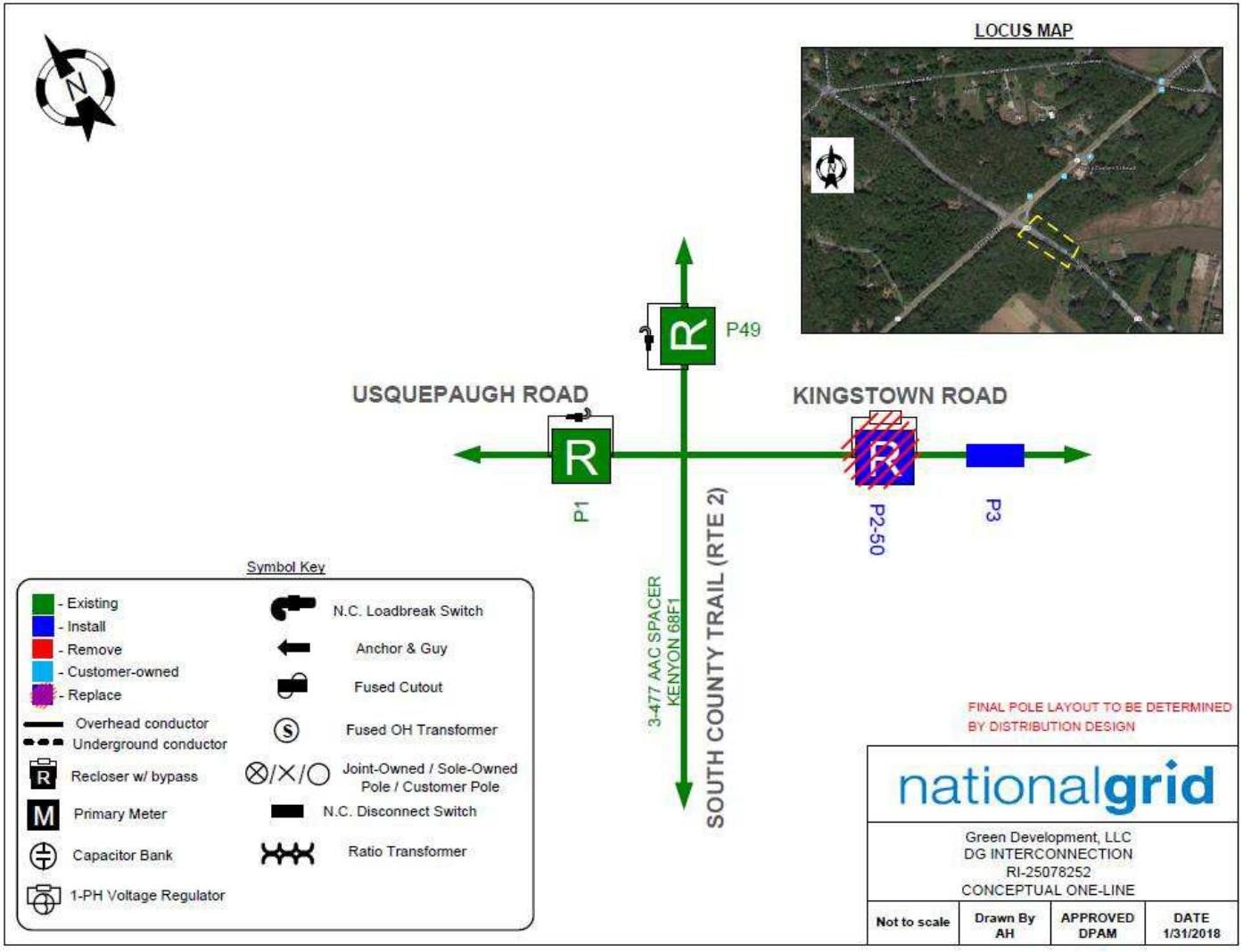


Figure B- 4: Recloser Replacement

Appendix C Customer Site and Single Line Diagram

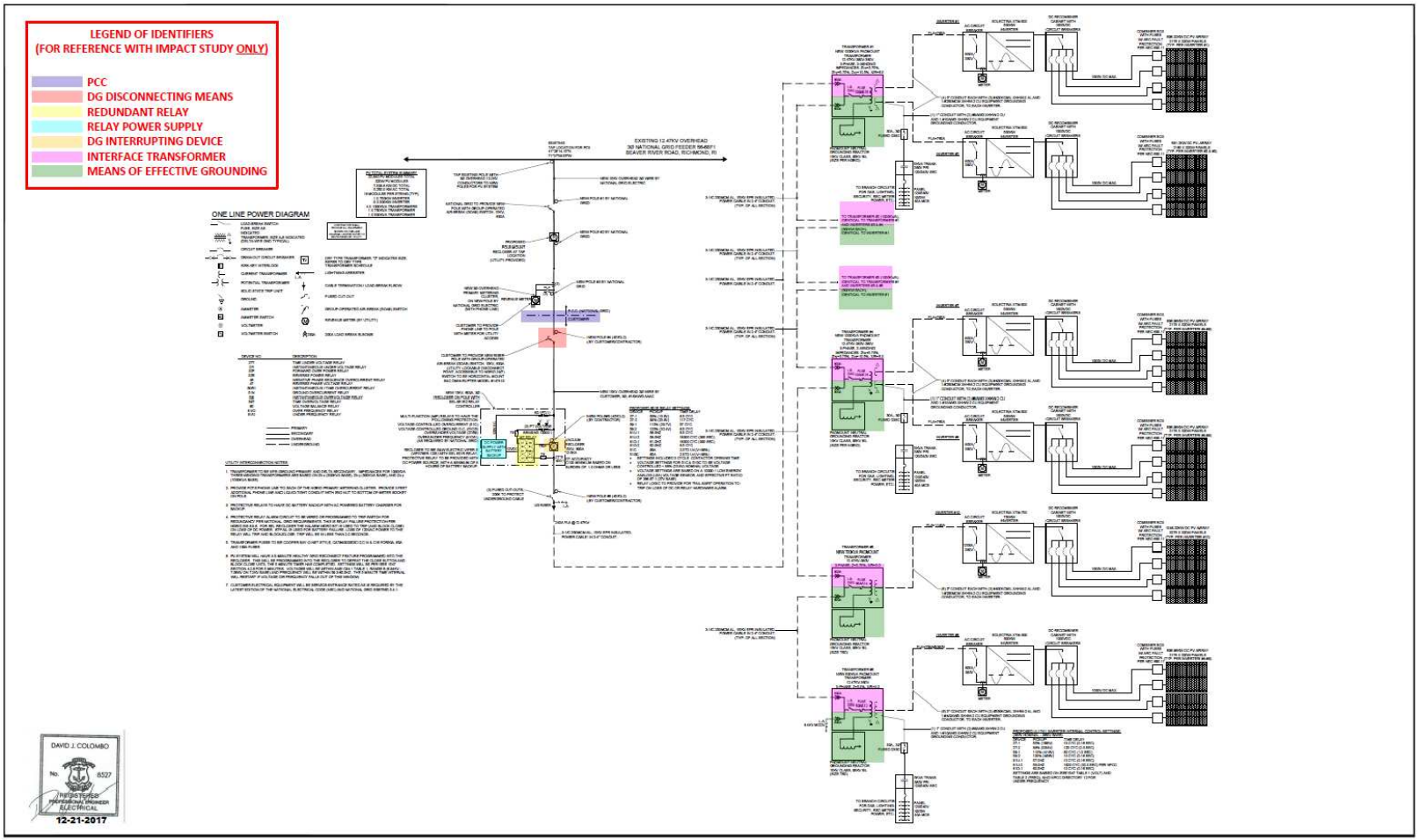


Figure C- 1: Project One-Line
(Refer to body of Impact Study for specific discussion on equipment and requirements. Highlighting of equipment in this Figure does not necessarily denote acceptance)

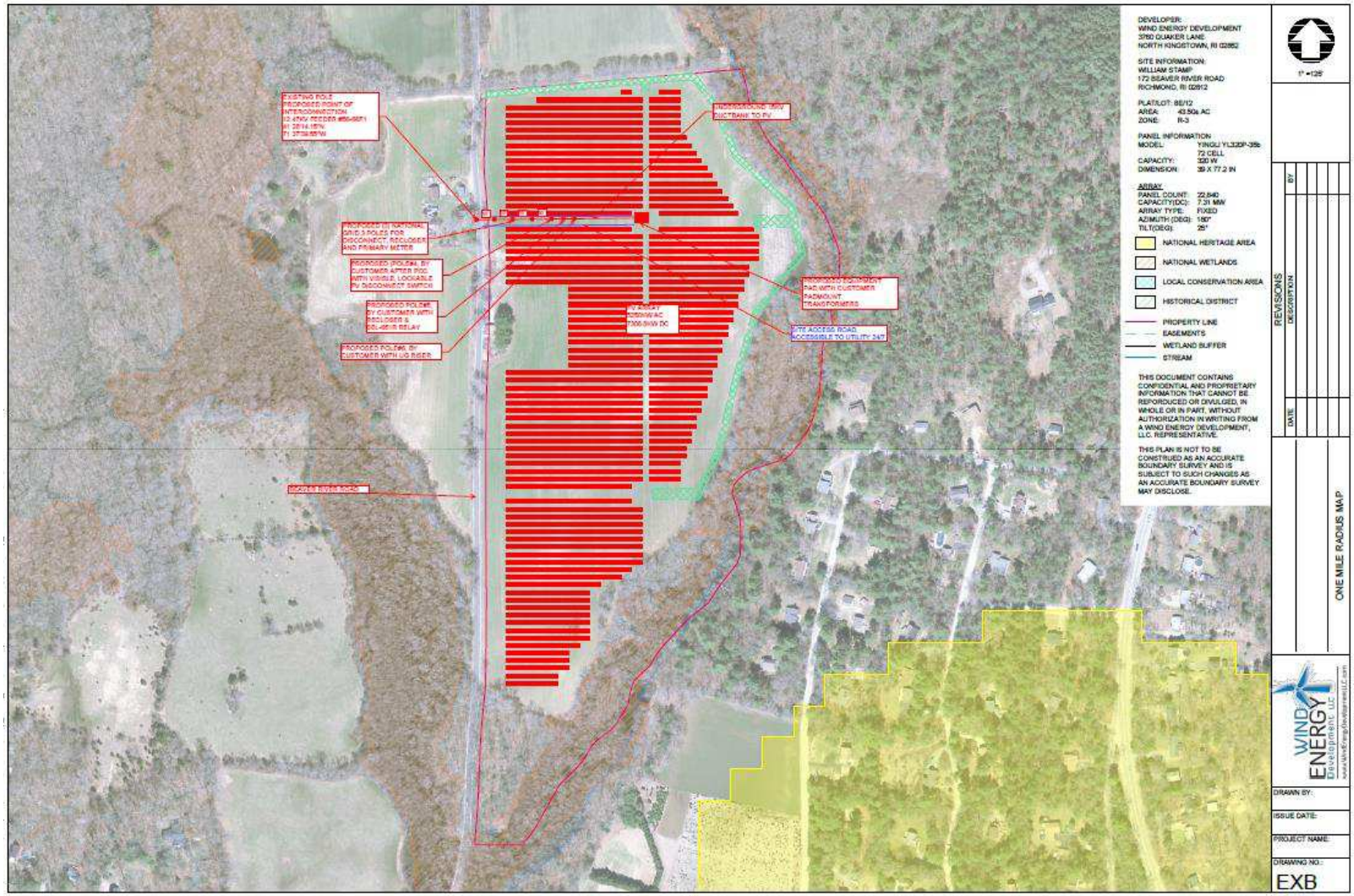


Figure C- 2: Project Site Plan

ManciniCarter PC
Attorneys At Law

Straight, Forward Thinking.

John O. Mancini, Esq.
Shareholder
Admitted in RI, MA and CT
jmancini@mancinicarter.com

April 20, 2018

Karen Ellsworth, Esq.
Richmond Town Hall
5 Richmond Town House Road
Wyoming, RI 02898

Re: GD Richmond Beaver River One, LLC – 172 Beaver River Road

Dear Ms. Ellsworth,

The undersigned is legal counsel to GD Richmond Beaver River One, LLC ("Applicant") with regards to its application for a Development Plan Review, concerning the property located at 172 Beaver River Road located in the Town of Richmond and particularly laid out as Assessor's Plat 8E, Lot 12 and consisting of approximately 43.67 acres (the "Property"). Currently, the Property consists of a single family residential dwelling utilized as a farm field located within the R-3 Zoning District. The Applicant is proposing to utilize the Property as a solar array field, constructing upon the existing field and providing that the remainder of the field be continued as a pasture or hay fields consistent with the existing use.

In addition to our Application for a Development Plan Review, to be submitted pursuant to the Town's Ordinance, Section 18.34, the Applicant has also filed an Appeal to the Zoning Board of Review ("Zoning Board") in regards to that certain decision as issued by Russell Brown, Zoning Enforcement Officer ("Zoning Enforcement Officer") related to his interpretation of Section 18.34.030 (A), location of solar energy systems. *See* attached hereto as Exhibit A, a copy of the Appeal filed with the Zoning Board.

Importantly, the Applicant's Application is being filed pursuant to Chapter 18.34 of the Town's Zoning Ordinances entitled "Solar Energy System", as well as Chapter 18.16 entitled "Use Regulations", in order to permit ground mounted solar energy systems. In addition thereto, the Application is being filed pursuant to R.I. Gen. Laws 45-24-42 (c), which provides that a Special Use Permit may be granted in conjunction with a request by the Applicant for a dimensional variance.

Here, the Applicant is seeking Development Plan Review, along with the issuance of a Special Use Permit for the Property located in the R-3 Zoning District.

In conjunction therewith, the Applicant has also filed the instant Appeal contesting the decision of the Zoning Enforcement Officer. Pursuant the Town's Zoning Ordinances, as well as the Rhode Island General Laws, we assert that the Zoning Board may proceed to hear the appeal of the Zoning Enforcement Officers decision pursuant to R.I. Gen. Laws § 45-24-64, prior to the review of the Applicant's Application for Development Plan Review. Subsequent thereto, the Applicant may then pursue the Application.

Accordingly, the Planning Board and Zoning Board should be permitted to accept the Applicant's Application and process the same subject to the Zoning Board's review of the appeal as filed concerning the Zoning Enforcement Officer's decision.

Should you have any questions or require additional information, please do not hesitate to contact us.

Very truly yours,

John O. Mancini

EXHIBIT A

ManciniCarter PC
Attorneys At Law

Straight, Forward Thinking.

John O. Mancini, Esq.
Shareholder
Admitted in RI, MA and CT
jmancini@mancinicarter.com

April 16, 2018

Town of Richmond
Zoning Board of Review
Richmond Town Hall
5 Richmond Townhouse Road
Wyoming, RI 02898
Attention: Zoning Board Members

Re: GD Richmond Beaver River One, LLC – 172 Beaver River Road

Dear Zoning Board Members,

The undersigned is legal counsel to GD Richmond Beaver River One, LLC ("Applicant") with regards to its application for a Development Plan Review, concerning the property located at 172 Beaver River Road located in the Town of Richmond and particularly laid out as Assessor's Plat 8E, Lot 12 and consisting of approximately 43.67 acres (the "Property"). Currently, the Property consists of a single family residential dwelling utilized as a farm field located within the R-3 Zoning District. The Applicant is proposing to utilize the Property as a solar array field, constructing upon the existing field and providing that the remainder of the field be continued as a pasture or hay fields consistent with the existing use. Importantly, there shall be no clearing of wooded areas and the Applicant is proposing an appropriate vegetated buffer along Beaver River Road.

The purpose of this correspondence is to specifically appeal pursuant to R.I. Gen. Laws § 45-24-64 that decision as issued by Russell Brown, Zoning Enforcement Officer ("Zoning Enforcement Officer") relating to Section 18.34.030 (A), location of solar energy system. Specifically, the Zoning Enforcement Officer on April 2, 2018 interpreted Section 18.34.030 (A) as indicating that a solar energy system must be located **entirely** within 2 miles of a utility substation. Accordingly, the Applicant disagrees and disputes the Zoning Enforcement Officer's decision and asserts that the same is incorrect and does not comport with the plain meaning of the Ordinance. *See* attached hereto as **Exhibit A**, a copy of the Zoning Enforcement Officer's Decision.

The Zoning Enforcement Officer in his determination and decision, provided no illustration, explanation or depiction as to how he arrived at his conclusion.

Section 18.34.030 (A) states as follows: "the solar energy system shall be located within two (2) miles of a utility substation". The Zoning Enforcement Officer states that the ***provision clearly provides*** that the ***entire*** parcel must "be located within 2 miles of utility substation". However, a plain and ordinary reading of Section A indicates that the requirement established by the Ordinance is only that the solar energy system shall be located within 2-miles of a utility substation. The Ordinance does not indicate that the "entire solar array must be within a 2-mile radius of a utility substation". More importantly, the Ordinance does not say or apply that there is a radius in which the entire property must be located for it to comply with the Ordinance. The Ordinance is simply written and should be simply read to indicate that any portion of a solar energy system that is within 2 miles of a utility station would qualify for review under Section 18.34.

Under Rhode Island law, when a statute is clear and unambiguous, yet has terms left undefined, the Court must give the undefined term its plain and ordinary meaning. *See DiAmico v. Johnston Partners*, 866 A2d 1222, 1224 (RI 2005). "In carrying out the process of determining the meaning of words employed by enacting legislature, reference to contemporaneous dictionaries is appropriate and often helpful". *See Chambers v. Ormiston*, 935 A2d 956, 962 (RI 2007). Accordingly, the Zoning Enforcement Officer is charged with giving the Ordinance its plain and ordinary reading. Importantly, the Zoning Enforcement Officer cannot insert words that do not exist in the Ordinance. Rather, the Zoning Enforcement Officer must read that which has been codified by the Town Council of the Town of Richmond. Specifically, when they are undefined terms, the reviewing party may utilize a dictionary to determine the meanings of those words. Here, the operable words would be "solar energy system" and "within" .

Specifically, the "solar energy system" is defined by the Ordinance to consist of "a ground mounted solar panel array and its associated structures and components".

Moreover, Marion Webster Dictionary defines "<u>within</u>" as follows:

> as a word used as a function to indicate enclosure or containment; (2) used as a function word to indicate situation or circumstances and the limits or encompass of such as (a) before and end (b) not beyond the quality, degree or limitations of; (2): in or into the scope or sphere of; (3): in or into the range of; (4) used as a function to indicate the specified difference or margin.

Accordingly, the word "within" itself does not encompass or indicate that something has to be confined to the four corners of something else. Therefore, we assert that the Town of Richmond when using the word within clearly indicated that any portion of the solar energy system could be "within" the two-mile area.

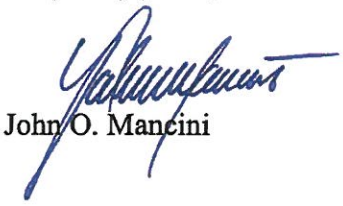
Alternatively, if the Town of Richmond Town Council sought to ensure that the <u>entire</u> solar energy system was to be restricted to a 2-mile radius, then it would have used terminology that specifically delineates as such, *i.e.* terms and words like: entire, radius, and other descriptive language to clearly indicate the intent of the Town Council's determination. Here, the plain and

ordinary meaning of the Ordinance must be applied, and in doing so, the Zoning Enforcement Officer must conclude that any portion of the solar energy system as defined by the Ordinance that is within 2 miles of a utility substation would qualify under Section 18.34.

In sum, we respectfully request that he Zoning Board reverse the decision of the Zoning Enforcement Officer and find that the plain and ordinary meaning of the Ordinance is such that any part of a solar energy system that is within the 2-mile area would be applicable for governance under Chapter 18.34.

Should you have any questions or require additional information, please do not hesitate to contact us.

Very truly yours,



John O. Mancini

EXHIBIT A

Town of Richmond, Rhode Island
5 Richmond Townhouse Road, Wyoming, RI 02898
www.richmondri.com

TO: Juliana Berry, Town Planner

FROM: Russell Brown, Zoning Enforcement Officer

DATE: April 2, 2018

RE: Section 18.34.030 (A) Location of a Solar Energy System

You have asked if a lot or parcel of land in an R-3 zoning district has a portion of that lot or parcel within two (2) miles of a utility substation, can the remaining portion of the lot or parcel of land that is outside of the two (2) mile radius be used as a solar energy system?

18.34.030 (A) is very clear that the solar energy system must be located within two (2) miles of a utility substation. Therefore any area outside of the two (2) miles radius cannot be used as a solar energy system.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

HISTORICAL PRESERVATION & HERITAGE COMMISSION

Old State House 150 Benefit Street Providence, RI 02903

Telephone 401-222-2678
TTY 401-222-3700

Fax 401-222-2968
www.preservation.ri.gov

RIHPHC No. 13747
190531.01

31 May 2019

Via email: townplanner@richmondri.com

Shaun Lacey, AICP
Town Planner
Town of Richmond
5 Richmond Townhouse Road
Wyoming, RI 02898

Re: GD Richmond Beaver River I
Beaver River Road Solar
172 Beaver River Road (Plat 8E, Lot 12)
Richmond, Rhode Island

Dear Mr. Lacey:

The Rhode Island Historical Preservation and Heritage Commission (RIHPHC) staff has reviewed the information provided for the referenced project. The Town of Richmond has requested the RIHPHC to review the referenced project and provide an opinion regarding potential effects to cultural resources. It is the RIHPHC's understanding that the Beaver River Road Solar project is a private undertaking; therefore, the RIHPHC does not have regulatory purview over the project. The following is the RIHPHC's advisory opinion.

Green Development Richmond Beaver Road I, LLC is proposing to construct a 5.3-megawatt commercial solar energy array at 172 Beaver River Road. This approximately 43.67-acre parcel primarily consists of cleared agricultural fields with wooded areas and wetlands around the property's edges to the north, east and south. Beaver River Road borders the property to the west. A single-family dwelling and a shed on the property will be demolished. The proposed solar project will occupy the agricultural field and no tree clearing is proposed.

Historic Architecture

The solar project at 172 Beaver River Road will occur within the Beaver River Road Historic District. In 1995, the Beaver River Road Historic District received a Determination of Eligibility for listing the National Register of Historic Places by the Keeper of the National Register. The Beaver River Road Historic District is significant for its intact collection of historic farmsteads complemented by a well-preserved agricultural landscape. The historic district's boundaries are centered on Beaver River Road and generally extend from a point north of Beaver River School House Road south to Shannock Hill Road. Located south of Shannock Hill Road, at 106 Lewiston Avenue, is the Samuel Clarke Farm that was listed in the National Register in early 2019.

Documentation for the Beaver River Road Historic District identified 172 Beaver River Road as a contributing resource to the Beaver River Road Historic District. The late 19th/early 20th century building at 172 Beaver River Road originally may have been an outbuilding that was later converted to a residence. The property had once been part of Jamesford, a historic farmstead that spanned both sides of Beaver River Road and was owned and operated by the James family from 1866 to 1925. The Jamesford farmhouse is the *circa* 1800, 1 ½-story Cape Cod dwelling at 165 Beaver River Road (Plat 85, Lot 3), directly across from the project area.

The demolition of 172 Beaver River Road, a contributing resource in the Beaver River Road Historic District, will have an adverse effect on historic properties. The project will also have an adverse effect on the Jamesford farmhouse (165 Beaver River Road) by introducing a modern element that it is out of character with the rural nature of this historic farmhouse. More profoundly, construction of the solar installation on open farmland will have an adverse effect on the historic district's pastoral setting, an essential character-defining feature of the resource's significance. As noted in the National Register documentation:

> The qualities that make the district distinct from its surroundings are its agricultural context and continuity of use, a visually cohesive landscape of road and farmsteads bordered by cultivated fields, and pastures, and the lack of significant intrusions.

Those inherent qualities that characterize the historic district of open farmland and scenic vistas are still evident today. Introducing a disruptive and incompatible element such as a solar array, which will consume nearly the entirety of the agricultural field, will physically and visually alter the historic district's rural, agricultural environment and diminish its integrity of setting, feeling and association. While the RIHPHC understands that a balance must be reached to accommodate new development, the proposed encroachment upon this significant historic, cultural and scenic asset would be a regrettable loss to Richmond's historic setting and agricultural heritage.

Archaeology
There are no known archaeological sites in the project, area, but based on its environmental characteristics and proximity to known sites, the RIHPHC considers it likely that there are archaeological resources present. The RIHPHC recommends that an archaeological survey should be conducted to determine if the project will have an adverse effect on significant Native American cultural resources.

For questions regarding historic architecture, please contact Glenn Modica, Senior Project Review Coordinator, at glenn.modica@preservation.ri.gov or 401-222-2671, and for questions regarding archaeology, please contact Charlotte Taylor, Senior Archaeologist, at 609-222-4140 or charlotte.taylor@preservation.ri.gov.

Sincerely,

J. Paul Loether
Executive Director and State Historic Preservation Officer

cc: John Brown, Narragansett THPO

DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION

GD Richmond Beaver River I

Direct Current(DC):7.45MW / Alternating Current(AC):5.25MW

172 Beaver River Road
Richmond, Rhode Island 02812
Assessor's Plat 8E Lot 12

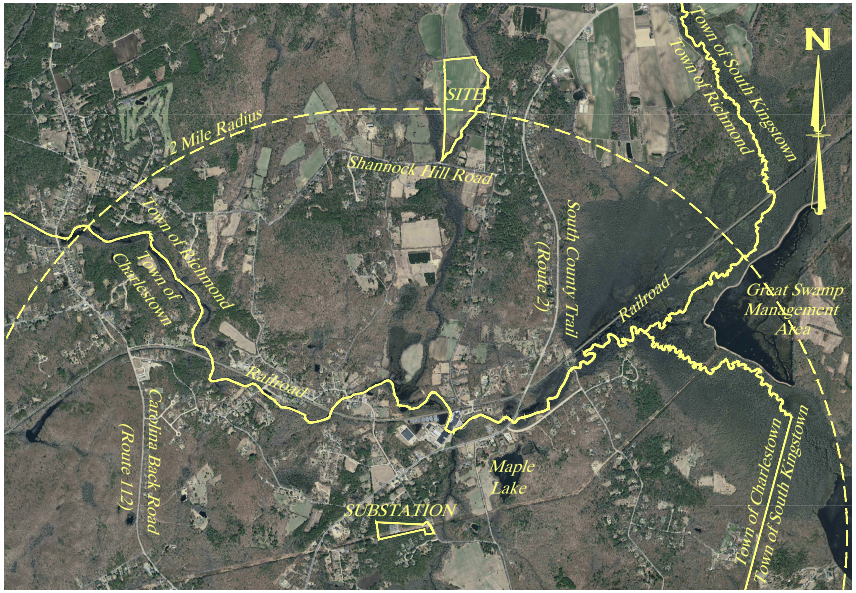
Sheet Index

Sheet Number	Sheet Title
C1.1	Cover Sheet
C1.2	Aerial & Map Sheet
C1.3	Existing Site Analysis Plan
C1.4	Proposed Site Plan
C1.5	Enlarged Site, Grading & Utility Plan - 1
C1.6	Enlarged Site, Grading & Utility Plan - 2
C1.7	Enlarged Site, Grading & Utility Plan - 3
C1.8	Soil Erosion and Sediment Control Plan
C1.9	Detail Sheet

Sheet Index

Sheet Number	Sheet Title
C1.10	Interconnection - Overall & Details
C1.11	Interconnection - Enlarged
L1.0	Landscape Plan
L1.1	Landscape Plan - Enlargement 1
L1.2	Landscape Plan - Enlargement 2
L1.3	Landscape Plan - Enlargement 3
L1.4	Landscape Plan - Planting Details
1 of 1	Boundary Survey Plan

Vicinity Map (Scale: 1"=1,000')



Substation Map (Scale: 1"=1,500')

GREEN development, LLC
3760 Quaker Lane
North Kingstown, RI 02852
(401) 295-4998
www.green-ri.com

APPLICANT INFO: GD Richmond Beaver River I, LLC
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

OWNER INFO: William M. Stamp Jr. Trustee
ONE STAMP PLACE, EXETER, RI 02882

PREPARED BY: Green Development, LLC
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

No.	DATE	REVISION	BY
6	5/9/2019	TOWN RESUBMISSION	RBS
5	5/7/2019	RIDEM RESUBMISSION	RBS
4	12/7/2018	RIDEM RESUBMISSION	RBS
3	9/7/2018	TOWN PLANNER REVIEW COMMENTS	RBS
2	5/31/2018	TOWN PLANNER REVIEW COMMENTS	RBS
1	4/19/2018	DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION	RBS

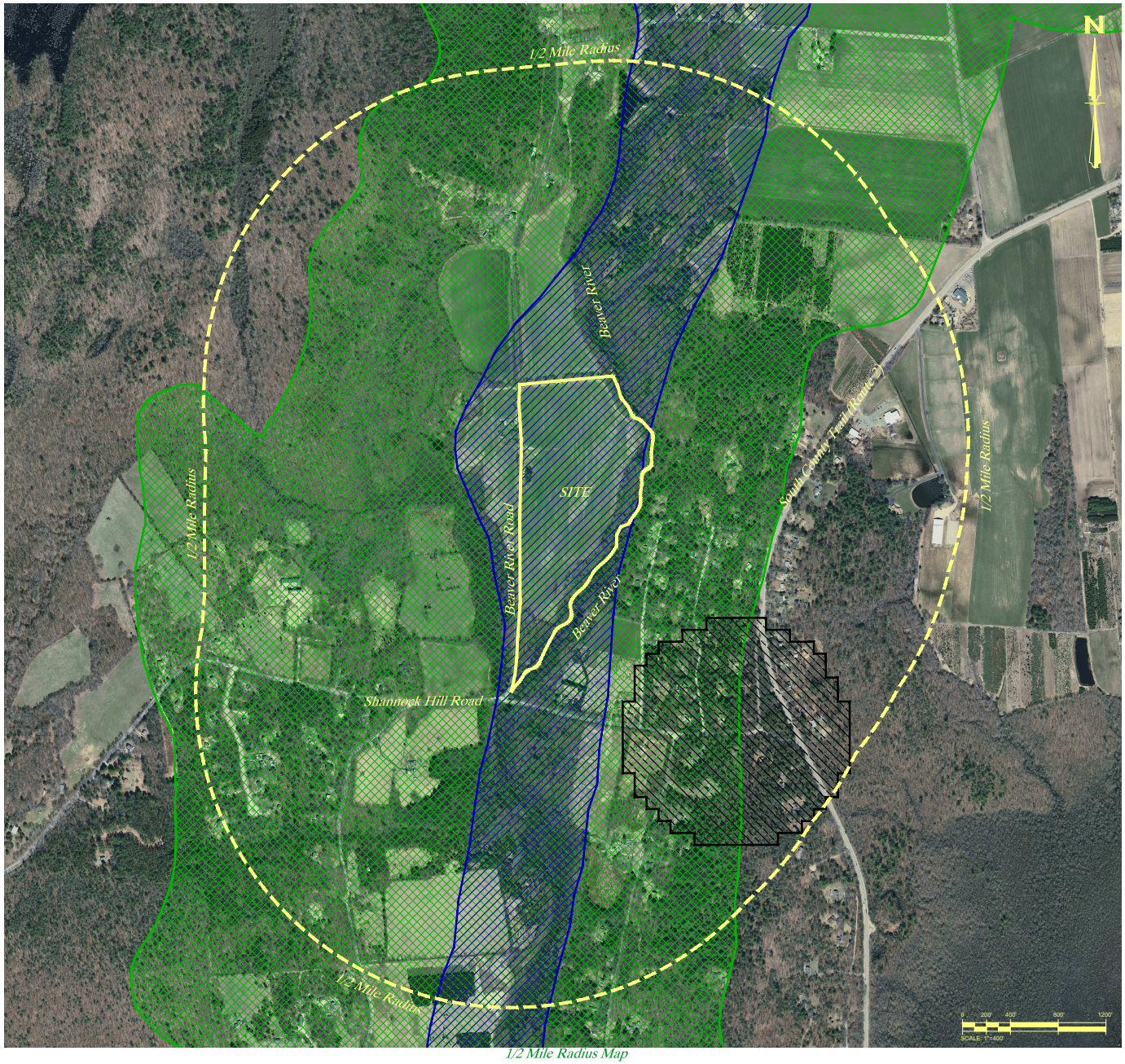
SHEET TITLE: Cover Sheet

PROJECT INFORMATION:
GD Richmond Beaver River I
DIRECT CURRENT(DC):7.45MW | ALTERNATING CURRENT(AC):5.25MW
172 BEAVER RIVER ROAD, RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

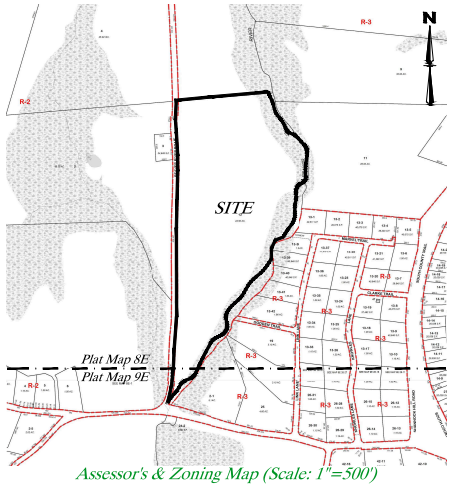
KEVIN C. MORIN
No. 9851
REGISTERED PROFESSIONAL ENGINEER
CIVIL
5/9/2019

SHEET NO.:
C1.1 OF 11

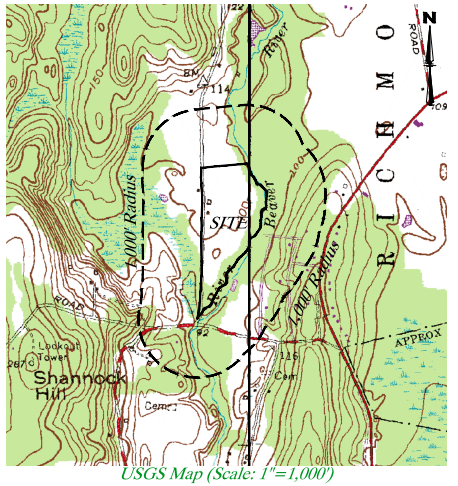
W:\Wind Drive Org Template\2. Sites\Richmond\Stamp_Beaver_River\3. Development\2. Engineering\DWG\Stamp_Beaver_River--Cover.dwg May 09, 2019 - 12:26pm



1/2 Mile Radius Map



Assessor's & Zoning Map (Scale: 1"=500')



USGS Map (Scale: 1"=1,000')

Disclaimer:

THIS PLAN IS NOT TO BE CONSTRUED AS AN ACCURATE BOUNDARY SURVEY AND IS SUBJECT TO SUCH CHANGES AS AN ACCURATE BOUNDARY SURVEY MAY DISCLOSE. INFORMATION AND IMAGES ON THIS PLAN ARE THOSE FOUND THROUGH ONLINE STATE AND CITY/TOWN GIS DATABASES. THE INFORMATION SHOWN IS ONLY AS ACCURATE AS THE INFORMATION FOUND THROUGH ONLINE SITE RESEARCH. AERIAL IMAGE DEPICTED IS FROM 2014 USGS DIGITAL TRUE COLOR ORTHOPHOTOGRAPHY. THE ASSESSOR'S AND ZONING MAP ABOVE IS TAKEN FROM PLAN TITLED "TOWN OF RICHMOND, WASHINGTON COUNTY - RHODE ISLAND, TAX ASSESSOR'S MAP WITH ZONING", TAX MAP REVISIONS THROUGH DECEMBER 31, 2014 AND ZONING AMENDMENTS THROUGH SEPTEMBER 7, 2010 FOR PLAT MAP 8E AND TAX MAP REVISIONS THROUGH DECEMBER 31, 2015 AND ZONING AMENDMENTS THROUGH AUGUST 12, 2014 FOR PLAT MAP 9E. FOR BEST CLARITY, THIS SHEET SHOULD BE REPRODUCED IN COLOR ONLY.

Existing Conditions Legend

- NATURAL HERITAGE AREA
- GROUNDWATER RESERVOIR AREA
- GROUNDWATER RECHARGE AREA

GREEN development, LLC
3760 Quaker Lane
North Kingstown, RI 02852
(401) 295-4998
www.green-ri.com

APPLICANT INFO: *GD Richmond Beaver River I, LLC*
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

OWNER INFO: *William M. Stamp Jr. Trustee*
ONE STAMP PLACE, EXETER, RI 02882

PREPARED BY: *Green Development, LLC*
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

No.	DATE	REVISION	BY
6	5/9/2019	TOWN RESUBMISSION	RBS
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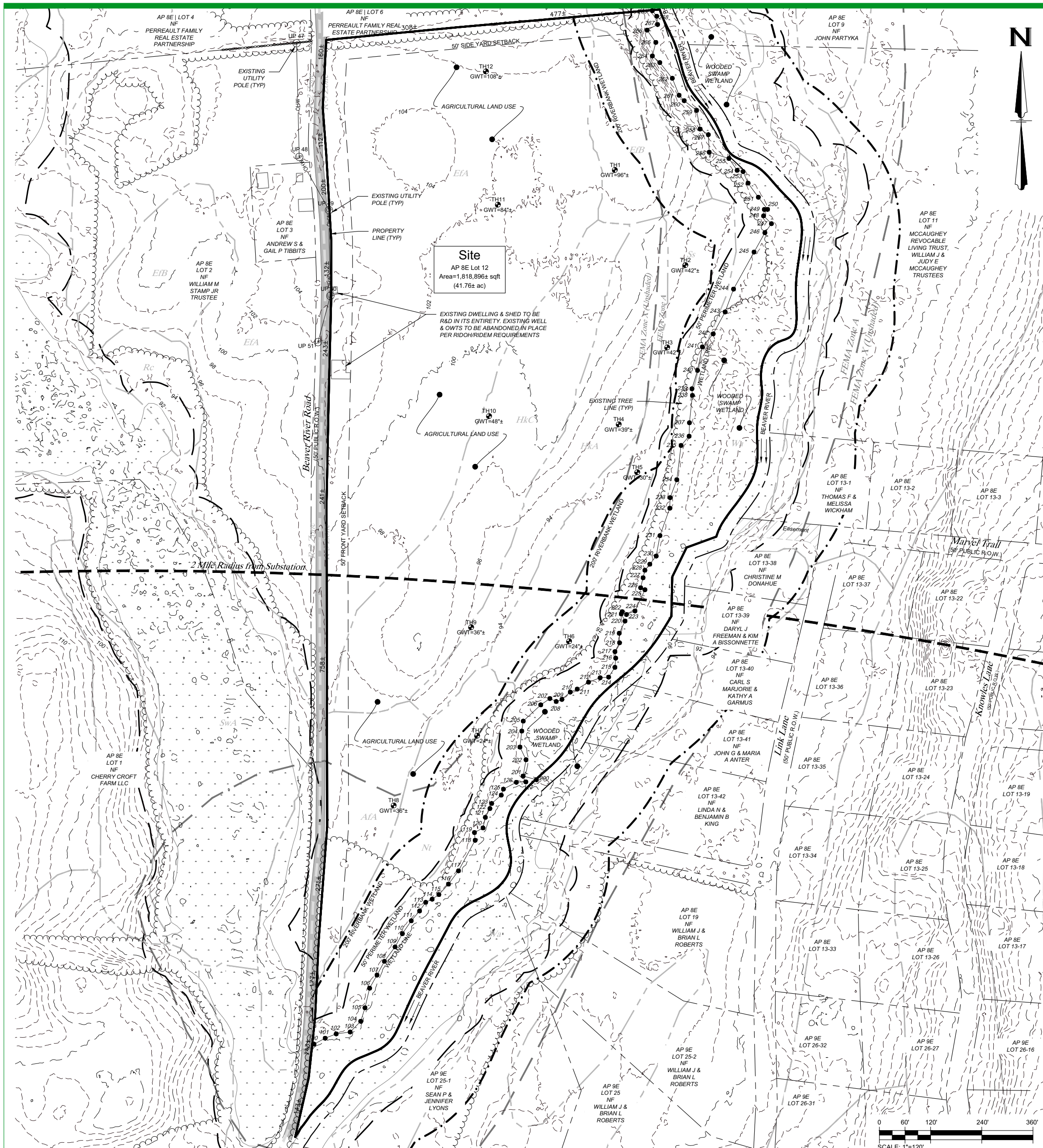
SHEET TITLE:
Aerial & Map Sheet

PROJECT INFORMATION:
GD Richmond Beaver River I
DIRECT CURRENT(DC) 7.45MW | ALTERNATING CURRENT(AC) 5.25MW
172 BEAVER RIVER ROAD, RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

KEVIN C. MORIN
No. 18851
REGISTERED PROFESSIONAL ENGINEER
CIVIL
5/9/2019

SHEET NO.:
C1.2 OF 11



General Site Information:

1. APPLICANT INFORMATION: GD RICHMOND BEAVER RIVER I, LLC
3760 QUAKER LANE
NORTH KINGSTOWN, RHODE ISLAND 02852

2. OWNER INFORMATION: WILLIAM M. STAMP JR, TRUSTEE
ONE STAMP PLACE
EXETER, RHODE ISLAND 02882

3. SITE INFORMATION: 172 BEAVER RIVER ROAD
RICHMOND, RHODE ISLAND, 02812
ASSESSOR'S PLAT 8E, LOT 12
AREA: 41.76± ACRES
ZONE: R-3 (RESIDENTIAL, 3 ACRE MINIMUM)

4. FEMA INFORMATION: THE SITE IS LOCATED WITHIN ZONE X AND ZONE A AS DELINEATED ON THE FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF RICHMOND, WASHINGTON COUNTY. FIRM MAP NUMBERS, REVISION DATES AND ZONE DESCRIPTIONS ARE AS FOLLOW:

FIRM MAP NUMBER	FIRM MAP REVISION DATE
44009C0160H	OCTOBER 19, 2010
44009C0180H	OCTOBER 19, 2010
44009C0178H	OCTOBER 19, 2010
44009C0159H	OCTOBER 19, 2010

ZONE	DESCRIPTION
A	AREAS OF 100-YEAR FLOOD; BASE FLOOD ELEVATIONS AND FLOOD HAZARD FACTORS NOT DETERMINED.
X (UNSHADED)	AREAS WHERE THERE IS MINIMAL FLOODING.

THE PROPOSED SOLAR PANELS ARE LOCATED ENTIRELY WITHIN ZONE X AND NO FILLING OR GRADING WITHIN THE 100-YEAR FLOODPLAIN IS PROPOSED.

5. AREA INFORMATION:

SITE WITHIN	YES/NO
GROUNDWATER PROTECTION AREA (RIDEM)	NO
NATURAL HERITAGE AREAS (RIDEM)	NO
HISTORIC CEMETERY AREA (CITY/TOWN)	NO
HISTORIC DISTRICT (CITY/TOWN)	NO
OVERLAY DISTRICT (CITY/TOWN)	YES*
GROUNDWATER RESERVOIR AREA (CITY/TOWN)	YES
GROUNDWATER RECHARGE AREA (CITY/TOWN)	YES

*SITE IS LOCATED IN AN AGRICULTURAL OVERLAY AND AQUIFER OVERLAY DISTRICT

6. SOIL INFORMATION:

SOIL NAME	HSG	ACREAGE	DESCRIPTION
AfA*	B	1.97 AC	AGAWAM FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
EfA*	B	14.31 AC	ENFIELD SILT LOAM, 0 TO 3 PERCENT SLOPES
EfB	B	1.68 AC	ENFIELD SILT LOAM, 3 TO 8 PERCENT SLOPES
HkA	A	3.30 AC	HINCKLEY GRAVELLY SANDY LOAM, 0 TO 3 PERCENT SLOPES
HkC	A	5.17 AC	HINCKLEY GRAVELLY SANDY LOAM, ROLLING
Nt*	C	2.29 AC	NINIGRET FINE SANDY LOAM
Ss*	B	3.39 AC	SUDBURY SANDY LOAM
Wa	D	9.65 AC	WALPOLE SANDY LOAM
	TOTAL:	41.76 AC	

*PRIME AGRICULTURAL SOILS

THE SOIL ABBREVIATIONS REFERENCE THE SOIL SURVEY OF RHODE ISLAND,PREPARED BY THE USDA SOIL CONSERVATION SERVICE INFORMATION FOUND THROUGH ONLINE RESEARCH FROM RIGIS DATA. THE ABBREVIATIONS CORRESPOND TO SOIL AREAS OUTLINED ON THE PLAN AND ARE TO BE CONSIDERED APPROXIMATE BASED ON RIGIS DATABASE

7. ZONING INFORMATION:

EXISTING ZONE (TABLE 18.20.010)	ZONE R-3 (SINGLE-FAMILY DWELLING)	PROPOSED
MINIMUM LOT AREA:	3 ACRES	41.76± ACRES
MINIMUM FRONTAGE:	300'	2,580'±
MINIMUM FRONT YARD:	50'	N/A
MINIMUM FRONT YARD (SOLAR):	50'	52.3'
MINIMUM SIDE YARD:	35'	N/A
MINIMUM SIDE YARD (SOLAR):	50'	77.7'
MINIMUM REAR YARD:	100'	N/A
MINIMUM REAR YARD (SOLAR):	50'	207.2'
MAXIMUM HEIGHT OF MAIN STRUCTURE:	35'	N/A
MAXIMUM BUILDING COVERAGE:	10%	N/A
MAXIMUM HEIGHT OF SOLAR PANEL:	12'	<12'
MINIMUM SOLAR FIELD COVERAGE:	11 ACRES	23.93± ACRES*

*AREA WITHIN LIMITS OF PROPOSED FENCE. SOLAR ARRAY-19.34± ACRES; SOLAR PANELS ONLY- 9.94± ACRES.

8. WETLANDS WERE DELINEATED ONSITE BY MASON & ASSOCIATES, INC., 771 PLAINFIELD PIKE, NORTH SCITUATE, RI 02857 ON FEBRUARY 23, 2018.

9. EXISTING CONDITIONS WITHIN THE PROPERTY WERE DETERMINED BY ONLINE INFORMATION, AERIAL MAPPING, THE RIGIS DATABASE AND A SITE WALK PERFORMED ON APRIL 9, 2018. THE PROPERTY BOUNDARY IS TAKEN FROM A CLASS I SURVEY PREPARED BY NATIONAL SURVEYORS-DEVELOPERS, INC. PREPARED ON APRIL 12, 2018 BASED ON A SURVEY PERFORMED BETWEEN APRIL 6, 2018 AND APRIL 12, 2018.

10. ON SITE SOIL EVALUATIONS WERE PERFORMED BY DIPRETE ENGINEERING, 2 STAFFORD COURT, CRANSTON, RI 02920 ON APRIL 11, 2018.

11. TOPOGRAPHY SHOWN ON THE PLAN IS LIDAR AND WAS OBTAINED BY RIGIS DATABASE. ELEVATIONS IN U.S. SURVEY FEET ARE REFERENCED TO NAVD88 DATUM.

12. THERE ARE NO HISTORICAL CEMETERIES LOCATED ON SITE BASED ON THE RHODE ISLAND HISTORICAL CEMETERY COMMISSION WEBSITE AND RESOURCES.

13. THE FACILITY IS NOT LOCATED IN A CONSERVATION EASEMENT, PRESERVATION EASEMENT, OR HAS ANY DEED RESTRICTIONS. THE ENTIRE PROPERTY WILL BE REMOVED FROM FARM, FOREST, OPEN SPACE DESIGNATION PRIOR TO CONSTRUCTION.

Certification Note:

THE BOUNDARY LINE SHOWN ON THIS PLAN DEPICTS A CLASS I BOUNDARY PROVIDED BY NATIONAL SURVEYORS-DEVELOPERS, INC. DATED APRIL 2018. THIS PLAN ITSELF IS NOT TO BE CONSTRUED AS AN ACCURATE BOUNDARY SURVEY AND IS SUBJECT TO SUCH CHANGES AS AN ACCURATE BOUNDARY SURVEY MAY DISCLOSE. ONLINE INFORMATION FROM RECORDED DATA AND EXISTING MAPS FROM THE TOWN AND STATE, AND RIGIS DATABASE WAS USED TO COMPILE THIS PLAN. DUE TO THE ACCURACY LEVELS OF SAID DATA AND MAPS, THIS PLAN IS TO BE CONSIDERED APPROXIMATE UNLESS SPECIFIED THAT ACTUAL FIELD SURVEY AND DEED RESEARCH HAS BEEN CONDUCTED.

Existing Conditions Legend

PROPERTY LINE
SETBACK LINE
ASSESSOR LINE
GIS WETLAND LINE
WETLAND HATCH
190 WETLAND FLAG AND WETLAND LINE
50' PERIMETER WETLAND LINE
SURVEYED STREAM/RIVER LINE
200' RIVERBANK WETLAND LINE
EDGE OF PAVEMENT
PAVEMENT HATCH
TH8 GWT=36"± TEST HOLE LOCATION
USDA SOIL LINE
EfB USDA SOIL TYPE
FEMA LINE
ZONE LINE
R-3 Zone ZONE CLASSIFICATION
TREE LINE
UP UTILITY POLE
100 MAJOR CONTOURS AND LABELS
100 MINOR CONTOURS AND LABELS
EASEMENT LINE & HATCH
2 MILE RADIUS FROM SUBSTATION

3760 Quaker Lane
North Kingstown, RI 02852
(401) 295-4998
www.green-ri.com
GREEN development, LLC

APPLICANT INFO: GD Richmond Beaver River I, LLC
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

OWNER INFO: William M. Stamp Jr, Trustee
ONE STAMP PLACE, EXETER, RI 02882

PREPARED BY: Green Development, LLC
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

No.	DATE	REVISION	BY
6	5/9/2019	TOWN RESUBMISSION	RBS
5	5/1/2019	RIDEM RESUBMISSION	RBS
4	12/7/2018	RIDEM RESUBMISSION	RBS
3	5/15/2018	TOWN PLANNER REVIEW COMMENTS	RBS
2	5/11/2018	TOWN PLANNER REVIEW COMMENTS	RBS
1	4/18/2018	DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION	RBS

SHEET TITLE:
Existing Site Analysis Plan

PROJECT INFORMATION:
GD Richmond Beaver River I
DIRECT CURRENT(DC): 7.45MW | ALTERNATING CURRENT(AC): 5.25MW
172 BEAVER RIVER ROAD, RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

KEVIN C. MORIN
No. 7951
5/9/2019
REGISTERED PROFESSIONAL ENGINEER CIVIL

SHEET NO.:
C1.3 OF 11

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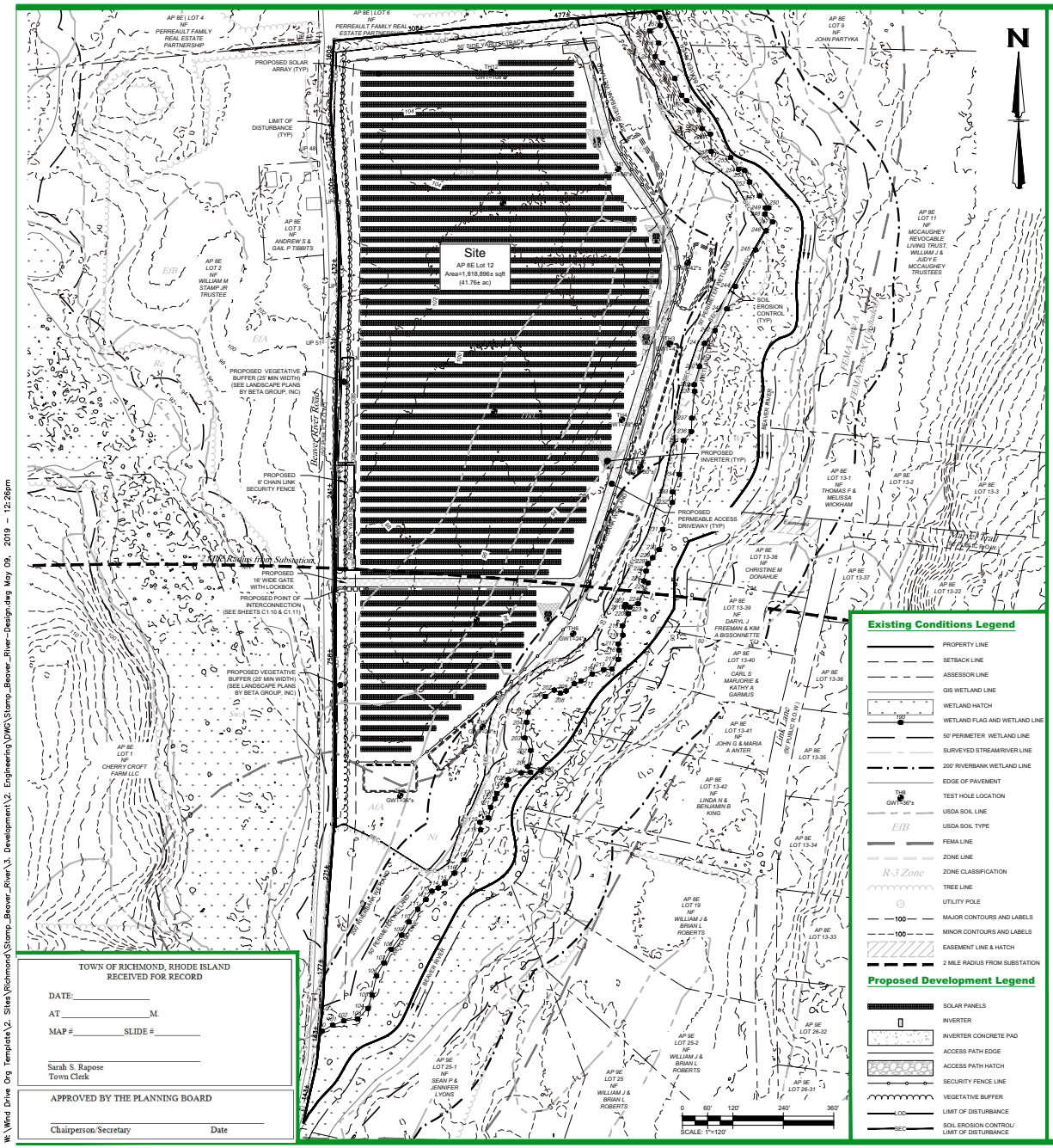

Development Information:

1. APPLICANT INFORMATION: GD RICHMOND BEAVER RIVER I, LLC
3760 QUAKER LANE
NORTH KINGSTOWN, RHODE ISLAND 02852

2. OWNER INFORMATION: WILLIAM M. STAMP JR, TRUSTEE
ONE STAMP PLACE
EXETER, RHODE ISLAND 02882

3. SITE INFORMATION: 172 BEAVER RIVER ROAD
RICHMOND, RHODE ISLAND, 02812
ASSESSOR'S PLAT 9E, LOT 12
AREA: 41.76± ACRES
ZONE: R-3 (RESIDENTIAL, 3 ACRE MINIMUM)

4. REQUIRED PERMITS: SPECIAL USE PERMIT - ZONING (TOWN)
DEVELOPMENT PLAN REVIEW - PLANNING (TOWN)
FRESHWATER WETLANDS/RIPDES - RIDEM (STATE)

5. PANEL INFORMATION:

MODEL:	JA SOLAR (JAM6K-72-360PR)
CAPACITY (PER PANEL):	360 W
DIMENSIONS (PER PANEL):	39 X 77.2 IN

6. ARRAY INFORMATION:

PANEL COUNT:	20,700
TOTAL AREA (PANELS ONLY):	9.94± ACRES
TOTAL AREA (SOLAR ARRAY):	19.34± ACRES
TOTAL AREA (WITHIN FENCE):	23.93± ACRES
TOTAL AREA (LOD):	31.12± ACRES
DIRECT CURRENT(DC):	7,452,000 W (7.45 MW)
ALTERNATING CURRENT(AC):	5,250,000 W (5.25 MW)
ARRAY TYPE:	FIXED
AZIMUTH (DEG):	180°
TILT(DEG):	25°

7. TRANSFORMER INFORMATION:

TOTAL TRANSFORMER COUNT:	6
1000kVA TRANSFORMER:	4
750kVA TRANSFORMER:	1
500kVA TRANSFORMER:	1

8. INVERTER INFORMATION:

TOTAL INVERTER COUNT:	10
SOLECTRIA XTM 500 INVERTER:	9
SOLECTRIA XTM 750 INVERTER:	1

9. FEMA INFORMATION: THE SITE IS LOCATED WITHIN ZONE X AND ZONE A AS DELINEATED ON THE FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF RICHMOND, WASHINGTON COUNTY. FIRM MAP NUMBERS, REVISION DATES AND ZONE DESCRIPTIONS ARE AS FOLLOW:

FIRM MAP NUMBER	FIRM MAP REVISION DATE
44009C0160H	OCTOBER 19, 2010
44009C0180H	OCTOBER 19, 2010
44009C0178H	OCTOBER 19, 2010
44009C0159H	OCTOBER 19, 2010

ZONE	DESCRIPTION
A	AREAS OF 100-YEAR FLOOD; BASE FLOOD ELEVATIONS AND FLOOD HAZARD FACTORS NOT DETERMINED.
X (UNSHADED)	AREAS WHERE THERE IS MINIMAL FLOODING.

THE PROPOSED SOLAR PANELS ARE LOCATED ENTIRELY WITHIN ZONE X AND NO FILLING OR GRADING WITHIN THE 100-YEAR FLOODPLAIN IS PROPOSED.

10. AREA INFORMATION:

SITE WITHIN	YES/NO
GROUNDWATER PROTECTION AREA (RIDEM)	NO
NATURAL HERITAGE AREAS (RIDEM)	NO
HISTORIC CEMETERY AREA (CITY/TOWN)	NO
HISTORIC DISTRICT (CITY/TOWN)	NO
OVERLAY DISTRICT (CITY/TOWN)	YES*
GROUNDWATER RESERVOIR AREA (CITY/TOWN)	YES
GROUNDWATER RECHARGE AREA (CITY/TOWN)	YES

*SITE IS LOCATED IN AN AGRICULTURAL OVERLAY AND AQUIFER OVERLAY DISTRICT

11. SOIL INFORMATION:

SOIL NAME	HSG	ACREAGE	DESCRIPTION
AfA*	B	1.97 AC	AGAWAM FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
EfA*	B	14.31 AC	ENFIELD SILT LOAM, 0 TO 3 PERCENT SLOPES
EfB	B	1.68 AC	ENFIELD SILT LOAM, 3 TO 8 PERCENT SLOPES
HkA	A	3.30 AC	HINCKLEY GRAVELLY SANDY LOAM, 0 TO 3 PERCENT SLOPES
HkC	A	5.17 AC	HINCKLEY GRAVELLY SANDY LOAM, ROLLING
NI*	C	2.29 AC	NINIGRET FINE SANDY LOAM
Sx*	B	3.39 AC	SUDBURY SANDY LOAM
Wa	D	9.65 AC	WALPOLE SANDY LOAM
	TOTAL:	41.76 AC	

*PRIME AGRICULTURAL SOILS

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MINIMUM FRONTAGE:	300'	2,580'±
MINIMUM FRONT YARD:	50'	N/A
MINIMUM FRONT YARD (SOLAR):	50'	52.3'
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MINIMUM REAR YARD:	100'	N/A
MINIMUM REAR YARD (SOLAR):	50'	207.2'
MAXIMUM HEIGHT OF MAIN STRUCTURE:	35'	N/A
MAXIMUM BUILDING COVERAGE:	10%	N/A
MAXIMUM HEIGHT OF SOLAR PANEL:	12'	<12'
MINIMUM SOLAR FIELD COVERAGE:	11 ACRES	23.93± ACRES*

*AREA WITHIN LIMITS OF PROPOSED FENCE. SOLAR ARRAY-19.34± ACRES; SOLAR PANELS ONLY- 9.94± ACRES.

13. WETLANDS WERE DELINEATED ONSITE BY MASON & ASSOCIATES, INC., 771 PLAINFIELD PIKE, NORTH SCITUATE, RI 02857 ON FEBRUARY 23, 2018.

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17. THERE ARE NO HISTORICAL CEMETERIES LOCATED ON SITE BASED ON THE RHODE ISLAND HISTORICAL CEMETERY COMMISSION WEBSITE AND RESOURCES.

18. THE FACILITY IS NOT LOCATED IN A CONSERVATION EASEMENT, PRESERVATION EASEMENT, OR HAS ANY DEED RESTRICTIONS. THE ENTIRE PROPERTY WILL BE REMOVED FROM FARM, FOREST, OPEN SPACE DESIGNATION PRIOR TO CONSTRUCTION.

19. THIS PLAN SET REFERENCES RHODE ISLAND DEPARTMENT OF TRANSPORTATION (RIDOT) STANDARD DETAILS WHICH CAN BE FOUND ON THE RIDOT ONLINE DATABASE. DESIGNATED DETAILS ARE LABELED WITHIN IN THIS PLAN SET AS RIDOT STD X.X.X. REFERENCE LINK: HTTP://WWW.DOT.RI.GOV/DOCUMENTS/DOINGBUSINESS/RIDOT_STD_DETAILS.PDF

20. NO TOPSOIL OR PRIME AGRICULTURAL SOIL, AS DEFINED IN CHAPTER 18.08, SHALL BE REMOVED FROM THE SITE FOR INSTALLATION OF THE FACILITY.

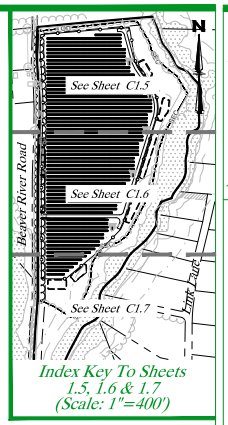
21. THE EXISTING ON SITE DWELLING IS SERVICED BY PRIVATE WELL AND PRIVATE SEPTIC. THE EXISTING DWELLING IS TO BE REMOVED AND DISPOSED ENTIRELY. THE EXISTING PRIVATE WELL AND PRIVATE OWTS ARE TO BE ABANDONED IN ACCORDANCE WITH RIDOH AND RIDEM REQUIREMENTS.

22. THIS PROJECT IS PROPOSED TO BE BUILT IN 1 PHASE.

23. NO OUTDOOR LIGHTING IS PROPOSED FOR THIS PROJECT.

24. NO SIGNAGE IS PROPOSED FOR THIS PROJECT EXCEPT REQUIRED WARNING SIGNAGE PER ELECTRIC CODE AND NATIONAL GRID REQUIREMENTS.

25. AS PER DEVELOPMENT PLAN CHECKLIST ITEM 17 THE FOLLOWING SUMMARY OF AREAS IS PROVIDED:
- AREA OF SOLAR PANELS - 432,803 SQ.FT.
- AREA OF PERMEABLE ACCESS DRIVEWAY - 42,620 SQ.FT.
- AREA OF CONCRETE PADS FOR ELECTRICAL EQUIPMENT - 1,850 SQ.FT.
- AREA WITH PERIMETER FENCE (INCLUSIVE OF THE ABOVE) - 1,042,244 SQ.FT.
- SEE BETA PLANS FOR LANDSCAPED AREA



Index Key To Sheets 1.5, 1.6 & 1.7 (Scale: 1"=400')

GREEN development, LLC
3760 Quaker Lane
North Kingstown, RI 02852
(401) 295-4998
www.green-ri.com

APPLICANT INFO: GD Richmond Beaver River I, LLC
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

OWNER INFO: William M. Stamp Jr. Trustee
ONE STAMP PLACE, EXETER, RI 02882

PREPARED BY: Green Development, LLC
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

No.	DATE	REVISION	BY
6	5/9/2019	TOWN RESUBMISSION	RES
5	5/7/2019	RIDOH RESUBMISSION	RES
4	12/7/2018	RIDOH RESUBMISSION	RES
3	9/7/2018	TOWN PLANNER REVIEW COMMENTS	RES
2	5/11/2018	TOWN PLANNER REVIEW COMMENTS	RES
1	4/19/2018	DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION	RES

SHEET TITLE:
Proposed Site Plan

PROJECT INFORMATION:
GD Richmond Beaver River I
DIRECT CURRENT(DC): 7.45MW | ALTERNATING CURRENT(AC): 5.25MW
172 BEAVER RIVER ROAD, RICHMOND, RI 02812
ASSESSOR'S PLAT 9E LOT 12

KEVIN C. MORIN
No. 9851
REGISTERED PROFESSIONAL ENGINEER
CIVIL
5/9/2019

SHEET NO.:
C1.4 OF 11

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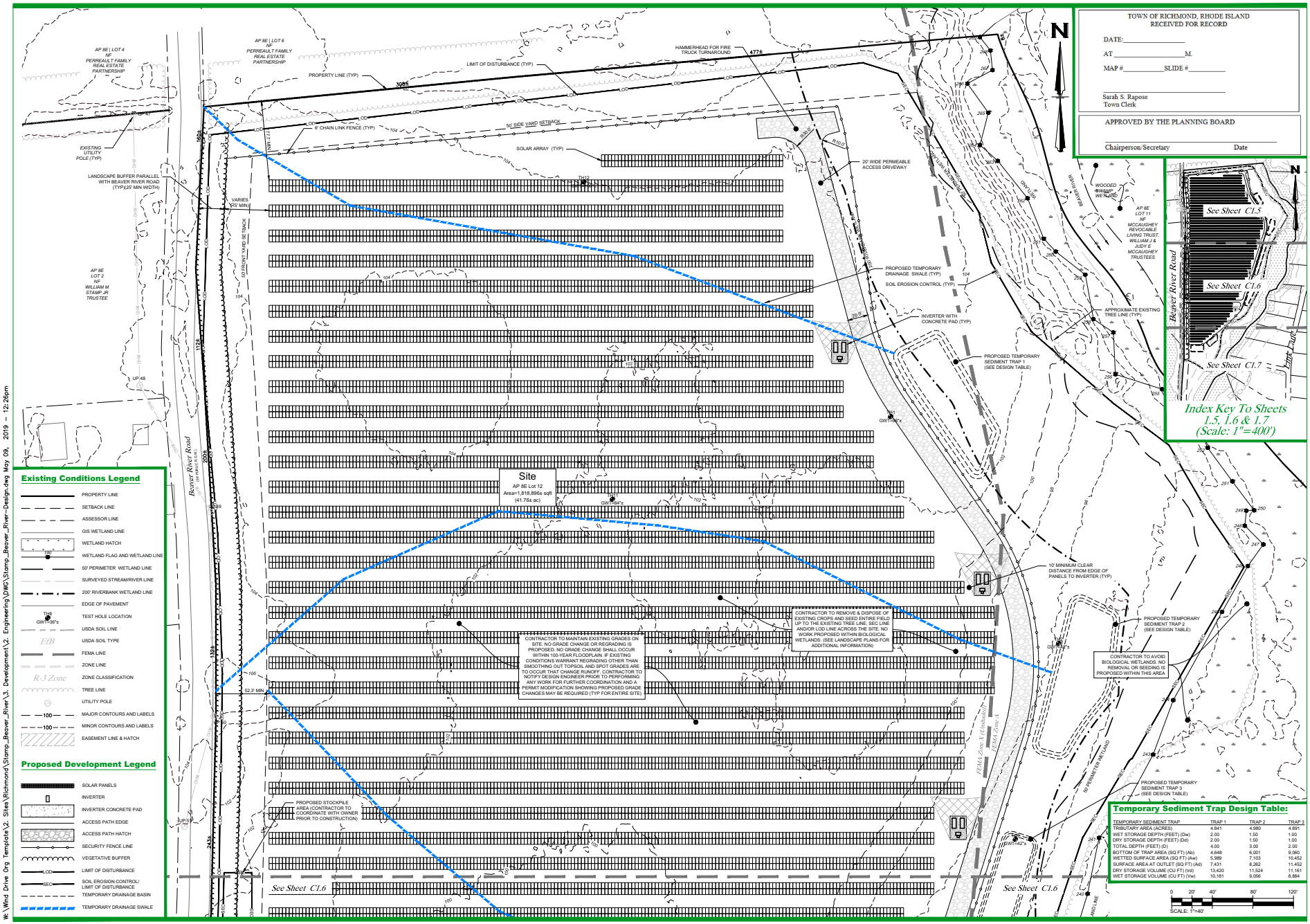

Temporary Sediment Trap Design Table:

TEMPORARY SEDIMENT TRAP	TRAP 1	TRAP 2	TRAP 3
TRIBUTARY AREA (ACRES)	4.841	4.980	4.891
WET STORAGE DEPTH (FEET) (Dw)	2.00	1.50	1.00
DRY STORAGE DEPTH (FEET) (Dd)	2.00	1.50	1.00
TOTAL DEPTH (FEET) (D)	4.00	3.00	2.00
BOTTOM OF TRAP AREA (SQ FT) (Ab)	4,648	6,001	9,060
WETTED SURFACE AREA (SQ FT) (Aw)	5,989	7,103	10,452
SURFACE AREA AT OUTLET (SQ FT) (Ad)	7,431	8,262	11,452
DRY STORAGE VOLUME (CU FT) (Vd)	13,420	11,524	11,161
WET STORAGE VOLUME (CU FT) (Vw)	10,181	9,056	8,884

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PREPARED BY: Green Development, LLC
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

No.	DATE	REVISION	BY
6	5/9/2019	TOWN RESUBMISSION	RES
5	5/7/2019	RIDEM RESUBMISSION	RES
4	12/7/2018	RIDEM RESUBMISSION	RES
3	9/17/2018	TOWN PLANNER REVIEW COMMENTS	RES
2	8/7/2018	TOWN PLANNER REVIEW COMMENTS	RES
1	4/19/2018	DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION	RES

SHEET TITLE:
Enlarged Site, Grading & Utility Plan - 1

PROJECT INFORMATION:
GD Richmond Beaver River I
DIRECT CURRENT(DC): 7.45MW | ALTERNATING CURRENT(AC): 5.25MW
172 BEAVER RIVER ROAD, RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

KEVIN C. MORIN
No. 9851
REGISTERED PROFESSIONAL ENGINEER
CIVIL
5/9/2019

SHEET NO.:
C1.5 OF 11

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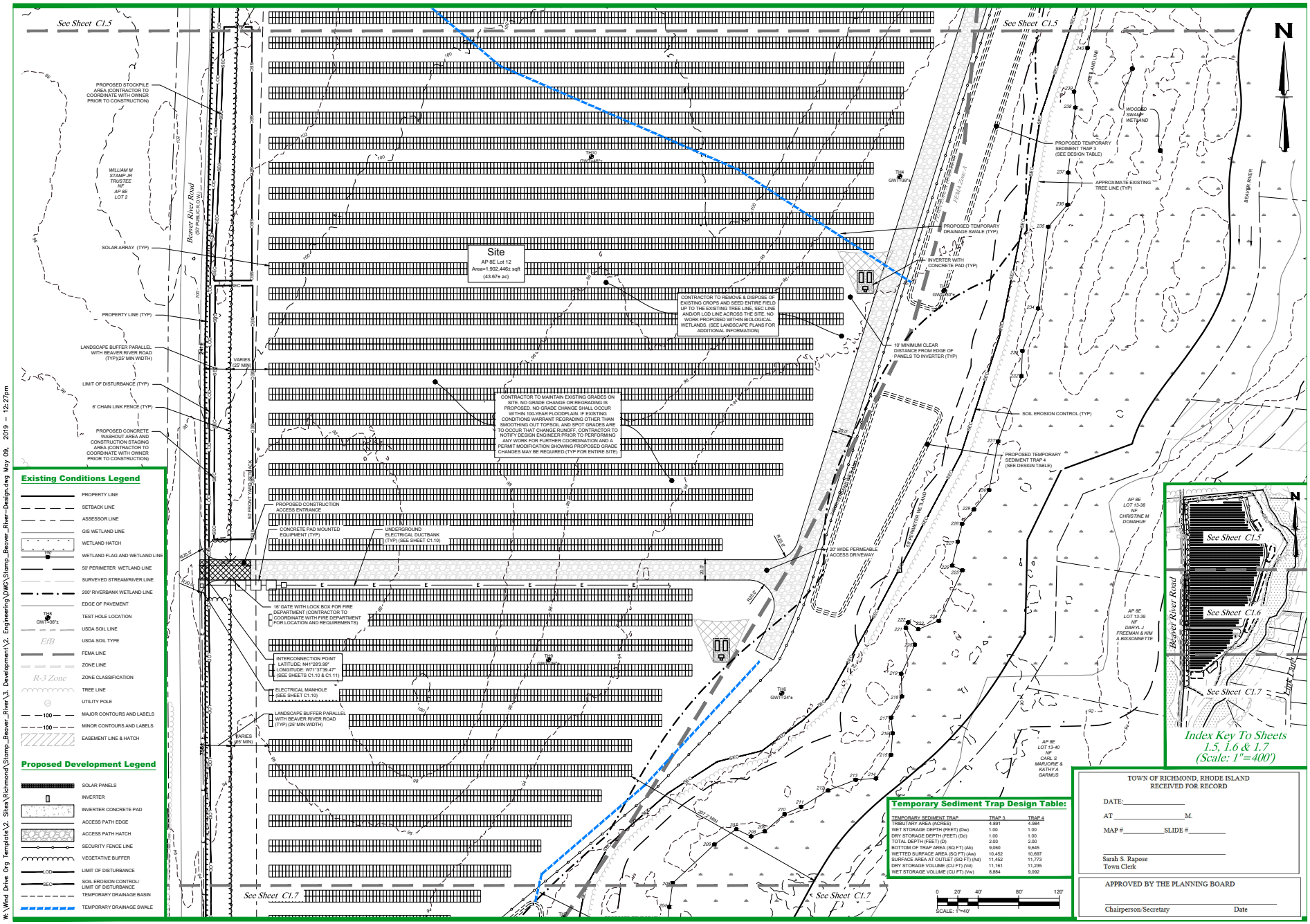

Existing Conditions Legend

- PROPERTY LINE
- SETBACK LINE
- ASSESSOR LINE
- GIS WETLAND LINE
- WETLAND HATCH
- WETLAND FLAG AND WETLAND LINE
- 50' PERIMETER WETLAND LINE
- SURVEYED STREAM/RIVER LINE
- 200' RIVERBANK WETLAND LINE
- EDGE OF PAVEMENT
- TEST HOLE LOCATION
- USDA SOIL LINE
- USDA SOIL TYPE
- FEMA LINE
- ZONE LINE
- ZONE CLASSIFICATION
- TREE LINE
- UTILITY POLE
- MAJOR CONTOURS AND LABELS
- MINOR CONTOURS AND LABELS
- EASEMENT LINE & HATCH

Proposed Development Legend

- SOLAR PANELS
- INVERTER
- INVERTER CONCRETE PAD
- ACCESS PATH EDGE
- ACCESS PATH HATCH
- SECURITY FENCE LINE
- VEGETATIVE BUFFER
- LOD — LIMIT OF DISTURBANCE
- SEC — SOIL EROSION CONTROL/ LIMIT OF DISTURBANCE
- TEMPORARY DRAINAGE BASIN
- TEMPORARY DRAINAGE SWALE

Temporary Sediment Trap Design Table:

TEMPORARY SEDIMENT TRAP	TRAP 3	TRAP 4
TRIBUTARY AREA (ACRES)	4.891	4.984
WET STORAGE DEPTH (FEET) (Dw)	1.00	1.00
DRY STORAGE DEPTH (FEET) (Dd)	1.00	1.00
TOTAL DEPTH (FEET) (D)	2.00	2.00
BOTTOM OF TRAP AREA (SQ FT) (Ab)	9,090	9,845
WETTED SURFACE AREA (SQ FT) (Aw)	10,452	10,697
SURFACE AREA AT OUTLET (SQ FT) (Ad)	11,452	11,773
DRY STORAGE VOLUME (CU FT) (Vd)	11,161	11,235
WET STORAGE VOLUME (CU FT) (Vw)	8,884	9,092

TOWN OF RICHMOND, RHODE ISLAND
RECEIVED FOR RECORD

DATE:_____

AT _____ M.

MAP #_____ SLIDE #_____

Sarah S. Rapose
Town Clerk

APPROVED BY THE PLANNING BOARD

Chairperson/Secretary Date

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2	5/7/2018	TOWN PLANNER REVIEW COMMENTS	RES
1	4/19/2018	DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION	RES

SHEET TITLE:
Enlarged Site, Grading & Utility Plan - 2

PROJECT INFORMATION:
GD Richmond Beaver River I
DIRECT CURRENT(DC)-7.45MW | ALTERNATING CURRENT(AC)-5.25MW
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ASSESSOR'S PLAT 8E LOT 12

KEVIN C. MORIN
No. 9851
REGISTERED PROFESSIONAL ENGINEER
CIVIL
5/9/2019

SHEET NO.:
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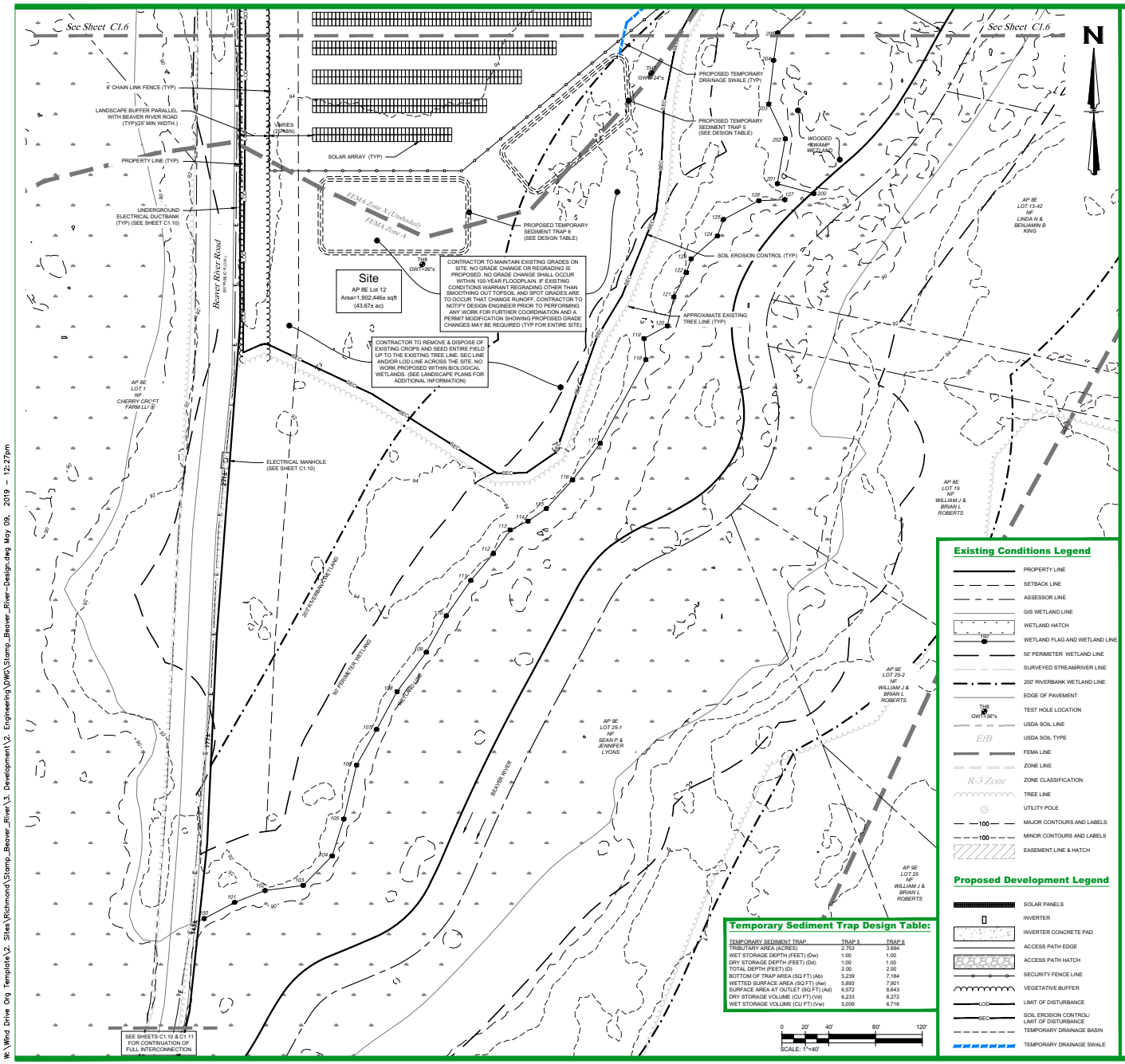

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- TEMPORARY DRAINAGE SWALE

Temporary Sediment Trap Design Table:

TEMPORARY SEDIMENT TRAP	TRAP 5	TRAP 6
TRIBUTARY AREA (ACRES)	2.753	3.694
WET STORAGE DEPTH (FEET) (Dw)	1.00	1.00
DRY STORAGE DEPTH (FEET) (Dd)	1.00	1.00
TOTAL DEPTH (FEET) (D)	2.00	2.00
BOTTOM OF TRAP AREA (SQ FT) (Ab)	5,239	7,184
WETTED SURFACE AREA (SQ FT) (Aw)	5,893	7,901
SURFACE AREA AT OUTLET (SQ FT) (Ad)	6,572	8,643
DRY STORAGE VOLUME (CU FT) (Vd)	6,233	8,272
WET STORAGE VOLUME (CU FT) (Vw)	5,009	6,716

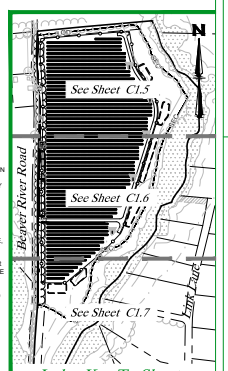
Notes:

1. CONSTRUCTION IS ANTICIPATED TO BEING IN THE SUMMER OF 2018 OR ONCE ALL NECESSARY APPROVALS HAVE BEEN ACQUIRED.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION BETWEEN THE APPROPRIATE UTILITY COMPANIES FOR AGREEMENTS TO SERVICE THE PROPOSED FACILITY. ALL PROPOSED OVERHEAD AND UNDERGROUND UTILITIES CORRESPONDING TO THE INSTALLATION OF THE SOLAR FIELD SHALL BE COORDINATED WITH THE APPLICANT AND DESIGN ENGINEER PRIOR TO INSTALLATION.
3. CONTRACTOR TO VERIFY EXISTING GRADES AT TIE-IN LOCATIONS WITH PROPOSED ACCESS PATH TO ENSURE PROPER INSTALLATION AND TRANSITION BETWEEN THE EXISTING CONDITIONS AND PROPOSED FACILITY.
4. SEE SEQUENCE OF CONSTRUCTION BELOW FOR ABBREVIATED INSTRUCTIONS. CONTRACTOR TO REFER TO THE SESC FOR FULL SEQUENCE OF CONSTRUCTION ACTIVITIES, PROJECT PHASING AND ADDITIONAL INFORMATION. CONTRACTOR MAY MODIFY SEQUENCE OF CONSTRUCTION AS FIELD CONDITIONS WARRANT WITH THE APPROVAL FROM THE DESIGN ENGINEER.
5. CONTRACTOR IS RESPONSIBLE FOR ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES ON SITE SHOW ON THE PLANS. CONTRACTOR TO NOTIFY THE DIRECTOR OF RICHMOND PUBLIC WORKS, THE TOWN OF RICHMOND ENGINEERING DEPARTMENT, RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND DESIGN ENGINEER A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
6. ALL EXISTING UTILITIES SHOWN ARE FROM VISIBLE INFORMATION, DRAWINGS FROM OTHERS, RIGIS DATA, SURVEYED INFORMATION AND/OR INFORMATION PROVIDED TO GREEN DEVELOPMENT AND IS SUBJECT TO CHANGE AND ARE TO BE CONSIDERED APPROXIMATE ONLY. PRIOR TO CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE TO CONTACT THE PROPER UTILITY ENGINEERING DEPARTMENTS AND COMPANIES TO LOCATE ALL EXISTING SUBSURFACE UTILITIES AND STRUCTURES IN AND AROUND THE LIMIT OF DISTURBANCE.
7. CONTRACTOR TO CALL THE DIG SAFE CENTER TOLL FREE AT 1-888-344-7233, 72 HOURS PRIOR TO ANY EXCAVATION WORK TAKES PLACE. CONTRACTOR TO NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES FOUND DURING UTILITY RESEARCH PRIOR TO EXCAVATION. ANY DAMAGE TO ANY EXISTING UTILITIES WHICH ARE SHOWN AND NOT SHOWN ON THE PLANS OR DETAILED BY DIG SAFE SHALL BE THE RESPONSIBILITY OF THE SITE CONTRACTOR.
8. CONTRACTOR IS LIABLE TO OBTAIN ALL MUNICIPAL, STATE AND FEDERAL APPROVALS AND PERMITS PRIOR TO THE START OF CONSTRUCTION.
9. DAILY SWEEPING AT CONSTRUCTION ENTRANCE DURING DEMOLITION AND CONSTRUCTION IS REQUIRED TO MINIMIZE SEDIMENTS ON BEAVER RIVER ROAD. THE CONTRACTOR SHALL PROVIDE STORAGE FOR WATER AS NECESSARY TO ENSURE PROPER DUST CONTROL.
10. CONTRACTOR IS RESPONSIBLE FOR REMOVING AND DISPOSING (R&D) OF ALL MATERIALS LEGALLY AS INDICATED ON THE PLANS TO AN APPROVED OFF-SITE LOCATION.
11. CONTRACTOR'S STOCKPILE AND STAGING AREAS WITHIN THE LIMIT OF DISTURBANCE SHALL BE RESTORED TO MATCH PRIOR CONDITIONS OR PROPOSED CONDITIONS SHOWN ON THE PLANS.
12. NO OUTDOOR STORAGE IS PROPOSED EXCEPT FOR TEMPORARY STORAGE FOR MATERIALS DURING CONSTRUCTION. SEE SHEET C1.6 FOR STOCKPILE AND STAGING AREA LOCATION.
13. THIS PLAN SET REFERENCES RHODE ISLAND DEPARTMENT OF TRANSPORTATION (RIDOT) STANDARD DETAILS WHICH CAN BE FOUND ON THE RIDOT ONLINE DATABASE. DESIGNATED DETAILS ARE LABELED WITHIN IN THIS PLAN SET AS RIDOT STD X.X.X.

    REFERENCE LINK: HTTP://WWW.DOT.RI.GOV/DOCUMENTS/DOINGBUSINESS/RIDOT_STD_DETAILS.PDF
14. NO TOPSOIL OR PRIME AGRICULTURAL SOIL SHALL BE REMOVED FROM THE SITE FOR INSTALLATION OF THE FACILITY.
15. CONTRACTOR TO PERFORM ALL WORK IN ACCORDANCE WITH THE RHODE ISLAND STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRICTION AND THE TOWN OF RICHMOND STANDARDS SPECIFICATIONS AND DETAILS.
16. THIS PROJECT IS PROPOSED TO BE BUILT IN 1 PHASE.
17. ALL STUMPS SHALL BE GROUND ONSITE OR REMOVED IN AN ACCEPTABLE MANNER OFF SITE. NO STUMP DUMPS ARE PROPOSED ON SITE FOR THIS PROJECT.
18. NO OUTDOOR LIGHTING IS PROPOSED FOR THIS PROJECT.
19. ALL CONCRETE WASHOUT AREAS MUST CONFORM TO RIDEM REGULATIONS. SEE SHEET C1.6 FOR CONCRETE WASHOUT AREA LOCATION.
20. NO SIGNAGE IS PROPOSED FOR THIS PROJECT EXCEPT REQUIRED WARNING SIGNAGE PER ELECTRIC CODE AND NATIONAL GRID REQUIREMENTS.
21. AS PER DEVELOPMENT PLAN CHECKLIST ITEM 17 THE FOLLOWING SUMMARY OF AREAS IS PROVIDED:
    - AREA OF SOLAR PANELS - 432,803 SQ.FT.
    - AREA OF PERMEABLE ACCESS DRIVEWAY - 42,620 SQ.FT.
    - AREA OF CONCRETE PADS FOR ELECTRICAL EQUIPMENT - 1,850 SQ.FT.
    - AREA WITH PERIMETER FENCE (INCLUSIVE OF THE ABOVE) - 1,042,244 SQ.FT.
    - SEE BETA PLANS FOR LANDSCAPED AREA

Sequence of Construction

1. SURVEY AND STAKE LIMIT OF SEDIMENTATION BARRIERS/LIMIT DISTURBANCE.
2. INSTALL PERIMETER EROSION CONTROL BARRIERS AS SHOWN ON THE PLANS ALONG LIMIT OF DISTURBANCE. IN NO CASE IS THE LIMIT OF DISTURBANCE TO EXTEND BEYOND THE SEDIMENTATION BARRIERS.
3. CLEAR BRUSH AND TREES ON SITE IF NECESSARY, WITHIN LIMIT OF DISTURBANCE. IN NO CASE IS THE LIMIT OF DISTURBANCE TO EXTEND BEYOND THE SEDIMENTATION BARRIERS OR CONSTRUCTION FENCING.
4. PRIOR TO REMOVAL OF STUMPS AND SOIL DISTURBANCE, INSTALL TEMPORARY SEDIMENT SWALE AND TRAPS AS PER PLANS. ALL TEMPORARY CONTROL DEVICES SHALL BE INSTALLED PER THE RHODE ISLAND SOIL EROSION AND SEDIMENTATION CONTROL HANDBOOK.
5. GRUB AND REMOVE TREE STUMPS ON SITE IF NECESSARY. TOPSOIL IS TO BE STRIPPED AND STOCKPILED IN APPROVED LOCATIONS SHOWN ON PLANS TO BE RE-USED FOLLOWING TEMPORARY GRADING ACTIVITIES FOR SOIL EROSION MEASURES. STOCKPILES ARE TO BE PROTECTED BY A ROW OF SILT FENCE AND COVERED OR TEMPORARILY SEEDED.
6. RE-GRADE SITE AS NECESSARY PER PLANS.
7. INSTALL SOLAR PROJECT INCLUDING BUT NOT LIMITED TO THE INSTALLATION OF THE RACKING SYSTEM, UNDERGROUND CONDUIT, EQUIPMENT PADS, ACCESS PATH, PANELS, NEW UTILITY POLES ON SITE, FENCING, ETC. AS REQUIRED BY APPROVED PLANS.
8. ONCE ROUGH GRADE ON THE SITE HAS BEEN ESTABLISHED AND SOLAR PANELS/EQUIPMENT HAS BEEN INSTALLED, DISTURBED AREAS SHALL BE LOAMED AND SEEDED TO RE-ESTABLISH VEGETATION.
9. TEMPORARY SEDIMENT CONTROLS AND TRAPS ARE TO BE MAINTAINED AND REMAIN UNTIL THE SITE IS STABILIZED.
10. IN THE EVENT THE DRIP EDGE AT PANELS RESULTS IN RILL EROSION, INSTALL PROTECTIVE MEASURES SUCH AS CRUSHED STONE, EROSION CONTROLS BLANKETS, ETC. AS NEEDED.
11. REMOVE ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES FOLLOWING FINAL VEGETATIVE ESTABLISHMENT OF ALL DISTURBED AREAS AND FULL SITE STABILIZATION.
12. IMPLEMENT LONG TERM OPERATION AND MAINTENANCE PLAN.



Index Key To Sheets 1.5, 1.6 & 1.7 (Scale: 1"=400')

TOWN OF RICHMOND, RHODE ISLAND
RECEIVED FOR RECORD

DATE:_____

AT _____M.

MAP #_____SLIDE #_____

Sarah S. Rapose
Town Clerk

APPROVED BY THE PLANNING BOARD

Chairperson/Secretary Date

GREEN development, LLC
3760 Quaker Lane
North Kingstown, RI 02852
(401) 295-4998
www.green-ri.com

APPLICANT INFO: GD Richmond Beaver River I, LLC
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

OWNER INFO: William M. Stamp Jr. Trustee
ONE STAMP PLACE, EXETER, RI 02882

PREPARED BY: Green Development, LLC
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

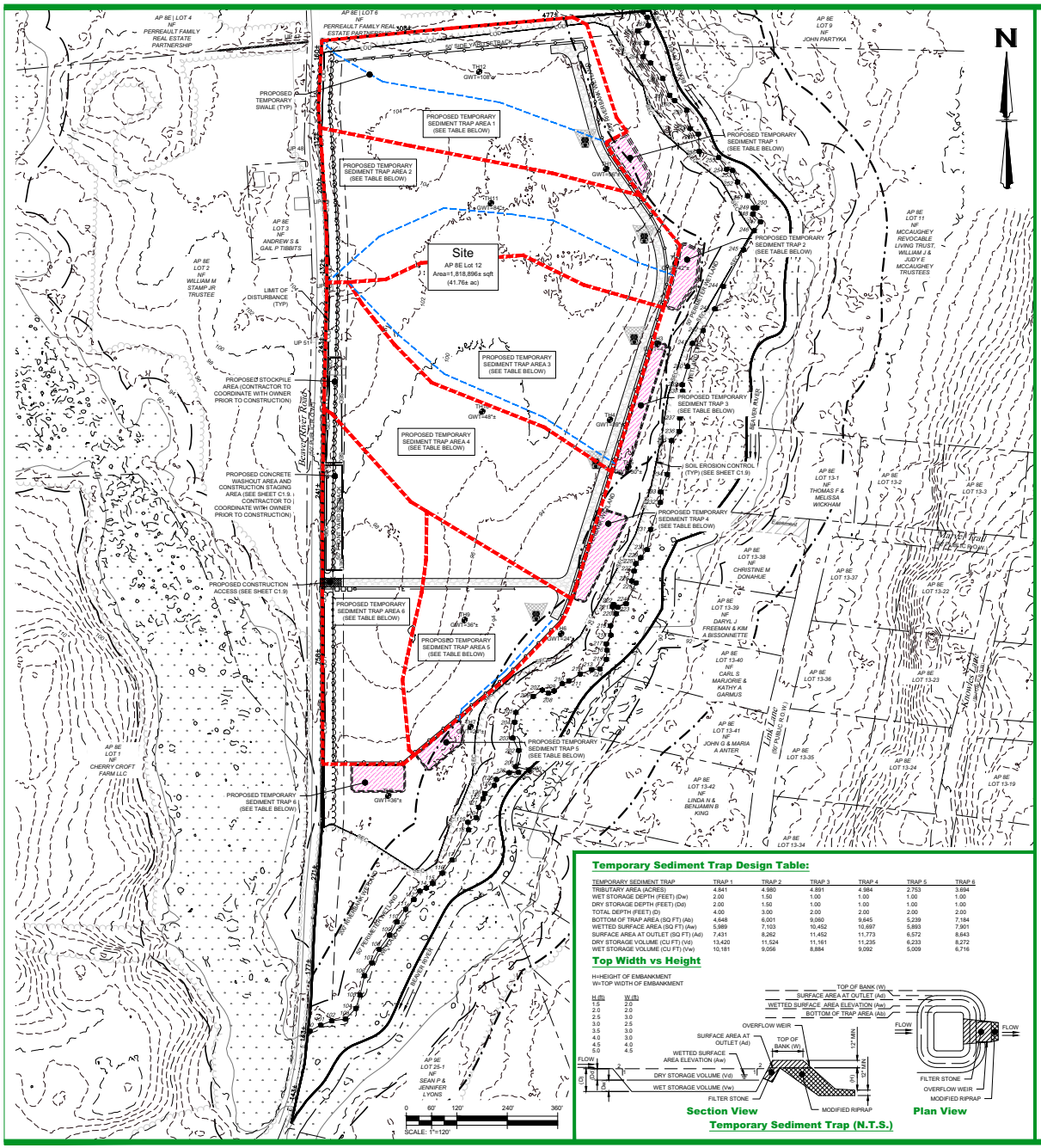
No.	DATE	REVISION	BY
6	5/9/2019	TOWN RESUBMISSION	RBS
5	5/7/2019	RIDEM RESUBMISSION	RBS
4	12/7/2018	RIDEM RESUBMISSION	RBS
3	9/7/2018	TOWN PLANNER REVIEW COMMENTS	RBS
2	5/7/2018	RIDEM RESUBMISSION	RBS
1	4/19/2018	DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION	RBS

SHEET TITLE:
Enlarged Site, Grading & Utility Plan - 3

PROJECT INFORMATION:
GD Richmond Beaver River I
DIRECT CURRENT(DC): 7.45MW | ALTERNATING CURRENT(AC): 5.25MW
172 BEAVER RIVER ROAD, RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

KEVIN C. MORIN
No. 9851
REGISTERED PROFESSIONAL ENGINEER
CIVIL
5/9/2019

SHEET NO.:
C1.7 OF 11



Temporary Sediment Trap Design Table:

TEMPORARY SEDIMENT TRAP	TRAP 1	TRAP 2	TRAP 3	TRAP 4	TRAP 5	TRAP 6
TRIBUTARY AREA (ACRES)	4.841	4.980	4.891	4.984	2.753	3.694
WET STORAGE DEPTH (FEET) (Dw)	2.00	1.50	1.00	1.00	1.00	1.00
DRY STORAGE DEPTH (FEET) (Dd)	2.00	1.50	1.00	1.00	1.00	1.00
TOTAL DEPTH (FEET) (D)	4.00	3.00	2.00	2.00	2.00	2.00
BOTTOM OF TRAP AREA (SQ FT) (Ab)	4,548	6,001	9,080	9,845	5,239	7,184
WETTED SURFACE AREA (SQ FT) (Aw)	5,989	7,103	10,452	10,697	5,893	7,901
SURFACE AREA AT OUTLET (SQ FT) (Ad)	7,431	8,262	11,452	11,773	6,572	8,643
DRY STORAGE VOLUME (CU FT) (Vd)	13,420	11,524	11,161	11,235	6,233	8,272
WET STORAGE VOLUME (CU FT) (Vw)	10,181	9,056	8,884	9,092	5,009	6,716

Top Width vs Height

H=HEIGHT OF EMBANKMENT
W=TOP WIDTH OF EMBANKMENT

H (ft)	W (ft)
1.5	2.0
2.0	2.0
2.5	3.0
3.0	2.5
3.5	3.0
4.0	3.0
4.5	4.0
5.0	4.5

Section View **Plan View**

Temporary Sediment Trap (N.T.S.)

Soil Erosion and Sediment Control Notes:

1. ACCOMPANYING DOCUMENTS: SOIL EROSION AND SEDIMENT CONTROL PLAN (SESC) WHICH CONTAINS THE FOLLOWING:
   - EROSION CONTROL MEASURES
   - SHORT TERM MAINTENANCE
   - ESTABLISHMENT OF VEGETATIVE COVER
   - CONSTRUCTION POLLUTION PREVENTION
   - SEQUENCE OF CONSTRUCTION

   OPERATIONS AND MAINTENANCE PLAN (O&M) WHICH CONTAINS THE FOLLOWING:
   - LONG TERM MAINTENANCE
   - LONG TERM POLLUTION PREVENTION

   THESE DOCUMENTS ARE TO BE CONSIDERED AS PART OF THE PROJECT PLANS AND THE CONTRACTOR AND OWNER MUST MAINTAIN CURRENT COPIES OF THE ABOVE DOCUMENTS AS PART OF A FULL PLAN SET.
2. CONTRACTOR TO REFER TO THE SESC FOR SEQUENCE OF CONSTRUCTION ACTIVITIES, PROJECT PHASING AND ADDITIONAL INFORMATION. CONTRACTOR MAY MODIFY SEQUENCE OF CONSTRUCTION WITH THE APPROVAL FROM THE DESIGN ENGINEER.
3. ALL EXISTING UTILITIES SHOWN ARE FROM VISIBLE INFORMATION, DRAWINGS FROM OTHERS, RIGIS DATA, SURVEYED INFORMATION AND/OR INFORMATION PROVIDED TO GREEN DEVELOPMENT AND IS SUBJECT TO CHANGE AND ARE TO BE CONSIDERED APPROXIMATE ONLY. PRIOR TO CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE TO CONTACT THE PROPER UTILITY ENGINEERING DEPARTMENTS AND COMPANIES TO LOCATE ALL EXISTING SUBSURFACE UTILITIES AND STRUCTURES IN AND AROUND THE LIMIT OF DISTURBANCE.
4. CONTRACTOR TO CALL THE DIG SAFE CENTER TOLL FREE AT 1-888-344-7233, 72 HOURS PRIOR TO ANY EXCAVATION WORK TAKES PLACE. CONTRACTOR TO NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES FOUND DURING UTILITY RESEARCH PRIOR TO EXCAVATION. ANY DAMAGE TO ANY EXISTING UTILITIES WHICH ARE SHOWN AND NOT SHOWN ON THE PLANS OR DETAILED BY DIG SAFE SHALL BE THE RESPONSIBILITY OF THE SITE CONTRACTOR.
5. CONTRACTOR IS LIABLE TO OBTAIN ALL MUNICIPAL, STATE AND FEDERAL APPROVALS AND PERMITS PRIOR TO THE START OF CONSTRUCTION.
6. DAILY SWEEPING AT CONSTRUCTION ENTRANCE DURING DEMOLITION AND CONSTRUCTION IS REQUIRED TO MINIMIZE SEDIMENTS ON BEAVER RIVER ROAD. THE CONTRACTOR SHALL PROVIDE STORAGE FOR WATER AS NECESSARY TO ENSURE PROPER DUST CONTROL.
7. CONTRACTOR IS RESPONSIBLE FOR REMOVING AND DISPOSING (R&D) OF ALL MATERIALS LEGALLY AS INDICATED ON THE PLANS TO AN APPROVED OFF-SITE LOCATION.
8. CONTRACTOR'S STOCKPILE AND STAGING AREAS WITHIN THE LIMIT OF DISTURBANCE SHALL BE RESTORED TO MATCH PRIOR CONDITIONS OR PROPOSED CONDITIONS SHOWN ON THE PLANS.
9. THIS PLAN SET REFERENCES RHODE ISLAND DEPARTMENT OF TRANSPORTATION (RIDOT) STANDARD DETAILS WHICH CAN BE FOUND ON THE RIDOT ONLINE DATABASE. DESIGNATED DETAILS ARE LABELED WITHIN IN THIS PLAN SET AS RIDOT STD X.X.X.

   REFERENCE LINK: HTTP://WWW.DOT.RI.GOV/DOCUMENTS/DOINGBUSINESS/RIDOT_STD_DETAILS.PDF
10. NO TOPSOIL OR PRIME AGRICULTURAL SOIL SHALL BE REMOVED FROM THE SITE FOR INSTALLATION OF THE FACILITY.
11. THIS PROJECT IS PROPOSED TO BE BUILT IN 1 PHASE.

Design Rules and Regulations:

THE TEMPORARY SEDIMENT TRAPS SHALL BE INSTALLED AND CONFORM TO ALL RULES AND REGULATIONS SET FORTH BY THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND DESCRIBED WITHIN THE THOSE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST REVISION, UNDER SECTION SIX FOR TEMPORARY SEDIMENT TRAPS.

APPLICABILITY: BELOW DISTURBED AREAS WHERE THE CONTRIBUTING DRAINAGE AREA IS 5 ACRES OR LESS - FOR DRAINAGE AREAS GREATER THAN 5 ACRES USE A TEMPORARY SEDIMENT BASIN.

WHERE THE INTENDED USE IS 6 MONTHS OR LESS. FOR USES EXTENDING BEYOND 6 MONTHS USE A TEMPORARY SEDIMENT BASIN.

REQUIREMENTS: THE TEMPORARY SEDIMENT TRAP HAS TWO STORAGE REQUIREMENTS AS FOLLOW:
WET STORAGE - CREATED BY EXCAVATION WITHIN A DRAINAGE WAY
DRY STORAGE - CREATED BY THE CONSTRUCTION OF A PERVIOUS STONE DIKE ACROSS THE DRAINAGE WAY

SEDIMENT IS REQUIRED TO BE REMOVED FROM THE TRAP WHEN THE SEDIMENT ACCUMULATION EXCEEDS HALF OF THE WET STORAGE VOLUME OF THE TRAP.

ACCESS IS TO BE PROVIDED TO THE TRAP FOR SEDIMENT REMOVAL. EXCAVATED SEDIMENT WILL BE REMOVED AND DISPOSED OF AT AN APPROVED OFF-SITE LOCATION OR ON THE EXISTING SITE.

THE TRAPS ARE TO BE INSTALLED PRIOR TO CONDUCTING ANY GRADING ACTIVITIES IN THE CONTRIBUTING WATERSHED AREAS AS SHOWN ON THE PLAN.

LOCATIONS: NOT TO BE LOCATED IN CLOSE PROXIMITY TO EXISTING OR PROPOSED BUILDING FOUNDATIONS.

LOCATE TRAPS TO OBTAIN MAXIMUM STORAGE BENEFIT FROM THE TERRAIN, FOR EASE OF CLEAN OUT AND DISPOSAL OF THE TRAPPED SEDIMENT.

TRAP CAPACITY: THE TRAP SHALL HAVE AN INITIAL STORAGE VOLUME OF 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA, HALF OF WHICH SHALL BE IN THE FORM OF WET STORAGE TO PROVIDE A STABLE SETTLING MEDIUM. THE REMAINING STORAGE VOLUME SHALL BE IN THE FORM OF A DRAWDOWN (DRY STORAGE) WHICH WILL PROVIDE EXTENDED SETTLING TIME DURING LESS FREQUENT, LARGER STORM EVENTS.
WET STORAGE - VOLUME SHALL BE MEASURED FROM THE LOW POINT OF THE EXCAVATED AREA TO THE BASE OF THE STONE OUTLET STRUCTURE.
DRY STORAGE - VOLUME SHALL BE MEASURED FROM THE BASE OF THE STONE OUTLET TO THE TOP OF THE STONE OUTLET (OVERFLOW MECHANISM)

THE TRAP SHALL BE SIZED TO STORE 1 INCH OF RUNOFF FROM THE CONTRIBUTING AREA OR PER THE SEDIMENT VOLUME METHOD (SEE EQUATION TABLE) IN ACCORDANCE WITH STANDARD 10 OF THE 2010 RHODE ISLAND STORMWATER DESIGN AND INSTALLATION STANDARDS MANUAL.

SLOPES: ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER EXCEPT FOR THE EXCAVATED WET STORAGE AREA WHERE SLOPES SHALL NOT EXCEED 1.5:1. THE MAXIMUM DEPTH OF EXCAVATION WITHIN THE WET STORAGE AREA SHOULD NOT EXCEED THREE (3) FEET TO FACILITATE CLEAN-OUT AND FOR SITE SAFETY CONSIDERATIONS.

INLETS/OUTLETS: THE OUTLET SHALL BE LOCATED AT THE MOST DISTANT HYDRAULIC POINT FROM THE INLET.

THE OUTLET CONSISTS OF A PERVIOUS STONE DIKE WITH A CORE OF MODIFIED RIPRAP AND FACED ON THE UPSTREAM SIDE WITH STONE AND MUST OUTLET ONTO STABILIZED GROUND.

EMBANKMENT: THE MAXIMUM HEIGHT OF A TEMPORARY SEDIMENT TRAP EMBANKMENT IS LIMITED TO 5 FEET AS MEASURED VERTICALLY FROM THE CREST OF THE EMBANKMENT TO THE DOWN SLOPE BASE OF THE EMBANKMENT OR TOW OF THE STONE DIKE, WHICHEVER IS LOWER.

SIDE SLOPES OF THE EMBANKMENT SHALL BE 2:1 OR FLATTER.

MODIFIED RIPRAP: SHALL MEET THE REQUIREMENTS OF THE RIDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SUBSECTION M.10.03.2.

FILTER STONE: SHALL MEET THE REQUIREMENTS OF THE RIDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SUBSECTION M.10.03.9 TABLE I, COLUMN V FILTER STONE.

Installation Requirements:

CLEAR, GRUB AND STRIP ANY VEGETATION AND ROOT MAT FROM ANY PROPOSED EMBANKMENT AND OUTLET AREA. REMOVE STONES AND ROCKS WHOSE DIAMETER IS GREATER THAN THREE (3) INCHES AND OTHER DEBRIS.

EXCAVATE WET STORAGE AND CONSTRUCT THE EMBANKMENT AND/OR OUTLET AS NEEDED TO ATTAIN THE NECESSARY STORAGE REQUIREMENTS. USE ONLY FILL MATERIAL FOR THE EMBANKMENT THAT IS FREE FROM EXCESSIVE ORGANICS, DEBRIS, LARGE ROCKS (OVER SIX (6) INCHES) OR OTHER UNSUITABLE MATERIALS. COMPACT THE EMBANKMENT IN 9-INCH LAYERS BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.

STABILIZE THE EARTHEN EMBANKMENT USING ANY OF THE FOLLOWING MEASURES, SEEDING FOR TEMPORARY VEGETATIVE COVER; SEEDING FOR PERMANENT VEGETATIVE COVER; OR SLOPE PROTECTION, IMMEDIATELY AFTER INSTALLATION.

CARRY OUT CONSTRUCTION OPERATIONS IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.

Inspection, Maintenance, and Removal Requirements:

INSPECT THE TEMPORARY SEDIMENT TRAP AT LEAST ONCE A WEEK AND WITHIN 24 HOURS OF THE END OF A STORM WITH A RAINFALL AMOUNT OF 0.25 INCH OR GREATER. CHECK THE OUTLET TO ENSURE THAT IT IS STRUCTURALLY SOUND AND HAS NOT BEEN DAMAGED BY EROSION OR CONSTRUCTION EQUIPMENT. THE HEIGHT OF THE STONE OUTLET OR WEIR CREST SHOULD BE MAINTAINED AT LEAST 1 FOOT BELOW THE CREST OF THE EMBANKMENT. ALSO CHECK FOR SEDIMENT ACCUMULATION AND FILTRATION PERFORMANCE.

WHEN SEDIMENTS HAVE ACCUMULATED TO ONE HALF THE MINIMUM REQUIRED VOLUME OF THE WET STORAGE, DEWATER THE TRAP AS NEEDED. REMOVE SEDIMENTS AND RESTORE THE TRAP TO ITS ORIGINAL DIMENSIONS. DISPOSE OF THE SEDIMENT REMOVED FROM THE BASIN IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE AND CAUSE SEDIMENTATION PROBLEMS.

THE TEMPORARY SEDIMENT TRAP MAY BE REMOVED AFTER THE CONTRIBUTING DRAINAGE AREA IS STABILIZED. IF IT IS TO BE REMOVED, THEN THE PLANS SHOULD SHOW HOW THE SITE OF THE TEMPORARY SEDIMENT TRAP IS TO BE GRADED AND STABILIZED AFTER REMOVAL.

Soil Erosion & Sediment Control Legend

- LOD — LIMIT OF DISTURBANCE
- SEC — SOIL EROSION CONTROL/ LIMIT OF DISTURBANCE
- TEMPORARY DRAINAGE SWALE
- TRIBUTARY AREA FOR TEMPORARY SEDIMENT TRAP
- TEMPORARY SEDIMENT TRAP

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OWNER INFO: *William M. Stamp Jr. Trustee*
ONE STAMP PLACE, EXETER, RI 02882

PREPARED BY: *Green Development, LLC*
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

No.	DATE	REVISION	BY
6	5/9/2019	TOWN RESUBMISSION	DSC
5	5/7/2019	RIDOT RESUBMISSION	RES
4	12/7/2018	RIDOT RESUBMISSION	RES
3	9/10/2018	TOWN PLANNER REVIEW COMMENTS	RES
2	8/7/2018	TOWN PLANNER REVIEW COMMENTS	RES
1	4/19/2018	DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION	RES

SHEET TITLE:
Soil Erosion and Sediment Control Plan

PROJECT INFORMATION:
GD Richmond Beaver River I
DIRECT CURRENT(DC)/ 7.45MW I ALTERNATING CURRENT(AC)/5.25MW
172 BEAVER RIVER ROAD, RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

KEVIN C. MORIN
No. 9851
REGISTERED PROFESSIONAL ENGINEER
CIVIL
9/9/2019

SHEET NO.:
C1.8 OF 11

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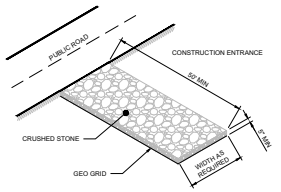
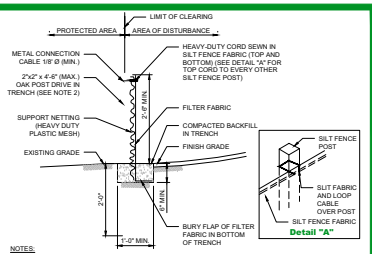


NOTES:

1. SHALL BE IN ACCORDANCE WITH SECTION 211 OF THE R.I. STANDARD SPECIFICATIONS
2. SHALL BE IN ACCORDANCE WITH RHODE ISLAND DEPARTMENT OF TRANSPORTATION R.I. STANDARD DETAIL 9.9.0.
3. SEE PLAN FOR LOCATION.

Construction Access

NOT TO SCALE



NOTES:

1. SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE R.I. STANDARD SPECIFICATIONS.
2. 2"x2" x 4'-6"(MAX.) OAK POSTS FOR SILT FENCE SHALL BE LOCATED 8'-0"(MAX.) o.c. IN WETLAND AREAS AND 4'-0"(MAX.) o.c. IN WETLAND RAVINE, GULLY OR DROP-OFF AREAS AS SHOWN ON PLANS.
3. 1"x 1" x 4'-6"(MIN.) POSTS PERMITTED FOR PRE-FABRICATED SILT FENCE.
4. SILT FENCE SHALL BE INSTALLED BEFORE ANY GRUBBING OR EARTH EXCAVATION TAKES PLACE.

Silt Fence Detail

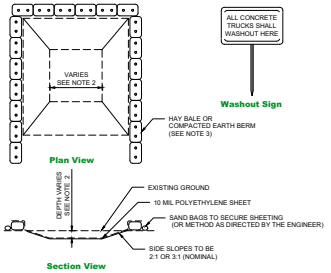
NOT TO SCALE

NOTES

1. CONCRETE WASHOUT AREA(S) SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE. THE CONCRETE WASHOUT AREA SHALL BE ENTIRELY SELF-CONTAINED.
2. THE CONTRACTOR SHALL SUBMIT THE DESIGN, LOCATION AND SIZING OF THE CONCRETE WASHOUT AREA(S) WITH THE PROJECT'S SOIL EROSION AND SEDIMENTATION CONTROL PLAN AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH ANY CONCRETE WORK.

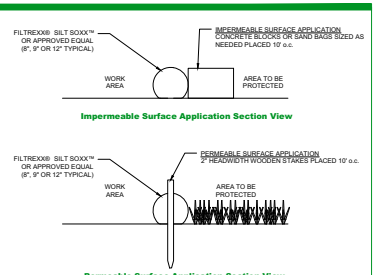
   LOCATION: WASHOUT AREA(S) ARE TO BE LOCATED AWAY FROM ANY STREAM, WETLAND, STORM DRAINS, OR OTHER SENSITIVE RESOURCE AREAS. WASH WATER SHALL NOT BE ALLOWED TO FLOW TO SURFACE WATER. THE FLOOD CONTINGENCY PLAN MUST ADDRESS THE CONCRETE WASHOUT IF THE WASHOUT IS TO BE LOCATED WITHIN THE FLOODPLAIN.

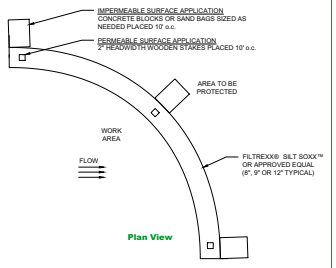
   SIZE: THE WASHOUT MUST HAVE SUFFICIENT VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS WITH A MINIMUM FREEBOARD OF 12".
3. SURFACE DISCHARGE IS UNACCEPTABLE, THEREFORE, HAY BALES OR OTHER CONTROL MEASURES, AS APPROVED BY THE ENGINEER, SHOULD BE USED AROUND THE PERIMETER OF THE CONCRETE WASHOUT AREA FOR CONTAINMENT.
4. SIGNS SHOULD BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CONCRETE AREA(S) AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS. WASHOUT AREA(S) SHOULD BE FLAGGED WITH SAFETY FENCING OR OTHER APPROVED METHODS.
5. WASHOUT AREA(S) ARE TO BE INSPECTED AT LEAST ONCE A WEEK FOR STRUCTURAL INTEGRITY, ADEQUATE HOLDING CAPACITY AND CHECKED FOR LEAKS, TEARS, OR OVERFLOWS. (AS REQUIRED BY THE CONTRACTION SITE ENVIRONMENTAL INSPECTION REPORT) WASHOUT AREA(S) SHOULD BE CHECKED AFTER HEAVY RAINS. WASHOUT AREA(S) SHALL NOT BE FILLED BEYOND 95% CAPACITY UNLESS A NEW WASHOUT AREA IS CONSTRUCTED.
6. HARDENED CONCRETE WASTE SHOULD BE REMOVED AND DISPOSED OF WHEN THE WASTE HAS ACCUMULATED TO HALF OF THE CONCRETE WASHOUTS HEIGHT. THE WASTE CAN BE STORED AT AN UPLAND LOCATION, AS APPROVED BY THE ENGINEER. ALL CONCRETE WASTE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH ALL APPLICABLE LAWS, REGULATIONS, AND GUIDELINES.



Concrete Washout Area

NOT TO SCALE





NOTES:

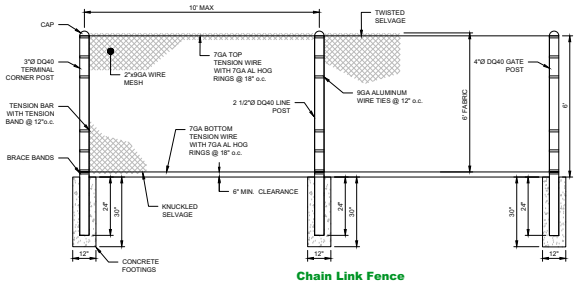
1. CONTRACTOR TO USE FILTREXX® SILT SOXX™ OR APPROVED EQUAL.
2. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
3. SILT SOXX™ FILL TO MEET APPLICATION REQUIREMENTS.
4. FILTER MEDIA TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.
5. SEE PLANS FOR LOCATION AND SURFACE APPLICATION TYPE.

Silt Soxx Sediment Barrier

NOT TO SCALE

Sequence of Construction

1. SURVEY AND STAKE LIMIT OF SEDIMENTATION BARRIERS/LIMIT DISTURBANCE.
2. INSTALL PERIMETER EROSION CONTROL BARRIERS AS SHOWN ON THE PLANS ALONG LIMIT OF DISTURBANCE. IN NO CASE IS THE LIMIT OF DISTURBANCE TO EXTEND BEYOND THE SEDIMENTATION BARRIERS.
3. CLEAR BRUSH AND TREES ON SITE IF NECESSARY, WITHIN LIMIT OF DISTURBANCE. IN NO CASE IS THE LIMIT OF DISTURBANCE TO EXTEND BEYOND THE SEDIMENTATION BARRIERS OR CONSTRUCTION FENCING.
4. PRIOR TO REMOVAL OF STUMPS AND SOIL DISTURBANCE, INSTALL TEMPORARY SEDIMENT SWALE AND TRAPS AS PER PLANS. ALL TEMPORARY CONTROL DEVICES SHALL BE INSTALLED PER THE RHODE ISLAND SOIL EROSION AND SEDIMENTATION CONTROL HANDBOOK.
5. GRUB AND REMOVE TREE STUMPS ON SITE IF NECESSARY. TOPSOIL IS TO BE STRIPPED AND STOCKPILED IN APPROVED LOCATIONS SHOWN ON PLANS TO BE RE-USED FOLLOWING TEMPORARY GRADING ACTIVITIES FOR SOIL EROSION MEASURES. STOCKPILES ARE TO BE PROTECTED BY A ROW OF SILT FENCE AND COVERED OR TEMPORARILY SEEDED.
6. RE-GRADE SITE AS NECESSARY PER PLANS.
7. INSTALL SOLAR PROJECT INCLUDING BUT NOT LIMITED TO THE INSTALLATION OF THE RACKING SYSTEM, UNDERGROUND CONDUIT, EQUIPMENT PADS, ACCESS PATH, PANELS, NEW UTILITY POLES ON SITE, FENCING, ETC. AS REQUIRED BY APPROVED PLANS.
8. ONCE ROUGH GRADE ON THE SITE HAS BEEN ESTABLISHED AND SOLAR PANELS/EQUIPMENT HAS BEEN INSTALLED, DISTURBED AREAS SHALL BE LOAMED AND SEEDED TO RE-ESTABLISH VEGETATION.
9. TEMPORARY SEDIMENT CONTROLS AND TRAPS ARE TO BE MAINTAINED AND REMAIN UNTIL THE SITE IS STABILIZED.
10. IN THE EVENT THE DRIP EDGE AT PANELS RESULTS IN RILL EROSION, INSTALL PROTECTIVE MEASURES SUCH AS CRUSHED STONE, EROSION CONTROLS BLANKETS, ETC. AS NEEDED.
11. REMOVE ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES FOLLOWING FINAL VEGETATIVE ESTABLISHMENT OF ALL DISTURBED AREAS AND FULL SITE STABILIZATION.
12. IMPLEMENT LONG TERM OPERATION AND MAINTENANCE PLAN.

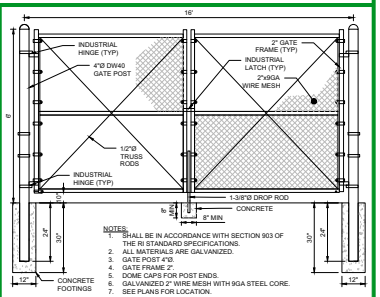


NOTES:

1. SHALL BE IN ACCORDANCE WITH SECTION 903 OF THE RI STANDARD SPECIFICATIONS.
2. ALL MATERIALS ARE GALVANIZED.
3. GATE POST 4"Ø.
4. TERMINAL POSTS 3"Ø.
5. GATE FRAME 2.5"Ø.
6. 7GA TOP AND BOTTOM TENSION WIRE TO MATCH FABRIC ATTACHED BY 7GA HOG RINGS WITH STEEL CORE.
7. TENSION BARS WITH TENSION BANDS @ 12" o.c.
8. DOME CAPS FOR POST ENDS.
9. 9GA TIE WIRES WITH STEEL CORE ON LINE POSTS.
10. 3" BRACE BANDS ON TERMINAL CORER POSTS.
11. GALVANIZED 2" WIRE MESH WITH 9GA STEEL CORE.
12. CONTRACTOR TO PROVIDE A 6" MINIMUM OF GROUND CLEARANCE BELOW FENCE TO ALLOW FOR SMALL WILDLIFE PASSAGE.
13. SEE PLANS FOR LOCATION.

Chain Link Fence

NOT TO SCALE

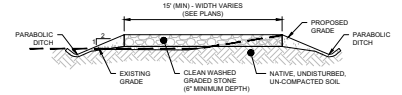


NOTES:

1. SHALL BE IN ACCORDANCE WITH SECTION 903 OF THE RI STANDARD SPECIFICATIONS.
2. ALL MATERIALS ARE GALVANIZED.
3. GATE POST 4"Ø.
4. GATE FRAME 2".
5. DOME CAPS FOR POST ENDS.
6. GALVANIZED 2" WIRE MESH WITH 9GA STEEL CORE.
7. SEE PLANS FOR LOCATION.

Chain Link Double Leaf Swing Gate

NOT TO SCALE



Surface Typical

Profile Typical

CONDITION:	DRIVEWAY THICKNESS	STONE SIZE	FINES
BASE LAYER WITH GEOTEXTILE FABRIC (NOT EXTENSIVELY WET)	6" MIN.	3 - 3½	0-6%
BASE LAYER WITH GEOTEXTILE FABRIC (WET CONDITIONS)	6" MIN.	3 - 3½	0-6%

CONSTRUCTION NOTES:

A. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER AS TO MINIMIZE POTENTIAL EROSION AND WATER QUALITY DEGRADATION.

B. FIXED EROSION CONTROLS AND SITE STABILIZATION SHALL BE CONDUCTED IN ACCORDANCE WITH APPROVED BMP'S, OR PURSUANT TO PROJECT SPECIFIC PERMITS.

C. TREES, STUMPS, ROOTS, BRUSH AND WEEDS SHALL BE REMOVED FROM THE WORK AREA IF DETERMINED NECESSARY TO SAFETY CONSTRUCT ROAD WAYS

D. ON WEAK BEARING SOIL SUCH AS LOOSE ALLUVIAL, OR WETLANDS SOILS, SURFACE TREATMENT SHOULD BE UNDERLAIN WITH WOVEN GEOTEXTILES.

E. AT MINIMUM, ROADSIDE DITCHES SHALL BE 1-FT BELOW ROAD SURFACE.

F. DISCHARGE POINTS FOR DITCHES SHALL NOT BE NEAR WETLANDS OF STREAMS, AND OR BE LOCATED AT THE DIRECTION OF THE EPSCS.

Surfacing Specifications

SIEVE DESIGNATION	PERCENTAGE BY MASS (WEIGHT) PASSING SQUARE MESH SIEVES
90 MM (3.5 INCH)	100
75 MM (3 INCH)	90-100
50 MM (2 INCH)	75-100
25 MM (1 INCH)	50-80
12.5 MM (1/2 INCH)	30-60
4.75 MM (NO.4)	15-40
75 UM (NO. 200)	0-6

DENSE GRADED CRUSHED STONE FOR SUBBASE:

A. DENSE GRADED CRUSHED STONE FOR SUBBASE SHALL CONSIST OF CLEAN, HARD, UNIFORMLY GRADED, CRUSHED STONE. IT SHALL BE SUFFICIENTLY FREE FROM DIRT, DELETERIOUS MATERIAL, AND PIECES THAT ARE STRUCTURALLY WEAK AND SHALL MEET THE FOLLOWING REQUIREMENTS:

B. SOURCE OF MATERIALS SHALL BE OBTAINED FROM AREAS STRIPPED AND CLEANED OF SOIL AND DEBRIS BEFORE BLASTING.

C. MATERIAL COARSER THEN THE THE 4.75 MM (NO.4) SIEVE SHALL NOT BE MORE THEN 30 PERCENT, BY MASS (WEIGHT), OF THIN AND/OR ELONGATED PIECES.

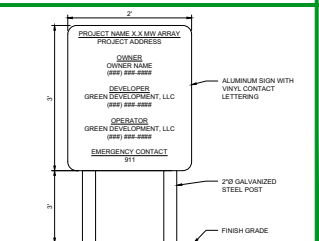
Material Specifications

SOURCES:

- SURFACING TYPICAL AND SURFACING SPECS. DERIVED FROM USDA NRCS DRAWING "ACCESS ROAD; ME-ENG-AR1"
- PROFILE TYPICAL: DERIVED FROM USDA FOREST SERVICE PUBLICATION "FOREST ROAD CONSTRUCTION AND MAINTENANCE"
- MATERIAL SPECS: DERIVED FROM VTRANS 704.06 SUBBASE

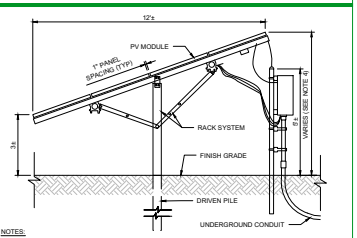
Permeable Access Driveway

NOT TO SCALE



Site Sign

NOT TO SCALE

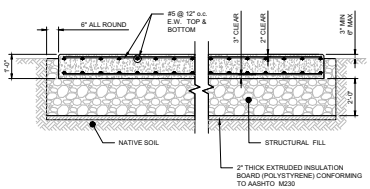


NOTES:

1. ADJACENT ARRAY TABLES SHALL BE INSTALLED WITH A MINIMUM OF 6 INCHES OF SEPARATION.
2. ROWS OF ARRAY TABLES SHALL BE INSTALLED WITH A MINIMUM OF 12 FEET OF SEPARATION.
3. TYPICAL SOLAR PANEL RACKING SYSTEM SHOWN. SELECTED RACKING SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' INSTRUCTIONS.
4. INSTALLED HEIGHT WILL VARY BASED ON THE RACKING LAYOUT AND FINAL DESIGN BUT WILL BE LESS THAN 12' PER ZONING CODE REQUIREMENTS.

Solar Panel Racking

NOT TO SCALE



Cast-In-Place Concrete Pad for Inverter

NOT TO SCALE

NOTES:

1. ALL CONCRETE WORK SHALL CONFORM TO ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE BUILDINGS".
2. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60 AND BE DETAILED IN ACCORDANCE WITH ACI 315 "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
3. REBAR SHALL HAVE A MINIMUM CONCRETE COVER AS FOLLOWS:
   - CONCRETE DEPOSITED AGAINST GROUND.....3 IN.
   - CONCRETE EXPOSED TO WEATHER OR CONTACT WITH GROUND: FOR BARS #5 AND LARGER.....2 IN. FOR BARS SMALLER THEN #5.....1 1/2 IN.
   - CONCRETE NOT EXPOSED TO THE WEATHER OR THE GROUND SLABS AND WALLS.....3/4 IN.
4. ALL REINFORCED BARS SHALL BE CONTINUOUS AND LAPPED A MINIMUM OF 48 BAR DIAMETERS AT ALL SPLICES, CORNERS AND INTERSECTIONS UNLESS NOTED OTHERWISE .
5. ALL REINFORCEMENT SHALL BE SECURELY TIED IN ITS PROPOSED LOCATIONS PRIOR TO AND DURING PLACEMENT OF CONCRETE USING APPROVED CHAIRS, SPACERS AND TIE WIRE AS REQUIRED. NO BARS SHALL BE CUT OR OMITTED IN THE FIELD WITH OUT THE APPROVAL OF THE ENGINEER.
6. CONCRETE PROTECTION FOR REINFORCEMENT SHALL IN ALL CASES BE AT LEAST EQUAL TO THE DIAMETER OF THE BAR EXCEPT FOR CONCRETE.
7. CONCRETE SHALL BE CAST-IN-PLACE, NORMAL WEIGHT CONCRETE AND SHALL DEVELOP A COMPRESSIVE STRENGTH OF 4,000 PSI IN 28 DAYS. CONCRETE SHALL HAVE A MAXIMUM AGGREGATE SIZE OF 3/4 INCH, MINIMUM CEMENT CONTENT OF 560 LBS/CU. YD., AND A MAXIMUM SLUMP OF 4 INCHES.
8. ALL EXPOSED EDGES OF CONCRETE SHALL HAVE A 3/4 INCH CHAMFER UNLESS NOTED.
9. ALL CONCRETE EXPOSED TO THE WEATHER SHALL BE AIR- ENTRAINED.
10. SIZES AND LOCATIONS OF ALL REQUIRED EMBEDDED ITEMS FOR ALL TRADES SUCH AS ANCHOR BOLTS, PIPING SLEEVES HOLD DOWN ANCHORS, ETC., SHALL BE COORDINATED BY THE CONTRACTOR WITH OTHER TRADES.

W:\Wind Drive Org Template\2. Sites\Richmond\Stamp_Beaver_River\3. Development\2. Engineering\DWG\Stamp_Beaver_River--Design.dwg May 09, 2019 - 12:27pm

3760 Quaker Lane
North Kingstown, RI 02852
(401) 295-4998
www.green-ri.com

GREEN development, LLC

APPLICANT INFO: *GD Richmond Beaver River I, LLC*
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

OWNER INFO: *William M. Stamp Jr. Trustee*
ONE STAMP PLACE, EXETER, RI 02882

PREPARED BY: *Green Development, LLC*
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

No.	DATE	REVISION	BY
6	5/9/2019	TOWN RESUBMISSION	RES
5	5/7/2019	RIDOT RESUBMISSION	RES
4	12/7/2018	RIDOT RESUBMISSION	RES
3	9/11/2018	TOWN PLANNER REVIEW COMMENTS	RES
2	5/7/2018	TOWN PLANNER REVIEW COMMENTS	RES
1	4/19/2018	DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION	RES

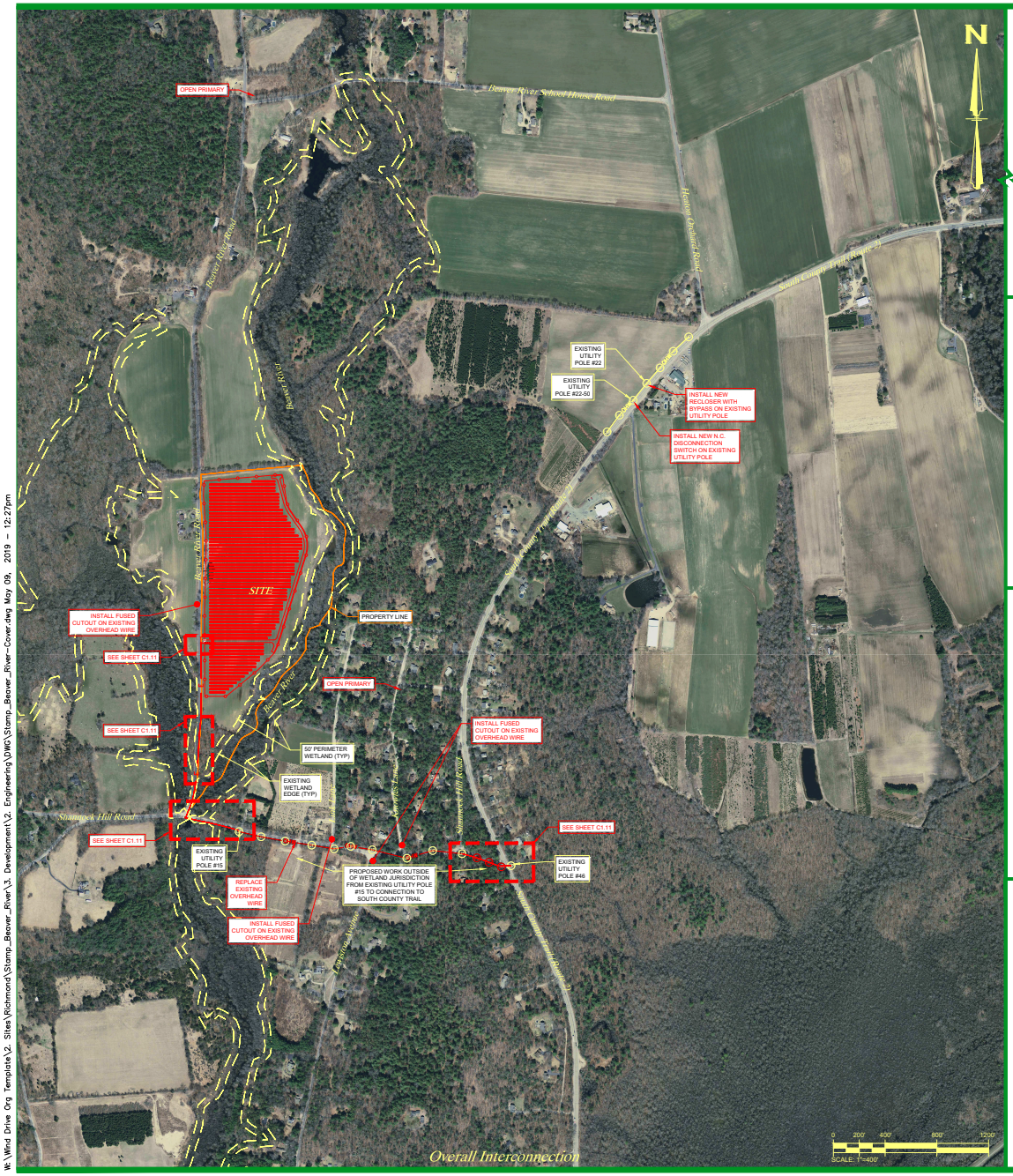
SHEET TITLE: *Detail Sheet*

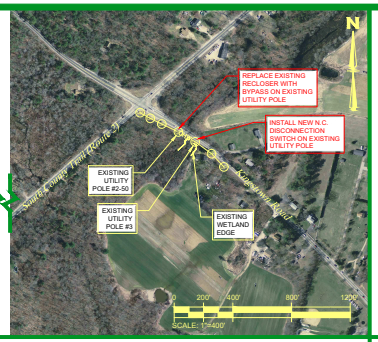
PROJECT INFORMATION: *GD Richmond Beaver River I*

DIRECT CURRENT(DC): 7.45MW | ALTERNATING CURRENT(AC): 5.25MW
172 BEAVER RIVER ROAD, RICHMOND, RI 02812
ASSESSOR'S PLAT: 8E LOT 12

KEVIN C. MORIN
No. 19951
REGISTERED PROFESSIONAL ENGINEER
CIVIL
5/9/2019

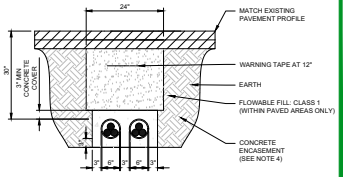
SHEET NO.:
C1.9 OF 11





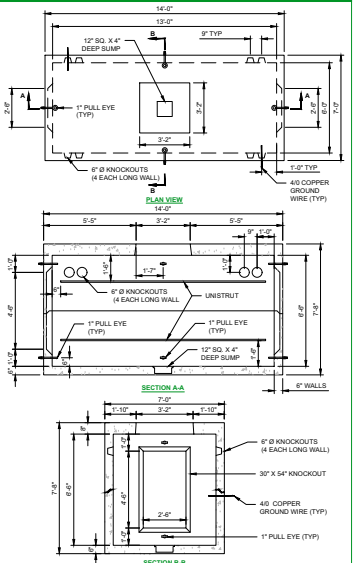
NOTES:

1. ALL CONDUIT IS 6" EB-35
2. CONDUIT TO BE INSTALLED IN SPACERS AT 3" BASE AND 3" INTERMEDIATE.
3. PRIMARY SETS ARE 35KV 3-1/C 1000LCMIL, STRANDED COPPER, EPR, CONCENTRIC ⅓ NEUTRAL
4. CONCRETE MIX PER NATIONAL GRID STANDARD
5. CONCRETE TO BE EARTH FORMED.
6. FLOWABLE FILL TO BE USED FOR ALL BACKFILL TO SUBGRADE.
7. WARNING TAPE TO BE BLACK PRINTING ON RED BACKGROUND.



Ductbank Cross Section

(NOT TO SCALE)

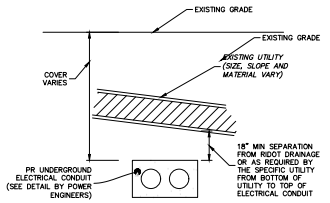


NOTES:

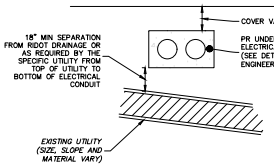
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGN LOADING: AASHTO HS20-44, 0 TO 5 FEET COVER.
3. DESIGN SPECIFICATIONS - ACI 318 & AASHTO LOAD FACTOR DESIGN METHOD.
4. STEEL REINFORCEMENT CONFORMS TO ASTM A615, GRADE 60. MINIMUM COVER 1"
5. ALL TERMINATORS SHALL HAVE BELL ENDS FLUSH WITH THE INSIDE WALL.
6. CONSTRUCTION JOINT SHALL BE SEALED WITH 1"Ø BUTYL RUBBER OR APPROVED EQUAL.

Electrical Manhole

(NOT TO SCALE)



CONDUIT CROSSING BELOW EXISTING UTILITY



CONDUIT CROSSING OVER EXISTING UTILITY

Typical Electrical Conduit Utility Crossing

(NOT TO SCALE)

GREEN development, LLC
3760 Quaker Lane
North Kingstown, RI 02852
(401) 295-4998
www.green-ri.com

APPLICANT INFO: *GD Richmond Beaver River I, LLC*
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

OWNER INFO: *William M. Stamp Jr. Trustee*
ONE STAMP PLACE, EXETER, RI 02882

PREPARED BY: *Green Development, LLC*
3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

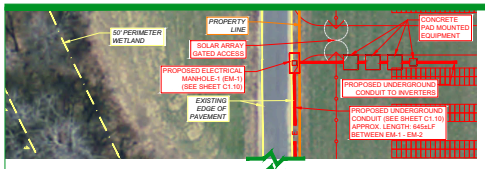
No.	DATE	REVISION	BY
6	5/9/2019	TOWN RESUBMISSION	KMC
5	5/7/2019	RIDOT RESUBMISSION	RBS
4	12/7/2018	RIDOT RESUBMISSION	RBS
3	5/11/2018	TOWN PLANNER REVIEW COMMENTS	RBS
2	5/7/2018	TOWN PLANNER REVIEW COMMENTS	RBS
1	4/19/2018	DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION	RBS

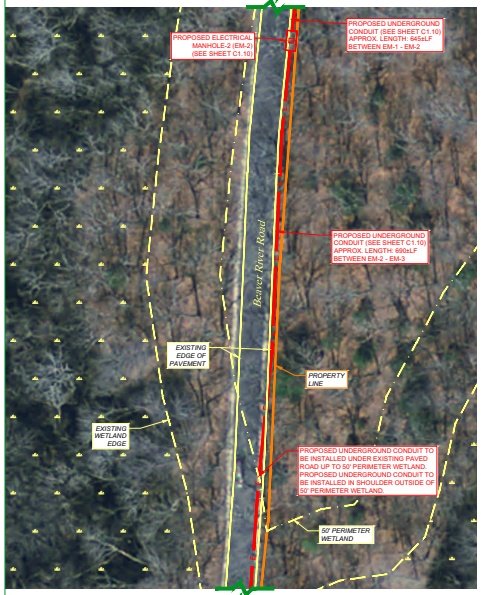
SHEET TITLE:
Interconnection - Overall & Details

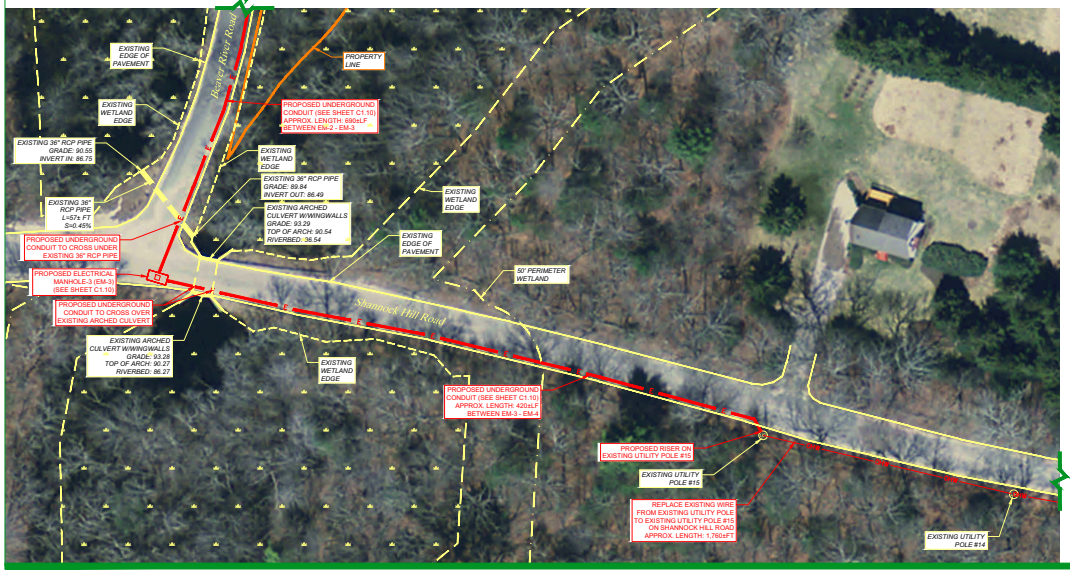
PROJECT INFORMATION:
GD Richmond Beaver River I
DIRECT CURRENT(DC): 7.45MW | ALTERNATING CURRENT(AC): 5.25MW
172 BEAVER RIVER ROAD, RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

KEVIN C. MORIN
No. 18851
REGISTERED PROFESSIONAL ENGINEER
CIVIL
5/9/2019

SHEET NO.:
C1.10 OF 11







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3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

No.	DATE	REVISION	BY
6	5/9/2019	TOWN RESUBMISSION	DBC
5	5/7/2019	RIDEM RESUBMISSION	RES
4	12/7/2018	RIDEM RESUBMISSION	RES
3	9/10/2018	TOWN PLANNER REVIEW COMMENTS	RES
2	8/7/2018	TOWN PLANNER REVIEW COMMENTS	RES
1	4/24/2018	DEVELOPMENT PLAN REVIEW & SPECIAL USE PERMIT SUBMISSION	RES

SHEET TITLE:
Interconnection - Enlarged

PROJECT INFORMATION:
GD Richmond Beaver River I
DIRECT CURRENT(DC)-7.45MW | ALTERNATING CURRENT(AC)-5.25MW
172 BEAVER RIVER ROAD, RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

KEVIN C. MORIN
No. 9851
REGISTERED PROFESSIONAL ENGINEER
CIVIL
5/9/2019

SHEET NO.:
C1.11 OF 11

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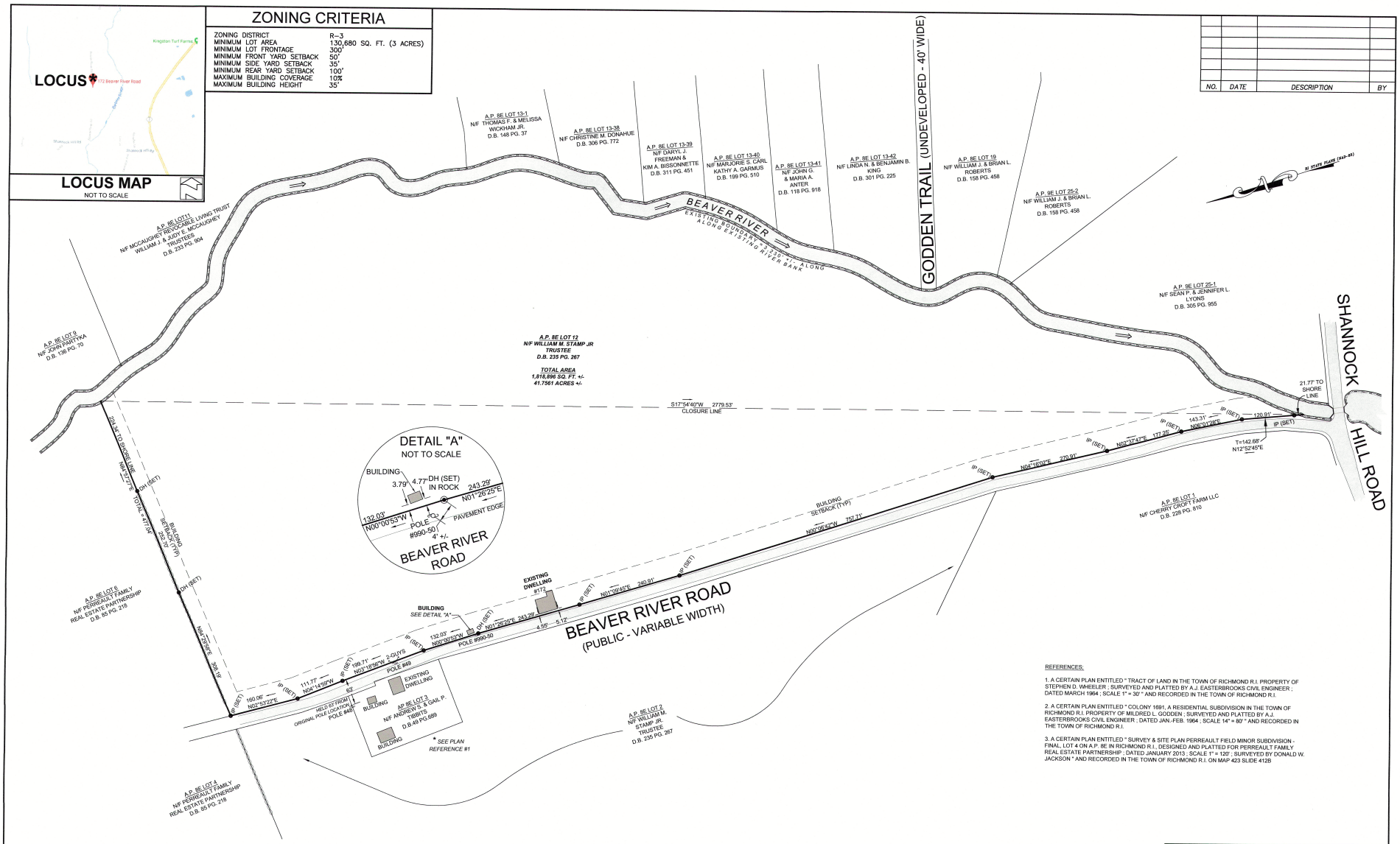

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CROSSMAN ENGINEERING

Consulting Engineers & Surveyors
Civil • Transportation • Environmental • Site Planning • Surveying • Permitting

DECOMMISSIONING PLAN REVIEW MEMORANDUM

To: Shaun Lacey, AICP
Town Planner

From: Steven Cabral
Crossman Engineering

Date: May 21, 2019

Re: GD Richmond Beaver River I, LLC (172 Beaver River Road)

Crossman Engineering has been retained to perform an independent review of the Decommissioning Plan and Costs for the GD Richmond Beaver River I, 5.3 megawatt (AC) ground mounted solar project proposed at 172 Beaver River Road. Our review was based on the following documents:

- Green Development, LLC Photovoltaic End of Life Decommissioning Plan, April 2018
- Development Plan Review and Special Permit Submission Plan Set, by Green Development

Upon review of the decommissioning data, we prepared the following summary of comments:

Decommissioning Cost Estimate:

1. The basis for the cost estimate is stated to be pro-rated from the approved bond estimate provided to the Town of Richmond for the Bucknam Road solar project in 2017. We recommend that an independent justification of quantities and unit costs be provided. No data on the Bucknam project was provided.
2. The costs do not appear to account for inflation adjustments over the life of the project. The inflation value needs to be identified and based upon long term historical data. A minimum value of 2.5% (annual, compounded) rate is recommended.
3. The costs for engineering oversight, permits and inspections during decommissioning should be added to the estimate.
4. The cost for maintaining and operating the stormwater system will need to be included until the site is fully vegetated to pre-development conditions and the stormwater systems are no longer needed.
5. For re-seeding disturbed areas, only labor costs are stated. The material quantity and unit cost should be provided for review.

6. Item 3.4 identifies the proposed use of cranes and trucks to remove the system components. Due to the resulting soil compaction, the reseeding costs should include the cost of scarifying the soils in advance of seeding and the need for watering.
7. Item 3.5 identifies soil erosion control measures which will need to be implemented, but the associated costs were not identified in the estimate.
8. The costs should also include removal of utility access roads throughout the site.

The salvage value of components and labor/material costs will vary during the 20 – 30 year life of the project. If the Town Ordinance allows, it is recommended that at 10 year intervals, the decommissioning cost be re-evaluated to ensure that future costs are adequately covered.

We also recommend that the Decommissioning Plan also specifically address the following items:

1. Section 2 states that decommissioning activities will occur within 12 months of the defined end of life (EOL) but it was not readily apparent what defines the project's EOL. Clarification of the solar developer's definition of EOL is recommended. For example, the anticipated life of the project is stated to be 35 years but the PPA appears to have a 20 – 25 year duration. EOL is a factor in assessing the future cost of decommissioning.
2. The allowed duration of the decommissioning activities should be stated in the Decommissioning Plan.

Operation and Maintenance Program

Operation and Maintenance to be performed by Green Development, LLC

1. Customer Service and System Support

Green Development, LLC (GREEN) is the parent company that develops, owns and operates electric generation facilities for municipalities and other state entities. The company offers a complete solution for the ownership and maintenance of the solar energy systems over the full length of the project's life (25+ years). GD Richmond Beaver River I, LC is an entity created specifically for this project. Included in our scope for projects which we own and operate are the following services:

- Performing routine maintenance
- Inspecting the system
- Responding to outages
- Repairing the system in the event of failure

2. System Ownership and Support

The project will be owned and operated by GREEN (or affiliated entity) or sold to a municipal or public entity who will contract with GREEN for asset management. As of early 2018 GREEN has developed 18MW of wind turbines and 13MW of solar projects in the state of Rhode Island, of which all are either owned and operated by GREEN or under contract for asset management with GREEN. Our experience in owning and operating these assets, combined with our local presence provides peace of mind to local municipalities and power purchasers. GREEN employs the skills of engineers, construction and project managers, environmental specialists, and skilled technicians in developing, constructing, commissioning, operating and decommissioning a project. With the experience, commitment and financial standing of GREEN, our customers can be confident that we will be present throughout the 25-year contract to provide support and assistance for the project.

GREEN will monitor the project's performance and assume responsibilities of managing the asset, including:

a. System Commissioning and Inspection
b. Daily Performance Monitoring
c. Preventive Maintenance
d. Outage Response, Corrective Maintenance and Incident Tracking
e. Warranty Administration
f. Insurance Claim Management
g. Track Performance Guarantees to ensure compliance
h. Regulatory Reporting (FERC, NERC, DOE, ISO)

3. Monitoring and Customer Response

GREEN will monitor the project on a real-time basis and run regular analysis of the system output to ensure it is meeting performance expectations. The company will utilize monitoring software that provides automated analysis and alerting across a wide range of environmental and operating parameters, and take all appropriate actions as necessary. The monitoring system allows for GREEN to:

a. Quickly detect system failures and performance degradation
b. Remote troubleshoot and qualify problems

c. Prompt dispatch of service response crews
d. Analyze long term system performance
e. Complete collection of yield and system performance data

4. Preventative Maintenance (Equipment/Electrical)

A site-specific schedule of preventive maintenance activities will be created and managed by GREEN to ensure the continued and reliable performance of the project. All of this work will be performed in accordance with manufactures recommendations. An example of a typical preventive maintenance plan includes the following items.

a. DC Operating Current Testing
b. Open Circuit Voltage Testing
c. Check for Damage or Defects in Modules
d. Visual Inspection of Array Mechanical Components
e. Visual Inspection of AC and DC Electrical Components
f. Inverter Inspection and Check Torque on Electrical Terminations
g. Inverter Filter Cleaning/Replacement
h. Inverter Pad/Container – Inspection and Cleaning
i. Check Torque on System Mechanical Connections
j. Routine Monitoring System Maintenance, Data Integrity Check
k. Routine Electrical and Ground Connections System Maintenance
l. Inspect Combiner Boxes, Tighten Connections
m. Inverter Functional Testing
n. Corrosion Protection
o. Use of "Decibel Tester" twice a year for noise generated by inverters

The above-mentioned tasks will be performed in accordance with best practices for what is necessary, given the site-specific environment of the solar project, as well as all requirements of the manufacturers. As the owner of the system, GREEN has every incentive to keep the system functioning at its peak performance. Any loss of performance due to system downtime is a direct cost to GREEN. GREEN will be singularly focused on operating the array at its maximum potential throughout the life of the PPA (or other type of agreement).

The product data sheets have been included in addendum #1 for the inverter, panel, and racking system (or equivalent). Due to the size of the installation and operation manuals, links to the locations have been provided for each product below. Hard copies can be provided upon request.

5. Landscaping and Site Maintenance

The following items address long term operation and maintenance for the overall site with specific attention to landscaping and site wide long-term operation and maintenance. A site-specific schedule of preventive maintenance activities will be created and managed by GREEN to ensure the continued and reliable performance of the project. The following landscape and site maintenance parameters are highlighted:

a. Site Soil Erosion, Sediment Control, and Stormwater inspections (see Operation and Maintenance Plan GD Richmond Beaver River I, prepared by Green Development, LLC dated April, 2018)
b. Landscape maintenance – the proposal for this project is the area between and below the solar panels not utilized for driveway access will be loamed and seeded with a drought-tolerant, shade

tolerant low growth grass seed mix to comply with NFPA requirements in A11.12.3.2 as amended February 6, 2018. The growth will be maintained to prevent the establishment of woody growth, tall weeds, etc. so as not to interfere with the operation of the solar panels. The site will also be maintained to reduce the risk of ignition from growth or other ignition sources from the electrical system. The row spacing and clearances proposed allow for access by mowing equipment and hand-held trimmers for periodic maintenance.

Product Manuals (or equivalent)

Yaskawa-Solectria Solar – SGI 500/750 XTM Inverter:
https://solectria.com//site/assets/files/1667/docr-070506-d_manual_installation_and_operation_sgi_500xtm-750xtm-1.pdf

JA Solar – JAM7201

RBI Solar – Ground Mount Solar Racking
http://www.rbisolar.com/assets/docs/RBI_Solar_Specification.pdf

Addendum #1

(Note: Final equipment selections may vary as the result of competitive bidding with equivalent equipment for other vendors)

YASKAWA
SOLECTRIA SOLAR

MW SMARTGRID STATIONS

MSS 0.5MW-XTM
MSS 0.75MW-XTM
MSS 1MW-XTM
MSS 1.5MW-XTM

FEATURES

- 0.5 to 1.5MW fully-integrated stations
- Direct connection to MV utility power
- Quick & easy installation
- 1000 VDC

OPTIONS

- Open skid, canopy or enclosure
- Peer or pad mount
- Radial or loop feed
- Dust filters
- DC breakers/subcombiners (for inverters)
- Auxiliary power
- Extended warranty
- Uptime guarantee

OPTIONS FOR UTILITIES

- Real power curtailment
- Reactive power control
- Voltage ride through
- Frequency ride through
- Controlled ramp rates
- SCADA/DMS tie-in

SOLECTRIA.COM

MEDIUM VOLTAGE SMARTGRID STATIONS

The Megawatt Solar Stations (MSS) provide a fully-integrated inverter solution for large ground-mount PV systems. The MSS is available in three styles - open skid, canopy, or enclosed building. The station combines one or two Yaskawa - Solectria Solar SGI 500XTM or SGI 750XTM inverters, communications equipment, 2.5-35 kV medium voltage transformer for multi-megawatt projects. All components arrive at a customer site fully assembled and tested, saving the additional time and cost of installing and wiring separate components.

INTERTEK ETL LISTED C US

SPECIFICATIONS	MSS 0.5MW-XTM	MSS 0.75MW-XTM	MSS 1MW-XTM	MSS 1.5MW-XTM
Structural				
Dimensions (L x W x D) Skid Canopy Enclosure	267 x 138 x 95 in. (6782 x 3506 x 2413 mm) 267 x 138 x 129 in. (6782 x 3506 x 3277 mm) 410 x 138 x 120 in. (10414 x 3506 x 3048 mm)			
Weight Skid Canopy Enclosure	35,000 lbs (15,876 kg) 36,500 lbs (16,556 kg) 37,000 lbs (16,783 kg)	37,500 lbs (17,010 kg) 39,500 lbs (17,917 kg) 39,500 lbs (17,917 kg)	40,000 lbs (18,144 kg) 41,500 lbs (18,824 kg) 42,000 lbs (19,051 kg)	45,000 lbs (20,412 kg) 46,500 lbs (21,092 kg) 47,000 lbs (21,319 kg)
Color	Frisco White; other colors optional			
Baseframe	Structural steel; conforms to ASTM A36; shop welded			
Enclosure Type	Skid, Canopy, or Enclosure			
Flooring (Enclosure)	1/4"steel plate or 3/16"diamond tread steel plate; insulation optional			
Walls (Enclosure)	Post minimum 14 gauge galvanized, shop welded to structural steel base frame & roof z-bracket			
Siding (Enclosure)	Full length, tight fitted, weather tight & weather proof; standard 0.040 gauge factory painted stucco aluminum			
Roof (Enclosure)	Full length, tight fitted, weather tight & weather proof; EPDM membrane roof optional; bows are c-style 16 gauge galvanized at 24"; sloped at 1"minimum pitch; insulation optional			
Door (Enclosure)	Minimum 20 gauge hollow metal doors with R2.4 insulation; interior panic hardware; door closer; exterior drip strips			
Electrical				
Lighting (Enclosure)	Interior florescent lighting; 4 ft or 8 ft T8 high output light fixtures; other light fixtures available			
Conduit & Fittings	Electrical metallic tubing (EMT) or flexible metal conduit; not less than 1/2" diameter			
Light Switches (Enclosure)	20 A, 250 V minimum (located at doors)			
Convenience Power	120 V, 20 A receptacles, listed GFCI weather tight & approved for outdoor use			
Wireways & Cables	All MSS components are listed and station is in full compliance with the National Electric Code (NEC)			
Medium Voltage Transformer*				
Nominal Output Power	500 kVA, 3-Ph	750 kVA, 3-Ph	1000 kVA, 3-Ph	1500 kVA, 3-Ph
Utility Connection Voltage	2.5-35 kV			
Utility Connection kV Classes	15 kV / 25 kV / 35 kV			
Taps	(2) 2.5% above & (2) below nominal			
Frequency	60 Hz			
Inverter Output Voltage	380 VAC			
Inverter Output kV Class	1.2 kV			
Cooling Class	KNAN			
Insulating Fluid	Envirotemp FR3			
Overcurrent Protection	Partial range current-limiting fuses			
Confi uration	Dead front and loop feed			

* Transformer options not listed, but may be quoted upon request

YASKAWA
SOLECTRIA SOLAR

UTILITY-SCALE INVERTERS

SGI 500XTM
SGI 750XTM

FEATURES

- Compliant with NEC 2014 690.11 & 690.12 arc-fault and rapid shutdown requirements when coupled with ARCCOM combiner
- 98% CEC efficiency
- 1000 VDC
- Parallel power stages
- Fuse and breaker subcombiner options
- Modbus communications
- User-interactive LCD

OPTIONS

- Stainless steel enclosure
- Web-based monitoring
- Built-in cellular connectivity
- AC breaker with shunt trip
- Revenue grade metering
- Airfi
- Uptime guarantee

OPTIONS FOR UTILITIES

- Real power curtailment
- Reactive power control
- Voltage ride through
- Frequency ride through
- Controlled ramp rates
- DMS tie-in
- Rule 21 compliant

SOLECTRIA.COM

1000VDC UTILITY-SCALE INVERTERS

The only 1000VDC inverter available that is compliant with NEC 2014 690.11 & 690.12 arc-fault and rapid shutdown requirements. Yaskawa - Solectria Solar's SMARTGRID series inverters are optimized for high efficiency, reliability, and economy. Available in two power classes, 500 kW and 750 kW, these inverters are designed for direct connection to an external transformer for large commercial or utility-scale applications. They are robust, outdoor rated inverters that can be configured as 1 or 1.5 MW Solar Stations. Available utility-scale options include advanced grid management features such as voltage and frequency ride through, reactive power control, real power curtailment and power factor control. Listed to 1000 VDC with 98% CEC weighted efficiency, the SGI 500/750XTM inverters set a new standard for large scale power conversion.

INTERTEK ETL LISTED C US

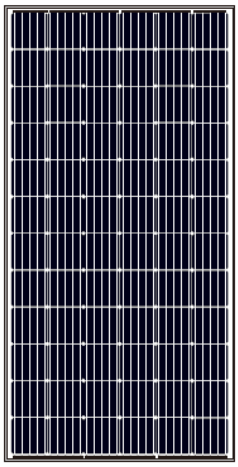
SPECIFICATIONS	SGI 500XTM	SGI 750XTM
DC Input		
Absolute Maximum Input Voltage	1000 VDC	
Max Power Input Voltage Range (MPPT)*	545–820 VDC	
Operating Voltage Range	545–1000 VDC	
Maximum Operating Input Current	965 A	1445 A
Maximum PV Power	700 kW	1050 kW
Strike Voltage	700 V	
AC Output		
Native Output Voltage	380 VAC, 3-Ph	
AC Voltage Range	-12/+10%	
Continuous Output Power	500 kW	750 kW
Continuous Output Current	760 A	1140 A
Maximum Backfeed Current	0 A	
Nominal Output Frequency	60 Hz	
Output Frequency Range	57–60.5 Hz	
Power Factor	Adjustable – 0.8 to +0.8, factory set at 1	
Fault Current Contribution (1 Cycle RMS)	912 A	1368 A
Total Harmonic Distortion (THD) @ Rated Load	< 3%	
Efficiency		
Peak Efficiency	98.3%	
CEC Efficiency	98.0%	
Tare Loss	89 W	123 W
Subcombiner Options		
Fuses	4 to 16 positions, 100–400 A	
Breakers	4 to 15 positions, 125–350 A	
Temperature		
Ambient Temperature Range (full power)	-40°F to +122°F (-40°C to +50°C)	
Storage Temperature Range	-40°F to +122°F (-40°C to +50°C)	
Relative Humidity (non-condensing)	5–95%	
Data Monitoring		
Optional SolrenView Web-based Monitoring	Integrated	
Optional Revenue Grade Monitoring	800 A	1600 A
Optional SolZone™ Sub-Array Monitoring (DC Current)	1 zone per protected input (up to 16 zones)	
Optional Cellular Communication	SolrenView AIR	
External Communication Interface	RS-485 SunSpec Modbus RTU	
Testing & Certifications		
Safety Listings & Certifications	UL 1741/IEEE 1547, CSA C22.2#107.1	
Testing Agency	ETL	
Warranty		
Standard	5 year	
Optional	10, 15, 20 year; extended service agreement; uptime guarantee	
Dedicated External Transformer		
Dedicated External Transformer	Required, provided by customer to Solectria's specification	
Transformer Type	Self cooled, step up, pad mount	
Output Voltage	Typical: 2.4–36.0 kV, 3-Ph	
Enclosure		
dBA (Decibel) Rating	< 67 dBA @ 10 m	
DC Disconnect (integrated)	Standard	
AC Disconnect/Breaker (integrated)	Optional disconnect, breaker or breaker with shunt trip	
Dimensions (H x W x D)	82 in. x 109 in. x 41 in. (2083 mm x 2769 mm x 1042 mm)	
Shading Set Back	137" (3480 mm) at 30° solar elevation	
Shipping Weight	3080 lbs (1398 kg)	3570 lbs (1620 kg)
Enclosure Rating	Type 3R	
Enclosure Finish	Polyester powder coated steel; optional 316 stainless steel	

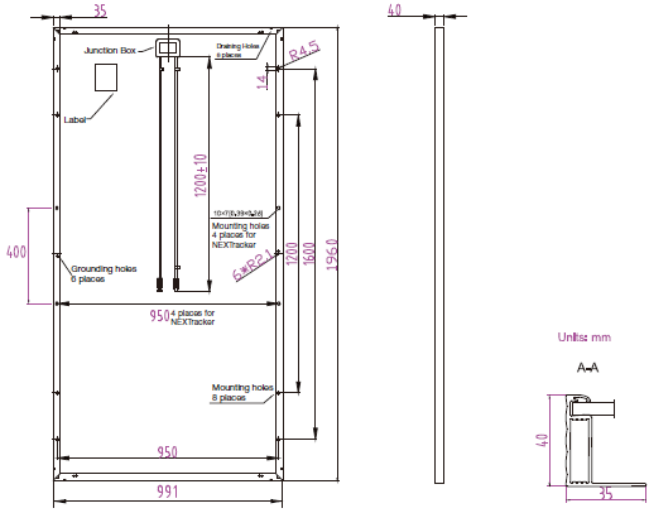
*At nominal AC voltage

JA SOLAR

JAM72S01 340-360/PR
1500V Percium Series

MECHANICAL DIAGRAMS





■ customized cable length available upon request

SPECIFICATIONS

Cell	Mono 156.75x156.75mm
Weight	22.5kg±3%
Dimensions	1960×991×40mm
Cable Cross Section Size	4mm²(12AWG)
No. of cells	72 (6×12)
Junction Box	IP67, 3 diodes
Connector	Amphenol UTX
Packaging Configuration	27 Per Pallet

OPERATING CONDITIONS

Maximum System Voltage	1500V DC (UL)
Operating Temperature	-40℃~+85℃
Maximum Series Fuse	20A
Maximum Static Load, Front* Maximum Static Load, Back*	5400Pa(112 lb/ft²) 2400Pa(50 lb/ft²)
NOCT	45±2℃
Fire Performance	Type 1
Application Class	Class A

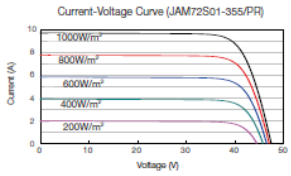
ELECTRICAL PARAMETERS AT STC

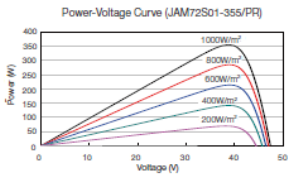
TYPE	JAM72S01 -340/PR	JAM72S01 -345/PR	JAM72S01 -350/PR	JAM72S01 -355/PR	JAM72S01 -360/PR
Rated Maximum Power (Pmax) [W]	340	345	350	355	360
Open Circuit Voltage (Voc) [V]	46.86	47.05	47.24	47.45	47.66
Maximum Power Voltage (Vmp) [V]	38.18	38.39	38.58	38.76	38.96
Short Circuit Current (Isc) [A]	9.46	9.54	9.61	9.69	9.78
Maximum Power Current (Imp) [A]	8.91	8.99	9.07	9.16	9.24
Module Efficiency [%]	17.50	17.76	18.02	18.28	18.53
Power Tolerance	-0~+5W				
Temperature Coefficient of Isc (α_Isc)	+0.060%/℃				
Temperature Coefficient of Voc (β_Voc)	-0.300%/℃				
Temperature Coefficient of Pmax (γ_Pmp)	-0.390%/℃				
STC	Irradiance 1000W/m², cell temperature 25℃, AM 1.5G				

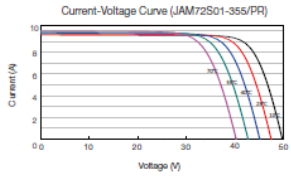
ELECTRICAL PARAMETERS AT NOCT

TYPE	JAM72S01 -340/PR	JAM72S01 -345/PR	JAM72S01 -350/PR	JAM72S01 -355/PR	JAM72S01 -360/PR
Max Power (Pmax) [W]	250	254	257	261	265
Open Circuit Voltage (Voc) [V]	43.28	43.52	43.68	43.88	44.10
Max Power Voltage (Vmp) [V]	35.25	35.51	35.78	35.81	36.03
Short Circuit Current (Isc) [A]	7.48	7.54	7.61	7.68	7.74
Max Power Current (Imp) [A]	7.09	7.14	7.19	7.29	7.34
NOCT	Irradiance 800W/m², ambient temperature 20℃, wind speed 1 m/s, AM 1.5G				

CHARACTERISTICS







Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.
*For NexTracker installations static loading performances: front load measures 2400Pa while back load measures 1600Pa.

RBI SOLAR

Solar Mounting Systems

GROUND MOUNT

DESIGN • ENGINEERING • MANUFACTURING • INSTALLATION

www.rbisolar.com

RBI Solar designs, engineers, manufactures and installs solar mounting systems. This single-source responsibility is focused on delivering value throughout the solar value chain.

Features & Benefits

- **Custom engineered to specific site conditions**
- **High strength steel with corrosion protection**
- **Designed to minimize field installation labor**
  - Reduced number of posts compared to traditional racking
  - Follows contours to mitigate civil/site work
  - Same hardware throughout
  - Optional pre-assembly
- **Design and engineering at every step of the way**
  - In-house engineers
  - Stamped drawings including foundation
- **Pile driving test available**
- **Flexible to mount any module type**
- **Nationwide installation**
- **Various foundation options**
- **UL 2703 classification available**
- **Procurement and manufacturing:**
  - Leverage with national and international facilities
  - Material certification available
  - ARRA compliant; "Made in the USA" certification available

RBI Solar Background

Family owned and operated, we pride ourselves in 80+ years of experience in commercial design-build specialty structures. RBI Solar's unique design capabilities and multiple manufacturing facilities help us develop the most economical, reliable and robust solutions for any structural solar mounting challenge. We are committed to taking single point responsibility for the entire project starting from the initial design to complete installation of solar modules.

Engineered Foundation Options

Our engineers consider many factors when determining the most reliable and cost-effective foundation solution for our projects. Incorporating and analyzing data from available certified geotechnical reports, on-site pile testing, wind tunnel testing, and all applicable codes and loading considerations, our team can provide various foundation options:

- Driven post
- Concrete pier
- Dual post
- Screw piles
- Pre-cast or cast-in-place concrete ballast
- Spread footings

Installation Services

With experience of completing multiple solar racking jobs for commercial, institutional and utility customers, RBI Solar is the most trusted name when it comes to solar racking installation. Our highly trained project managers and installation crews work with your on-site engineers to install custom engineered solar racking systems. Racking installation is essential for meeting project time and budget goals. Advantages of using RBI Solar for installation include:

- Company owned post driving equipment
- Highly skilled construction crews that specialize in solar racking
- Dedicated project managers

Technical Specifications

Description of product	Fixed tilt racking
Efficient designs	GM-I, GM-T and GM-B
Module configuration	Londscor.e or portrait ; designed to occomoaote any module type
Tilt angle	0° to 45°
Array height	Project specific design
Ground cover ratio	Project specific design
Installation options	Posts, racking and module mounting
Geographical range	Nationwide
Grounding	Continuously banded rocking; tested by ETL to UL2703 standards (GIV\-1 & GM-T)
Wire management	Built-in wire management options
Design criteria	Engineered to meet applicable structural codes
Warranty	20-yeor limited warranty

Contact Us 5513 /11 18 '.:Jt, eet (111u1111c1tr UH 45217 www r b1solar.corn 513 L42 2C) I info\Z r b1solar.corn

SINGLE SOURCE PROVIDER

DESIGN

System classified to UL 2703, with in-house designers and engineers. Our focus is to deliver the most effective and efficient racking solution based upon the array layout and site conditions.

ENGINEERING

Our in-house engineers, licensed and registered in all states, provide structural calculations applying RBI proprietary wind tunnel analysis and focus on delivering appropriate racking and foundation design based on existing soil conditions.

MANUFACTURING

Multiple state-of-the-art manufacturing facilities, along with a vertically integrated procurement and manufacturing protocol, ensures overall quality of product with reduced lead times for material.

INSTALLATION

Single source responsibility, with in-house project management and installation crews. This approach reduces duplication of efforts throughout the enterprise, focused on delivering projects on time and within budget.

GROUND MOUNT • ROOF MOUNT • SPECIALTY STRUCTURES • LANDFILL

Racking questions? We are here to answer.
Contact us at info@rbisolar.com or call (513)242-2051

www.rbisolar.com

RBI SOLAR

Photovoltaic End of Life Decommissioning Plan

Decommissioning to be performed by Green Development, LLC

GREEN development, LLC
3760 Quaker Lane,
North Kingstown, RI 02852
Office: 401-295-4998

Table of Contents

3760 Quaker Lane,
North Kingstown, RI 02852
Office: 401-295-4998

1. Project Description

Green Development, LLC (The Company) is the parent company that develops, owns and operates electric generation facilities for municipalities and other state entities. The company offers a complete solution for the ownership and maintenance of the solar energy systems over the full length of the project life. GD Richmond Beaver River I, LLC is an entity created specifically for this project.

The GD Richmond Beaver River I Project (The Project) is a 5.25 megawatt (MW) AC solar energy facility located in Richmond, Rhode island. The project is installed on an existing 41.76 acre privately owned single parcel which had formerly served an agricultural land use with a single family home.

The Project will be contracted to operate continuously for the 20-25 year term of a power purchase agreement (PPA).

2. Initiation of Decommissioning Activities

The anticipated life of The Project is a minimum of 35 years, given that the modules and other equipment have a longer design and useful life. If, after the expiration of the initial PPA, another power purchase agreement cannot be secured the owner of The Project could decommission the facility. Decommissioning activities will be initiated within twelve months of this defined project End of Life (EOL).

3. Decommissioning Processes

If The Project contract is not renewed, the equipment not refreshed, or the land lease not extended, the equipment will be dismantled at The Project EOL. If desired by the property owners, the land will be restored to their pre-construction state as an agricultural land use.

If The Project is to be decommissioned and the equipment is to be removed, the impacts will be similar to the construction phase. All decommissioning of electrical devices, equipment, and wiring/cabling will be conducted in accordance with local, municipal, provincial and federal standards and guidelines. Any electrical decommissioning will include obtaining the required permits and following procedures before de-energizing, isolating, and disconnecting electrical devices, equipment and wiring/cabling. The procedures will include the following.

3.1. Permits and AHJ Approvals

Prior to beginning decommissioning activities, it is anticipated that a Building, Demolition, or Electrical permit will be required. The Project owner will apply for all applicable permits through the proper authorities ensure compliance with all federal and local codes and standards.

3.2. Utility Disconnect

Following permitting, The Project will work in conjunction with the interconnection utility to disconnect the system and restore the utility to normal operation without the distributed generation. Removal of the utility equipment located on the property will be performed by the utility and coordinated by the Company.

3.3. Laydown

In order to provide sufficient area for the laydown of the disassembled panels and racking and loading onto trucks, a minimal amount of area will be cleared, levelled and made accessible. The topsoil may be disturbed and some material may need to be added.

3.4. Equipment Use

Equipment will include, at a minimum: The use of cranes to remove the panels, racking, inverters and transformers and the use of trucks for the removal of panels, racking, inverters and transformers.

3.5. Stormwater Management

The Project stormwater management plan will continue to be in effect for the duration of the project life. Decommissioning of the project site will be conducted using best management practices.

During decommissioning, mitigation measures like those used for a construction site (e.g., sediment and erosion controls) will be implemented and maintained and inspected by the Environmental Site Inspector. The company will be responsible for preparing and submitting environmental monitoring reports to ensure conformance with applicable regulatory requirements. Driveways, swales, and retention ponds (if installed) will be removed unless arrangements are made with the property owners to leave them in place. Driveway bedding material will be removed and replaced with clean subsoil and loam for reuse by the landowner for agricultural or other purposes.

3.6. Solar Modules and Racking removal

All solar modules will be disconnected, removed from the racks, packaged and transported to a designated location for resale, recycling or disposal. If the modules are not to be reused in a different location, the glass and silicon will be reclaimed and the aluminum frames will be recycled. Any disposal or recycling will be done in accordance with local by-laws and requirements. The connecting underground cables and the junction boxes will be de-energized, disconnected and removed.

The racking structure supporting the modules will be disassembled using standard hand tools, possibly assisted by a small portable crane. The vertical steel posts supporting the racks and all steel support posts will be completely removed by mechanical equipment and transported off-site for

salvage (driven piles).

Any demolition debris that is not salvageable will be transported by truck to an approved disposal area. Other salvageable equipment and/or material will be removed from the site for resale, scrap value or disposal depending on market conditions.

3.7. Other Components

Unless retained for other purposes, and at the request of the property owners, removal of all other facility components from the site will be completed, including but not limited to roadways, concrete equipment pads, stormwater management devices, and fencing. Anything deemed usable shall be recovered and reused. All other remaining components will be considered as waste and managed according to federal, provincial and municipal requirements.

For safety and security, the security fence will be the final component dismantled and removed from the site.

4. Land Restoration

Decommissioning of The Project will not result in any adverse impacts to surface or groundwater quality. The Project doesn't include any permanent changes to the original use the property and the agricultural use of the areas will be accomplished by ensuring all equipment is removed from the site and top soil and loam are installed and graded in conjunction with the property owner's agricultural needs.

5. Disposal of non-recycled components

The waste generated by the installation, operation and decommissioning of The Project is minimal, and there are no toxic residues. Any wastes generated will be disposed of according local and federal standards with the goal of maximizing the recycling of decommissioned materials and equipment.

3760 Quaker Lane,
North Kingstown, RI 02852
Office: 401-295-4998

Appendix A : Cost Estimate for Decommissioning

Estimated Costs for Solar Decommissioning

Project Name: GD Richmond Beaver River I, LLC

Date: 4/19/2018

Component	Disposal Costs	Labor Cost	Value of Recycled Materials	Net Cost	Notes/Comments
Concrete Pads	$ 10,000	$ 5,000	$ -	$ 15,000	Racking posts to be driven, not ballast design
Steel Posts	$ -	$ 66,596	$ 55,497	$ 11,099	
Aluminum Racking	$ 5,550	$ 33,298	$ 166,490	$ (127,643)	
PV - Modules	$ -	$ 99,894	$ -	$ 99,894	Secondary market for used solar panels not considered
Wiring, Tranformers, Switchgear	$ 49,947	$ 149,841	$ 183,140	$ 16,649	
Chain Link Fence and posts	$ 22,199	$ 33,298	$ 11,099	$ 44,397	
Re-seeding diturbed areas / Other	$ -	$ 33,298	$ -	$ 33,298	As needed
			Total Costs =	$ 92,696	

Note: Costs above were pro-rated based on system size from approved bond estimate provided to the Town of Richmond for Bucknam Road solar in 2017.

RICHMOND HISTORICAL SOCIETY 1747

Wyoming, Rhode Island 02898

4 June 2019

To the Honorable Richmond Town Council

Dear Council Members:

The Richmond Historical Society (RHS) is in favor of the preservation and marking of historic sites and unique historic landscapes. The Society is also in favor of alternative forms of energy production such as solar energy. Unfortunately, on occasion these two may come into conflict. This occurs when commercial solar panel arrays are inappropriately sited destroying unique historic landscapes.

Our Town's heritage is rooted deeply in agriculture and its resulting rural beauty. Many of our pastures and open fields are unique landscapes of historic significance. On these pastures grazed the sheep that produced the wool that in turn led to the mills and our mill villages. Ergo, siting of commercial solar arrays on these fields destroys their beauty, is contrary to our rural heritage, and affects the quality of life for all Richmond citizens.

The Society is especially concerned with the siting of solar arrays in the Beaver River Valley. In 2001 the State Historic Preservation and Heritage Commission conducted a survey of State historic sites and landscapes. Richmond's Beaver River Valley was designated an historic and unique landscape. Hence, the RHS respectfully requests that the applications for siting of commercial arrays in the Beaver River Valley not be approved.

This problem is not, however, limited to the Beaver River Valley. Other sites throughout the Town have been suggested for commercial solar arrays. These are often in overlay districts and require special permitting. Rather than consider the impact of each application separately the Society suggests that a moratorium on all commercial solar arrays be enacted until the problem can be more carefully addressed.

Thanking you for your consideration, I remain,

Yours sincerely,

R E Wolke

R. E. Wolke, Pres.

Cc: Richmond Planning Board

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:

DESIGNED BY:

CHECKED BY:

REGISTERED PROFESSIONAL

NOT FOR CONSTRUCTION

PREPARED BY

BETA
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SUBCONSULTANT

SCALE

20 0 20 40
SCALE IN FEET: 1"=20'

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE

LANDSCAPE PLAN

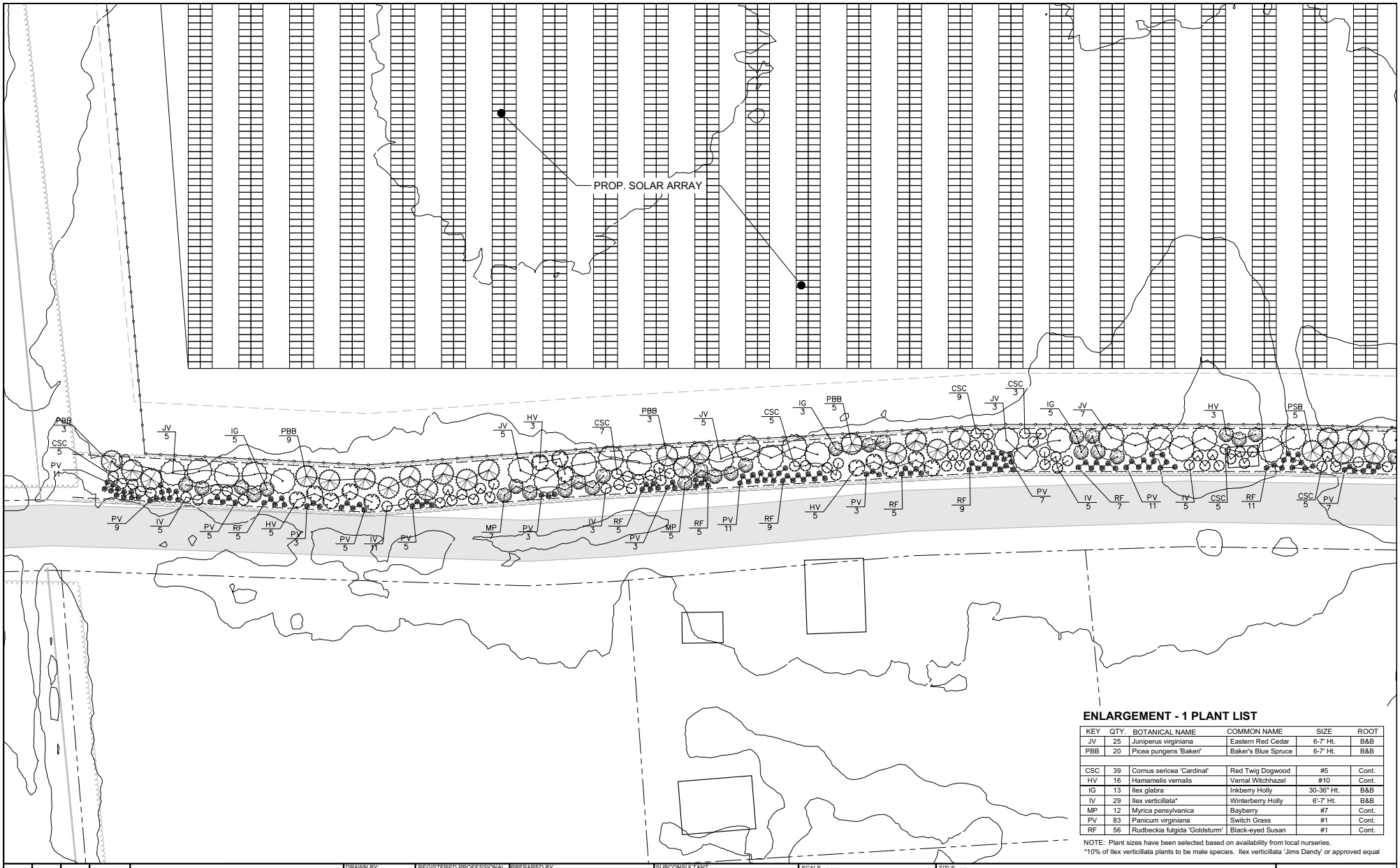
GD RICHMOND BEAVER RIVER I

172 BEAVER RIVER ROAD. RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

BETA JOB NO. 5479

ISSUE DATE 4/19/2018

SHEET NO. **L1.0** of **5**



ENLARGEMENT - 1 PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
JV	25	Juniperus virginiana	Eastern Red Cedar	6-7' Ht.	B&B
PBB	20	Picea pungens 'Bakeri'	Baker's Blue Spruce	6-7' Ht.	B&B
CSC	39	Cornus sericea 'Cardinal'	Red Twig Dogwood	#5	Cont.
HV	16	Hamamelis vernalis	Vernal Witchhazel	#10	Cont.
IG	13	Ilex glabra	Inkberry Holly	30-36" Ht.	B&B
IV	29	Ilex verticillata*	Winterberry Holly	6'-7' Ht.	B&B
MP	12	Myrica pensylvanica	Bayberry	#7	Cont.
PV	83	Panicum virginiana	Switch Grass	#1	Cont.
RF	56	Rudbeckia fulgida 'Goldsturm'	Black-eyed Susan	#1	Cont.

NOTE: Plant sizes have been selected based on availability from local nurseries.
*10% of Ilex verticillata plants to be male species. Ilex verticillata 'Jims Dandy' or approved equal

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LANDSCAPE PLAN - ENLARGEMENT 1

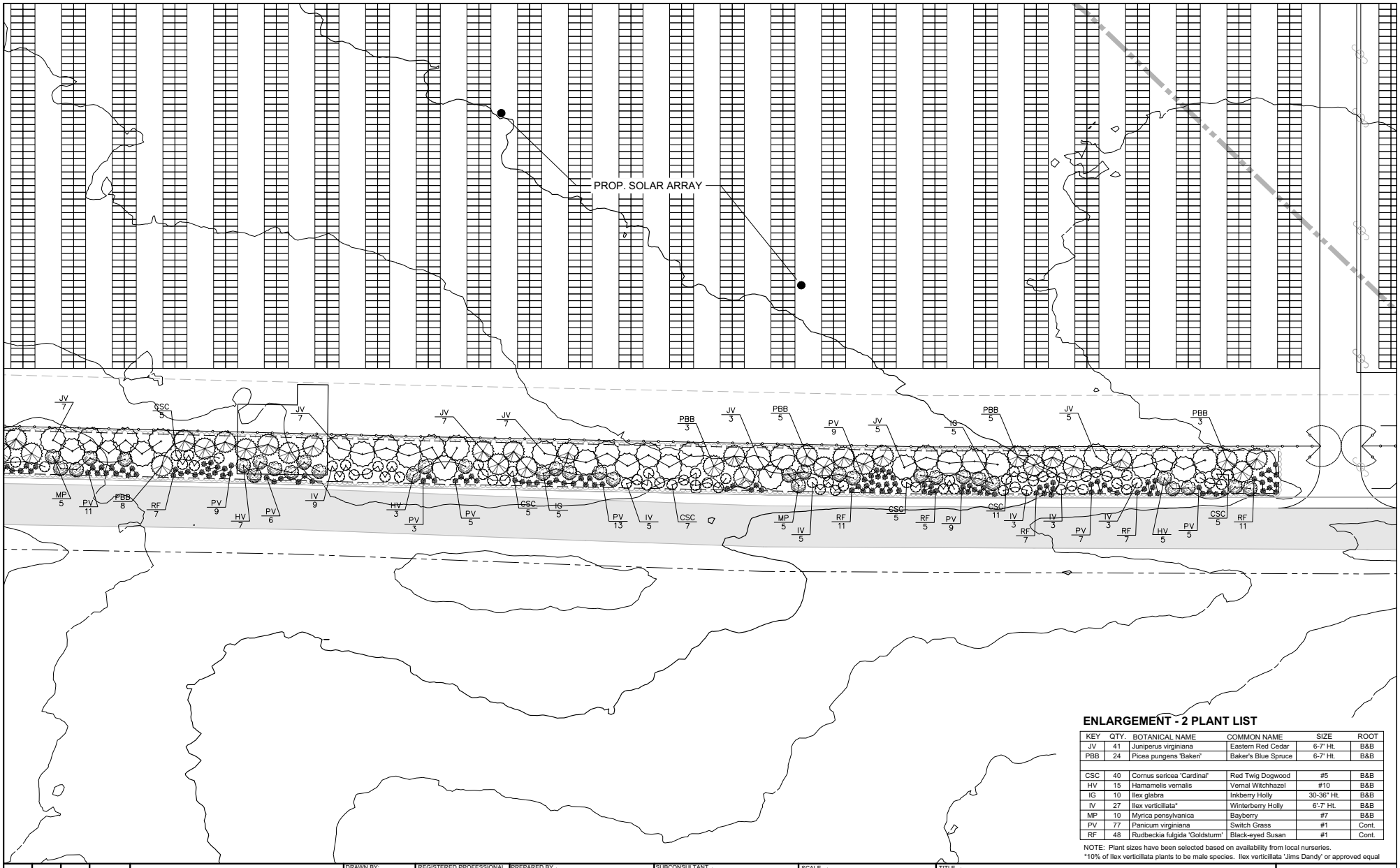
GD RICHMOND BEAVER RIVER I

172 BEAVER RIVER ROAD. RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

BETA JOB NO. 5479

ISSUE DATE 4/19/2018

SHEET NO. **L1.1** of **5**



ENLARGEMENT - 2 PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
JV	41	Juniperus virginiana	Eastern Red Cedar	6-7' Ht.	B&B
PBB	24	Picea pungens 'Bakeri'	Baker's Blue Spruce	6-7' Ht.	B&B
CSC	40	Cornus sericea 'Cardinal'	Red Twig Dogwood	#5	B&B
HV	15	Hamamelis vernalis	Vernal Witchhazel	#10	B&B
IG	10	Ilex glabra	Inkberry Holly	30-36" Ht.	B&B
IV	27	Ilex verticillata*	Winterberry Holly	6'-7' Ht.	B&B
MP	10	Myrica pensylvanica	Bayberry	#7	B&B
PV	77	Panicum virginiana	Switch Grass	#1	Cont.
RF	48	Rudbeckia fulgida 'Goldsturm'	Black-eyed Susan	#1	Cont.

NOTE: Plant sizes have been selected based on availability from local nurseries.
*10% of Ilex verticillata plants to be male species. Ilex verticillata 'Jims Dandy' or approved equal

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

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TITLE

LANDSCAPE PLAN - ENLARGEMENT 2

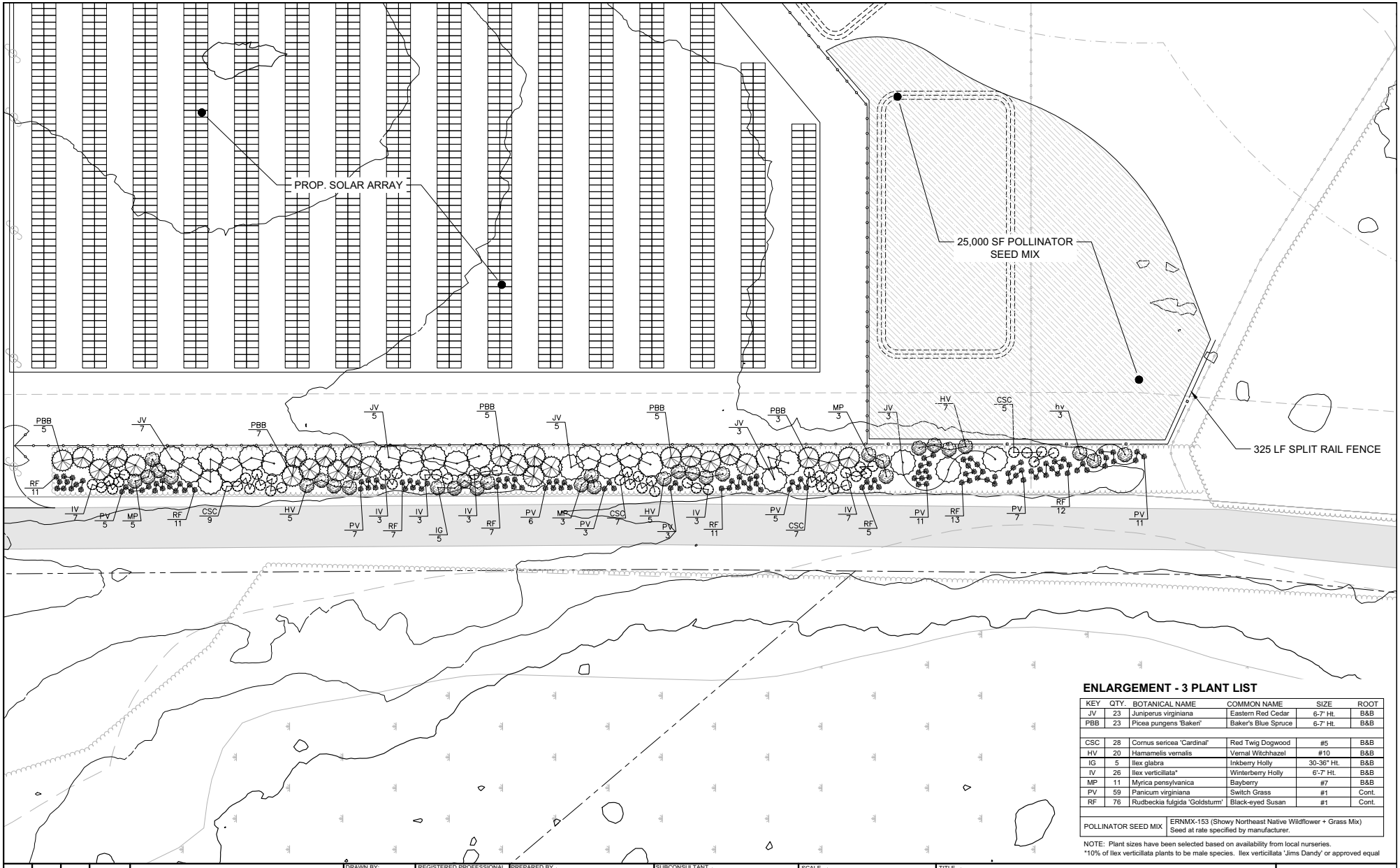
GD RICHMOND BEAVER RIVER I

172 BEAVER RIVER ROAD. RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

BETA JOB NO. 5479

ISSUE DATE 4/19/2018

SHEET NO. **L1.2** of **5**



ENLARGEMENT - 3 PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
JV	23	Juniperus virginiana	Eastern Red Cedar	6-7' Ht.	B&B
PBB	23	Picea pungens 'Bakeri'	Baker's Blue Spruce	6-7' Ht.	B&B
CSC	28	Cornus sericea 'Cardinal'	Red Twig Dogwood	#5	B&B
HV	20	Hamamelis vernalis	Vernal Witchhazel	#10	B&B
IG	5	Ilex glabra	Inkberry Holly	30-36" Ht.	B&B
IV	26	Ilex verticillata*	Winterberry Holly	6'-7' Ht.	B&B
MP	11	Myrica pensylvanica	Bayberry	#7	B&B
PV	59	Panicum virginiana	Switch Grass	#1	Cont.
RF	76	Rudbeckia fulgida 'Goldsturm'	Black-eyed Susan	#1	Cont.
POLLINATOR SEED MIX		ERNMX-153 (Showy Northeast Native Wildflower + Grass Mix) Seed at rate specified by manufacturer.			

NOTE: Plant sizes have been selected based on availability from local nurseries.
*10% of Ilex verticillata plants to be male species. Ilex verticillata 'Jims Dandy' or approved equal

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

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CHECKED BY:

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LANDSCAPE PLAN - ENLARGEMENT 3

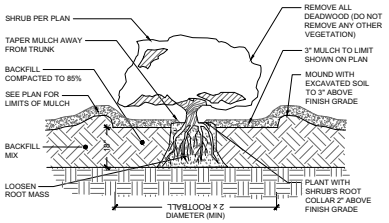
GD RICHMOND BEAVER RIVER I

172 BEAVER RIVER ROAD. RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

BETA JOB NO. 5479

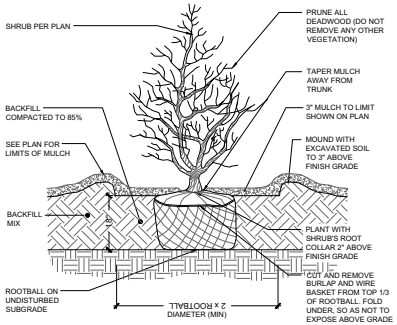
ISSUE DATE 4/19/2018

SHEET NO. **L1.3** of **5**



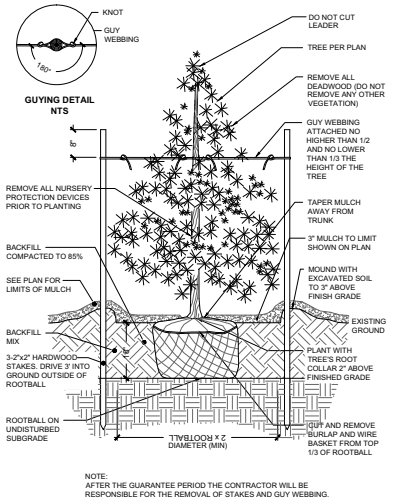
CONTAINER GROWN TREE & SHRUB PLANTING

SCALE: NOT TO SCALE



SHRUB PLANTING

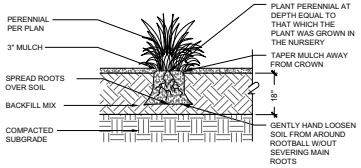
SCALE: NOT TO SCALE



NOTE:
AFTER THE GUARANTEE PERIOD THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REMOVAL OF STAKES AND GUY WEBBING.

EVERGREEN TREE STAKING & PLANTING

SCALE: NOT TO SCALE



PERENNIAL AND GROUND COVER PLANTING

SCALE: NOT TO SCALE

SPLIT RAIL FENCE - PRECEDENT IMAGE

JUNIPERUS VIRGINIANA - EASTERN RED CEDAR

PICEA PUNGENS 'BAKERII' - BAKER'S BLUE SPRUCE

CORNUS SERICEA 'CARDINAL' - RED TWIG DOGWOOD

ILEX GLABRA - INKBERRY HOLLY

HAMAMELIS VERNALIS - VERNAL WITCHHAZEL

MYRICA PENNSYLVANICA - BAYBERRY

ILEX VERTICILLATA - WINTERBERRY HOLLY

PANICUM VIRGINIANA - SWITCH GRASS

RUDBECKIA FULGIDA 'GOLDSTURM' - BLACK EYED SUSAN

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

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DESIGNED BY:
CHECKED BY:

REGISTERED PROFESSIONAL

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PREPARED BY

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SCALE IN FEET: 1"=20'

TITLE

LANDSCAPE PLAN - DETAILS

GD RICHMOND BEAVER RIVER I

172 BEAVER RIVER ROAD. RICHMOND, RI 02812
ASSESSOR'S PLAT 8E LOT 12

BETA JOB NO. 5479

ISSUE DATE 4/19/2018

SHEET NO. **L1.4** of **5**

Stormwater Operation and Maintenance Plan

December 2018

Project Name: GD Richmond Beaver River I

Project Location: 172 Beaver River Road, Richmond, RI 02812
Applicant: GD Richmond Beaver River I LLC, 3760 Quaker Ln, North Kingstown, RI 02852
Owner: William M. Stamp Jr, Trustee, One Stamp Place, Exeter, RI 02882

Table of Contents

Executive Summary

The purpose of this report is to satisfy 3.2.11 Minimum Standard 11: Stormwater Management System Operation and Maintenance as outlined in the Rhode Island Stormwater Design and Installation Standards Manual (RISDISM). The proposed project is identified as:

Project Name: GD Richmond Beaver River I

Project Location: 172 Beaver River Road Richmond, RI

Assessors Plat/Lot: 8E / Lot 12

The site is occupied by an existing single-family home and agricultural fields primarily farmed for corn. The proposal is to demolish the existing home, convert a portion of the project to a solar facility, and the remaining agricultural fields to remain for pasture and/or harvesting hay.

The conversion of existing agricultural areas that are farmed for row crops during the growing season and fallow for the remainder of the year to hay/pasture land outside the solar array and grass under the solar array will improve the runoff conditions from pre-development to post-development. The primary focus will to capture sediments during the transition from farm to solar and the limited disturbance required for solar.

The nature of the fields requires no grading except for trenching for underground utility connections and temporary soil erosion and sediment control measures.

The long-term operation and maintenance will focus on ensuring that the ground surface is stabilized and monitoring for erosion and the conditions of the access driveway over time. This report will demonstrate compliance with requirement 1-7 as identified in Section 3.2.11 of the RISDISM.

1.0 Stormwater Management System Owners

This project results in a long-term lease of 20-25 years in duration between a property owner (Lessor) and the proponent of the solar project (Lessee). The terms of these long-term leases stipulate that the lessee is responsible for the long-term upkeep of the facility and anything required by them from local, state, or federal permits. This operation and maintenance document and plans are part of that obligation.

Lessor: William M. Stamp Jr., Trustee

Lessee: GD Richmond Beaver River I, LLC

2.0 Responsible Parties

Stormwater BMP's are maintained during construction by the site contractor stipulated in the Soil Erosion and Sediment Control Plan (SESC). The SESC outlined the monitoring, inspection, reporting, and maintenance requirements through the construction phase. Once the construction is complete as well as any associated contractor's warranty for the work, the contractor must assign the responsibilities for maintenance and inspection to the Lessee or the designated authority acting behalf of the Lessee to manage the asset. In the event the lease assigns the lease to a new entity the responsibilities must also be assigned at that time.

3.0 General Site Inspections

The Lessee is responsible for conducting general site inspections when conditions warrant. In some cases, these inspections may require specialized equipment necessary to conduct a thorough and accurate inspection. The type of inspections required will be based on the operational characteristics of the site and stormwater management practices in place.

The inspection process shall document all human and mechanical observations made in the field. These items shall include but are not limited to the following:

- Evidence of vandalism
- Unsafe Conditions
- Build-up of Trash
- Soil erosion and build-up of sediments
- Occurrence of obstructions such as fallen trees or tree limbs
- Structural conditions
- Hydraulic operational conditions
- Condition of BMP's

Since some inspections may require specialized equipment, some maintenance tasks can be effectively handled on a contract basis with an outside entity specializing in that field. Some maintenance may also require a formal design and bid process to accomplish the work. This may be done at the Lessee's discretion.

4.0 Maintenance Tasks for BMP's

The success of any BMP is a function of the initial installation as well as follow-up inspections and operation and maintenance over the life of the project.

The nature of the renewable energy projects requires periodic operation and maintenance as well as inspections that lend itself to a successful BMP program. As per the RISDISM it is not mandatory that all inspectors be trained engineers, but they should have some knowledge or experience with stormwater systems. In general, trained engineers should, however, direct them. Inspections by registered engineers should be performed where routine inspection has revealed a question of structural or hydraulic integrity affecting public health, safety, or welfare. The RI Stormwater Design and Installation Standards Manual us available as a resource and general reference and specifically Appendix E relating to operation and maintenance as well as other sections specific to BMP's.

(Link to document: www.dem.ri.gov/pubs/regs/regs/water/swmanual15.pdf)

This section details the required routine and non-routine maintenance tasks for each BMP that is required post-construction completion. A schedule associated with these activities is also assigned.

4.1 Routine Maintenance Tasks

Typically, no more than once per month, less during non-growing season.

The routine maintenance tasks associated with this project include the following:

- Overall site inspection to check site conditions, status of vegetation growth, access driveway, perimeter fencing, etc.
- Vegetation maintenance (mowing during growing season and stabilization of eroded areas if noted during visits)
- Removal of trash/debris

4.2 Non-routine Maintenance Tasks

- Erosion of permeable access driveways and/or vegetated areas due to an extreme storm event
- Removal of sediments as the result of erosion
- Upon inspection, occasional regrading of the permeable access driveways crushed stone may be required in order to ensure its long-term surface perviousness.

4.3 Snow Removal

- Snow shall be stored in upland areas only. Snow storage adjacent to any wetlands or bodies of water is prohibited.
- Snow shall not be dumped in any wetland, bodies of water, rivers, streams, lakes, ponds, bay or ocean.

5.0 Stormwater Management Plan

This attached stormwater management plan depicts the location of all stormwater BMP's in each treatment train along with the discharge point. This site is unique because once the site is construction and stabilized this achieves the required stormwater management. The assumption is that the existing agricultural fields utilized for row crops (primarily corn) are stabilized with permanent cover and maintained over the life of the project.

6.0 Public Safety

The overall public safety elements of this project include the following:

- 6' Chain link security fence surrounding the solar installation and equipment
- A locked gate prohibiting unauthorized access
- A lock box to allow for emergency fire department access if needed
- Warning signage as required by National Electric Code

The stormwater related public safety elements incorporated in the site design include the following:

- Access driveway for inspections and access to BMP's in construction and post-construction
- Utilizing existing topography for the proposed solar that is gently sloping and allows for easy access throughout
- Periodic inspections within the array and downstream areas to ensure that the site and downgradient areas are stabilized, and soil erosion does not occur.

7.0 Landscape Management

The following standards for ground management shall be maintained by the Lessee.

7.1 Grass Selection

The site design specifies a slow, low-growth, low-maintenance seed mixture. Below is Table G-3 *Drought Tolerance of Turfgrass Types* located in Appendix G of the Rhode Island Stormwater Design and Installation Standards Manual.

Turfgrass Type	Drought Tolerance
Fine-leaved Fescues	High
Tall Fescue	|
Kentucky Bluegrass	|
Perennial Ryegrass	\/
Bentgrasses	Low

Lessee shall choose a ground cover type based suited for the site considering the seasonal variations in rainfall and temperature.

7.2 Mowing and Thatch Management

Grass shall be cut 3-4 times per year or as needed. The Lessee should allow grass to grown between 12-18 inches in height before cutting. Where proposed, infiltration basins should be mowed at least twice per year.

To prevent insects and weed problems, the Lessee should not cut grassed areas shorter than 2 to 3 inches, because weeds can grow more easily in short grasses. Grass can be cut lower in the spring and fall to stimulate root growth, not shorter than 1 ½ inches.

7.3 Fertilization

Fertilizing is not proposed for this project, except at the initial plating stage to promote establishment. However, if it becomes necessary the Lessee must follow these conditions:

- Most lawns require little or no fertilizer to remain healthy. Fertilize no more than twice a year if necessary, once in May-June and once in September-October.
- Fertilizers are rated on their labeling by three numbers (10-10-10 or 12-4-8), which refer to the Nitrogen (N), Phosphorus (P), and Potassium (K) concentrations. Fertilize at a rate of no more than ½ a pound of nitrogen per 1000 square feet, which can be determined by dividing 50 by the percentage of nitrogen the fertilizer. A low phosphorous fertilizer is required due to the downstream impairment for phosphorous.
- Apply fertilizer carefully to avoid spreading on impervious surfaces such as concrete equipment pads and access driveway, where the nutrient can be easily washed into surface waters.
- To encourage more complete uptake, use slow-release fertilizers that is those that contain 50 percent or more water-insoluble nitrogen (WIN).
- Grass blades retain 30-40 percent of nutrients applied in fertilizers. Leave clippings on the lawn where they will degrade and release stored nutrients back to the soil.
- Fertilizer should not be applied when rain is expected. Not only does the rain decrease fertilizer effectiveness, it also increases the risk of surface and ground water contamination.

7.4 Weed Management

The Lessee is responsible for removal of weeds within the property. The following are a list of techniques the Lessee can use for weed removal.

- To the extent practical, weeds should be dug out.
- If patches of weeds are present, they can be covered for a few days with a black plastic sheet, and technique called solarization. Solarization kills the weeds while leaving the grass intact.
- If weeds blanket a large enough area, the patch can be covered with clear plastic for several weeks, effectively “cooking” the weeds and their seeds. The bare area left behind after weeding should be reseeded to prevent weeds from growing back.

7.5 Pest Management

No pest management or chemical pesticides are proposed for this project. However, if it becomes necessary the Lessee should monitor plants for obvious damage and check for the presence of pest organisms. When damage is detected, and controls are needed, the Lessee can use the following variety of low-impact pest management controls and practices.

- Visible insects can be removed by hand and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off a plant with water, or in some cases vacuumed off larger plants.
- Store-bought traps, such as species-specific, pheromone-bases traps or colored sticky cards, can be used.
- Sprinkling the ground surface with abrasive diatomaceous earth can prevent infestations by soft-bodies insects and slugs. Slugs can also be trapped by falling or crawling into small cups set in the ground flush with the surface and filled with beer.
- In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of.
- Lessee can encourage/attract beneficial organisms. These desirable organisms can be introduced directly or can be attracted to the area by providing food and/or habit.

Chemical pesticides will not be used.

8.0 Operation and Maintenance Budget

An estimate of annual operation and maintenance costs is provided based on the nature of the BMP's associated with this project. For this project there are no long term stormwater BMP's that are necessary but an estimated annual cost for inspections and periodic upkeep of the access driveway and repairing erosion areas as needed is estimated at $2k-5k/year assuming the site is fully stabilized entering the O&M stage. This does not include costs for mowing, snow plowing, or upkeep for the solar infrastructure itself.

9.0 Funding for O&M Budget

The project creates revenue from the generation of electric power, so the funding is in place as a result through the long-term lease and associated agreements. As the operator of an asset fees are allocated to provide for maintenance of equipment and the site overall (mowing, inspections, cleaning, etc.).

Appendix A: RIDEM Sample Stormwater Facility Maintenance Agreement

THIS AGREEMENT, made and entered into this ___ day of _____, 20___, by and between (Insert Full Name of Owner) _____ hereinafter called the "Landowner", and the [Local Jurisdiction], hereinafter called the "[Town/City]". WITNESSETH, that

WHEREAS, the Landowner is the owner of certain real property described as (Tax Map/Parcel Identification Number) _____ as recorded by deed in the land records of [Local Jurisdiction] Deed Book _____ Page _____, hereinafter called the "Property".

WHEREAS, the Landowner is proceeding to build on and develop the property; and WHEREAS, the Site Plan/Subdivision Plan known as _____, (Name of Plan/Development) hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be approved by the [Town/City], provides for detention of stormwater within the confines of the property; and

WHEREAS, the [Town/City] and the Landowner, its successors and assigns, including any homeowners association, agree that the health, safety, and welfare of the residents of [Local Jurisdiction] require that on-site stormwater management facilities be constructed and maintained on the Property; and

WHEREAS, the [Town/City] requires that on-site stormwater management facilities as shown on the Plan be constructed and adequately maintained by the Landowner, its successors and assigns, including any homeowners association.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management facilities shall be constructed by the Landowner, its successors and assigns, in accordance with the plans and specifications identified in the Plan.

2. The Landowner, its successors and assigns, including any homeowners association, shall adequately maintain the stormwater management facilities in accordance with the required Operation and Maintenance Plan. This includes all pipes, channels or other conveyances built to convey stormwater to the facility, as well as all structures, improvements, and vegetation provided to control the quantity and quality of the stormwater. Adequate maintenance is herein defined as good working condition so that these facilities are performing their design functions. The Stormwater Best Management Practices Operation, Maintenance and Management Checklists are to be used to establish what good working condition is acceptable to the [Town/City].

3. The Landowner, its successors and assigns, shall inspect the stormwater management facility and submit an inspection report annually. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structure, basin areas, access roads, etc. Deficiencies shall be noted in the inspection report.

4. The Landowner, its successors and assigns, hereby grant permission to the [Town/City], its authorized agents and employees, to enter upon the Property and to inspect the stormwater management facilities whenever the [Town/City] deems necessary. The purpose of inspection is to follow-up on reported deficiencies and/or to respond to citizen complaints. The [Town/City] shall provide the Landowner, its successors and assigns, copies of the inspection findings and a directive to commence with the repairs if necessary.

5. In the event the Landowner, its successors and assigns, fails to maintain the stormwater management facilities in good working condition acceptable to the [Town/City], the [Town/City] may enter upon the Property and take whatever steps necessary to correct deficiencies identified in the inspection report and to charge the costs of such repairs to the Landowner, its successors and assigns. This provision shall not be construed to allow the [Town/City] to erect any structure of permanent nature on the land of the Landowner outside of the easement for the stormwater management facilities. It is expressly understood and agreed that the [Town/City] is under no obligation to routinely maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the [Town/City].

6. The Landowner, its successors and assigns, will perform the work necessary to keep these facilities in good working order as appropriate. In the event a maintenance schedule for the stormwater management facilities (including sediment removal) is outlined on the approved plans, the schedule will be followed.

7. In the event the [Town/City] pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner, its successors and assigns, shall reimburse the [Town/City] upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by the [Town/City] hereunder.

8. This Agreement imposes no liability of any kind whatsoever on the [Town/City] and the Landowner agrees to hold the [Town/City] harmless from any liability in the event the stormwater management facilities fail to operate properly.

9. This Agreement shall be recorded among the land records of [Local Jurisdiction] and shall constitute a covenant running with the land, and shall be binding on the Landowner, its administrators, executors, assigns, heirs and any other successors in interests, including any homeowners association.

WITNESS the following signatures and seals: _____
Company/Corporation/Partnership Name (Seal)

By: _____

_____ (Type Name and Title)

The foregoing Agreement was acknowledged before me this ____ day of _____, 20___, by _____ ___.
_____ NOTARY PUBLIC My Commission Expires: _____

By: _____
_____ (Type Name and Title)

The foregoing Agreement was acknowledged before me this ____ day of _____, 20___, by _____ ___.
_____ NOTARY PUBLIC My Commission Expires: _____

Approved as to Form: _____ _____ [Town/City] Attorney Date

Appendix B: Checklists

Stone Access Drive Operation, Maintenance, And Management Inspection Checklist

Project: _____

Location: _____

Site Status: _____

Date: _____

Time: _____

Inspector: _____

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Semi-Annual inspections for trash and debris (Remove trash and/or debris if present)		
Semi-Annual inspections for soil erosion and evidence of channelized flows (Soil erosion and channels must be corrected immediately. Reestablish original grad; rake existing stone or apply new stone as necessary)		
Semi-Annual inspection for excessive sediments (Remove sediments if present. Eliminate sediment source)		
Semi-Annual confirmation number of vehicle trips over stone access path (One pickup truck load per month is anticipated)		
Semi-Annual and 72 hours after all significant storms (1-year 2.7" or greater), check for standing water within stone access. If standing water present, stone material shall be removed and replaced with new clean washed stone.		

Comments: _____

_____

_____

_____

Stone Access Drive Operation, Maintenance, And Management Inspection Checklist

Project: _____

Location: _____

Site Status: _____

Date: _____

Time: _____

Inspector: _____

Necessary Actions to be taken: _____

_____

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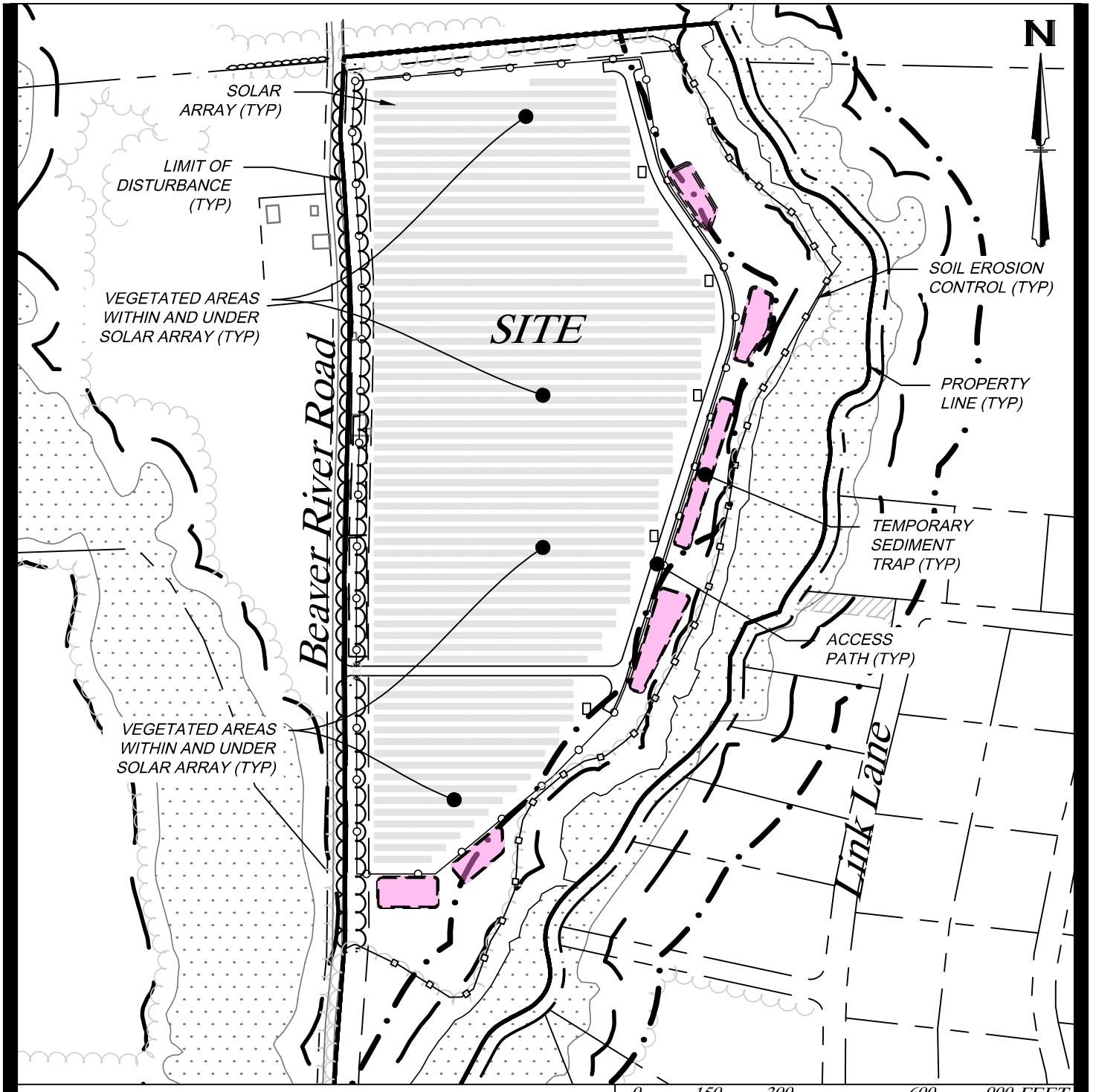
Appendix C: O&M Plan



O&M Plan

PROJECT INFORMATION:

GD Richmond Beaver River I

172 BEAVER RIVER ROAD, RICHMOND, RI 02812

APPLICANT:

GD Richmond Beaver River I, LLC

3760 QUAKER LANE, NORTH KINGSTOWN, RI 02852

PREPARED FOR:

William M. Stamp Jr, Trustee

ONE STAMP PLACE, EXETER, RI 02822

3760 Quaker Lane
North Kingstown, RI 02852
(401) 295-4998
www.green-ri.com

GREEN development, LLC

7.45-Megawatt Solar Installation Development
Major LDP and SUP Application

172 Beaver River Road
Assessor's Plat 8E; Lot 12

Prepared for: GD Richmond Beaver River I

By: Pimentel Consulting, Inc.

14 May 2019

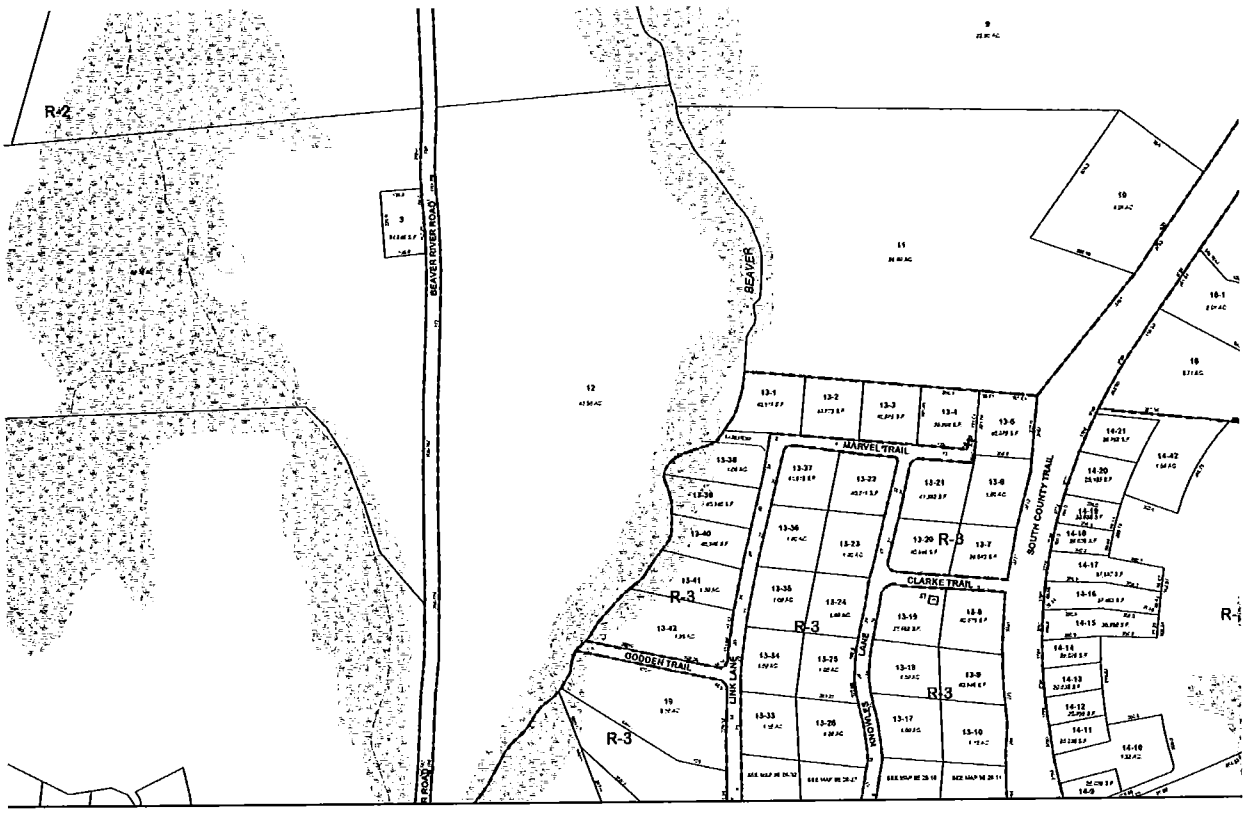
INTRODUCTORY STATEMENT

GD Richmond Beaver River I (hereafter 'applicant') has retained my professional land use planning and zoning consulting services, in order to evaluate the proposed '7.45 MW DC Solar Energy System' development (hereinafter 'SES Development'). The referenced SES development requires two (2) forms of regulatory approvals. First, the proposal is defined as a Development Plan Review project (hereinafter 'DPR'), pursuant to the Zoning Ordinance. This necessitates Planning Board administrative review, purely for advisory recommendation purposes, subject to the approval authority of the Zoning Board of Review (hereinafter 'ZBR'). The proposed SES Development likewise necessitates the approval of the ZBR, considering it is permitted by Special Use Permit (hereinafter 'SUP'), otherwise deemed a 'conditionally permitted' land use. The proposed SES Development will not only realize provision of clean, efficient and affordable energy (both locally and regionally), in furtherance of the respective Town of Richmond Comprehensive Plan and State Energy Plan goals and objectives, but also be a fiscal contributor. SES installations are unlike any other utility; contributing on a variety of levels, without any corresponding negative concerns. SES installations are quite typically located in residential districts (given the vast acreage dedicated to such land usage), and yet unlike **permissible** revenue draining and permanently disturbing residential land usage, the referenced installations are revenue positive. They neither require infrastructure on the level of a residential development, nor necessitate any community resources (most notably educational services).

In light of the referenced SES Development, this land use consultant has conducted a thorough analysis of the respective application, site plan and supporting project materials, as well as the following regulatory documents: Town of Richmond Zoning Ordinance (hereafter 'Ordinance'); Land Development and Subdivision Regulations (hereinafter 'Development Regulations'); Town of Richmond, RI, Comprehensive Community Plan - Amended through 12 August 2014 (hereafter 'Comprehensive Plan'); RI Comprehensive Planning Standards Manual - Revised 14 June 2018 [hereinafter 'Standards Manual']; RI Comprehensive Planning Standards Guidance Handbook Series - Guidance Handbook No. 9 - Planning for Energy - Revised June, 2018 [hereinafter 'Energy Guidance Handbook']; State Guide Plan Element Report # 120 - Energy 2035 - Rhode Island State Energy Plan - Approved 8 October 2015 [hereafter 'State Energy Plan']; as well as conducting a thorough analysis of the immediate Beaver River Road neighborhood, said analysis including a thorough site and neighborhood inspection, as well as reviewing Property Record Data for land use assessment purposes. The purpose for the subject analysis is two-fold: evaluate the appropriateness of the proposed SES development, in light of the 'standards' for the granting of both the DPR and SUP; as well as render a professional opinion on the consistency of the overall proposal with the Comprehensive and Energy Plan(s).

GENERAL PROPERTY AND NEIGHBORHOOD DESCRIPTION

The property that is the focus of the SES development is addressed 172 Beaver River Road, otherwise designated Assessor's Plat 8E, Lot 12, and containing upwards of approximately 42-acres (hereinafter 'Property'). Lot 12 is almost entirely unimproved and unencumbered, with the vast majority being deemed 'upland' (suitably developable) land resources. In fact, the vast majority is already cleared fields, thereby requiring little to no tree clearing. This is perhaps the greatest concern raised by opponents of solar installation developments. The property is not only quite sizable, but also uniquely configured and situated. The property is basically triangular in configuration, being sandwiched between Beaver River Road and Beaver River. The property has in excess of 2,500 linear feet of lot frontage along Beaver River Road and far in excess of this quantity along the riverbank. Why this is so vitally important, is the resulting presence of vast, mature vegetation along the stated riverbank. The kind of vegetation that must be protected in perpetuity, thereby serving as natural buffer and screening. And coincidentally, the only residential presence of any magnitude is situated opposite Beaver River. The property is illustrated below, as excerpted from the Town's tax assessment plat records.

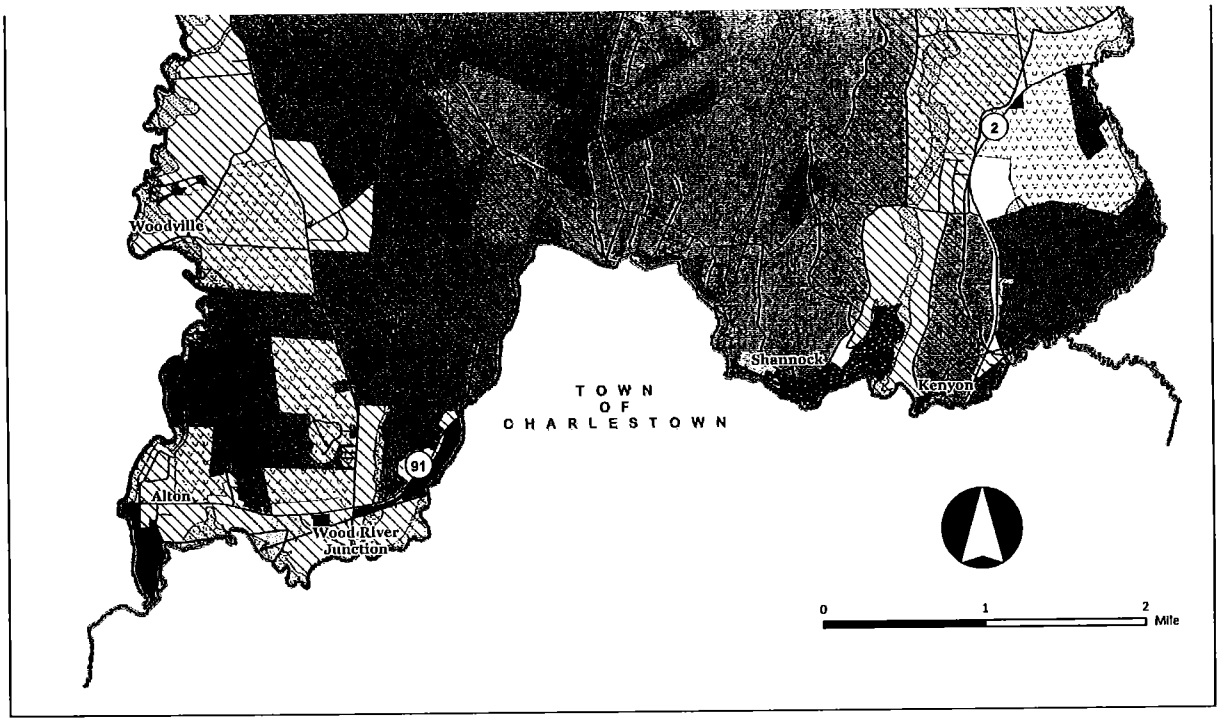


The property is zoned Residential R-3 District (hereinafter 'R-3 District'). In addition, the property has no fewer than two imposed (2) overlay districts, namely the Aquifer Overlay District (hereinafter 'AQOD) and the Agriculture Overlay District (hereinafter 'AGOD). The present zoning designation is consistent with the Comprehensive Plan, as evidenced by the Future Land Use map, which illustrates that the supportive corresponding land use classifications are 'Residential Low Density', and both the 'Agriculture' and 'Aquifer' Overlays.

The referenced land use classifications are defined by the Comprehensive Plan, in the following manner:

The Future Land Use Concept Plan - "*The Future Land Use Concept Plan illustrates Richmond's land use strategy and policies. It attempts to allocate sufficient land areas in multiple use categories to satisfy the identified need for land in each category over the next 20 years...The Future Land Use Concept Plan is meant solely to complement the plan's text by interpreting the intentions of the plan's goals and policies.*" [Pages 115 - 118]

Low Density Residential - "*Low Density Residential, or R-3, is an important category of preferred development strategy as* ***this zoning and level of density covers most of the town's northwest, southwest and southeast quadrants, as well as the center of Richmond****. These areas are a composite of significant natural features, cultural features, prime agricultural soils, open spaces, aquifer recharge and wellhead protection areas, as well as surface water buffer areas, all of which are compatible with low-density zoning.*"



RICHMOND COMPREHENSIVE COMMUNITY PLAN 2014

Map 13 - Future Land Use Plan
(adopted August 12, 2014)

- Infill and Growth Areas
- Potential Future Growth Area (to be studied)
- Municipal Border
- Roads
- Railway
- Agriculture Overlay District
- Aquifer Overlay District
- Flood Overlay District
- Protected Open Space
- Residential High Density
- Residential Medium Density
- Residential Low Density
- General Business
- Neighborhood Business
- Shannock Village
- Industrial
- Light Industrial
- Flex Tech
- Planned Development District
- Planned Unit Development-Village District

Data sources: Richmond GIS, RIGIS

MH 8/2014

Agricultural Overlay - "*The purpose of the agricultural overlay is to preserve and protect large areas of prime agricultural soils, as identified by the Soil Conservation Service. Two areas are delineated, one in the eastern portion of town, one in the western portion. Both areas presently are turf farms.*"

Aquifer Overlay District - "*The Aquifer Overlay areas primarily surround the river corridors in Richmond. The existing Overlay is based District should follow the aquifer regard area, delineated by available through the Rhode Island Geographic Information System (RIGIS) and RIDEM...**These areas require protection as present and future drinking water supplies.** The Zoning Map and Ordinance should be updated to reflect the most current maps available from the DEM for the overlay district. **If a property is located within such an overlay area, special regulations limit certain high risk uses through special use permits and or may be entirely prohibited**.*"

Town of Richmond is almost entirely residentially zoned, with upwards of 95% of town-wide acreage being designated a district that otherwise permits residential development as a matter-of-right. The R-3 District, single-handedly encompasses in excess of one-third (34.5%) of all town-wides resources. Point being that there is a great likelihood that the vast majority of land uses will otherwise be directed to land resources that are residentially zoned, inclusive of the R-3 District. It is therefore not surprising that a community that supports the introduction of renewable energy sources, specifically 'solar,' would deem them conditionally permissible within the R-3 District. The preceding information was excerpted from the Comprehensive Plan - Table 2 'Analysis of Existing Zoning Districts', Richmond, RI.

The preceding information also acknowledges the great dependency on residential property taxes as the primary fiscal resource, a dependency that is economically untenable. This fact is further corroborated by the vastly depleted 'true' fiscal generating resources, namely those dedicated to commercial and/or industrial entities. Pursuant to the Comprehensive Plan, less than five-percent (4.86%) of the town's land resources are dedicated to such usage. Furthermore, given vast town-wide development constraints and almost non-existent public infrastructure, ability to accommodate additional resources is limited. Therefore, any opportunity in which residential development may be displaced by a fiscal generating entity that necessitates almost no infrastructural improvements and has minimal long-term impact on the land itself, should be well-supported.

"***...Richmond has a limited public water district and no sewers. See also Public Services and Facilities Element. The Taintor Report cautions against large-scale economic development projects and urges careful examination of all construction and maintenance impacts, water availability, wastewater disposal, and infrastructure maintenance issues***." [Page 48]

Water Availability and Need - "*Private wells serve most residents and business. Property developers are responsible for making sure there are sufficient water sources to support a development project. This includes meeting fire suppression requirements, potable drinking water standards and RIDEM approval for OWTS (Onsite Wastewater Treatment Systems) ...*" [Page 67]

Wastewater - "*Richmond has no public wastewater collection or disposal system; therefore, all residences in Richmond are served by Onsite Wastewater Treatment Systems or older septic systems. Disposal of wastewater through inadequately maintained or failing on-site disposal systems can adversely affect the Town's drinking water supply.*" [Page 68]

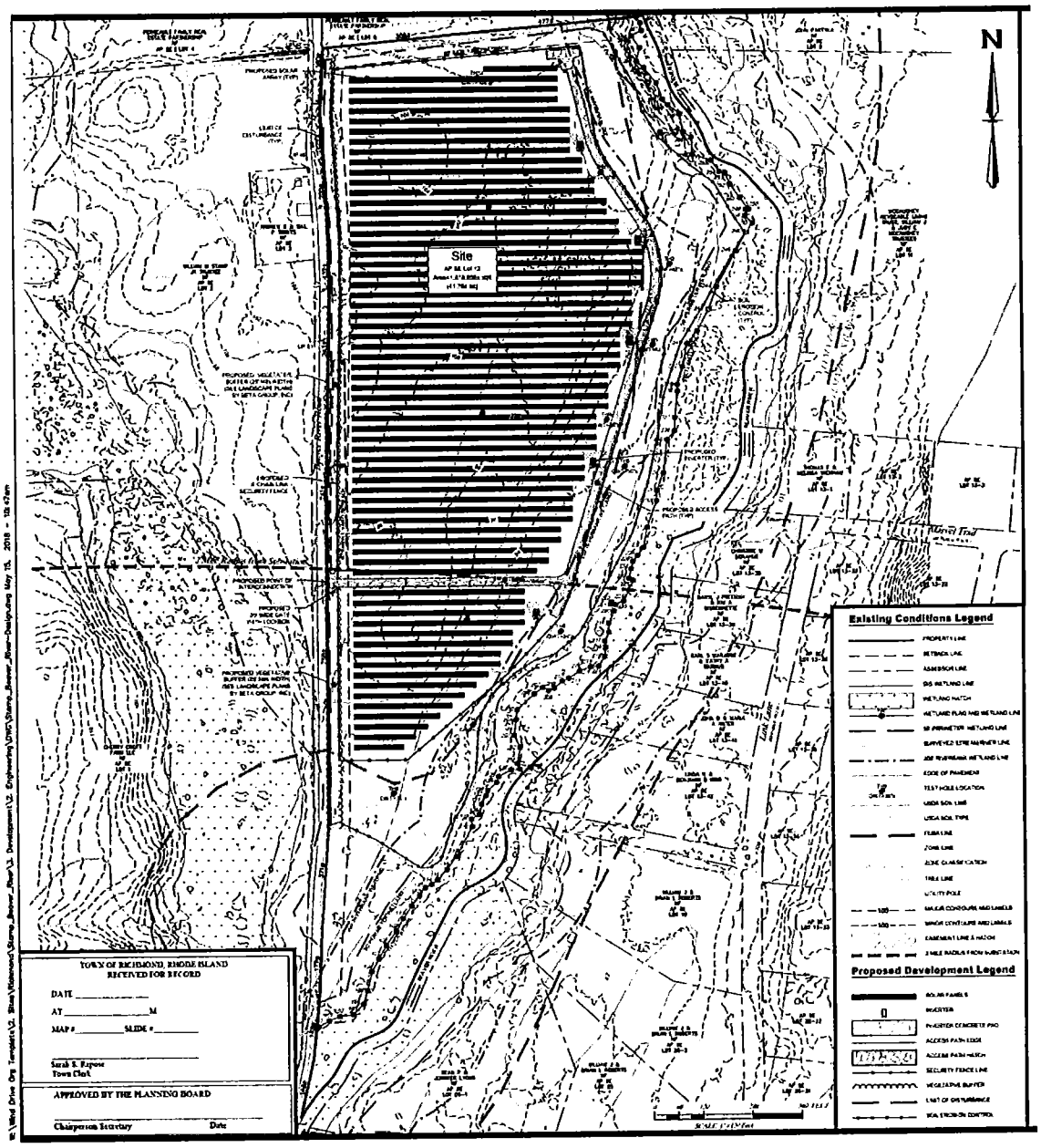
Goal PSF 1: "*Provide residents with public services that are consistent with the Town's need and financial ability.*" [Page 71]

Policy PSF 3: "***Balance new development proposals with available water supply and locate employment, residential, and recreation sites to minimize the necessity of infrastructure improvements (See Land Use Element)***."

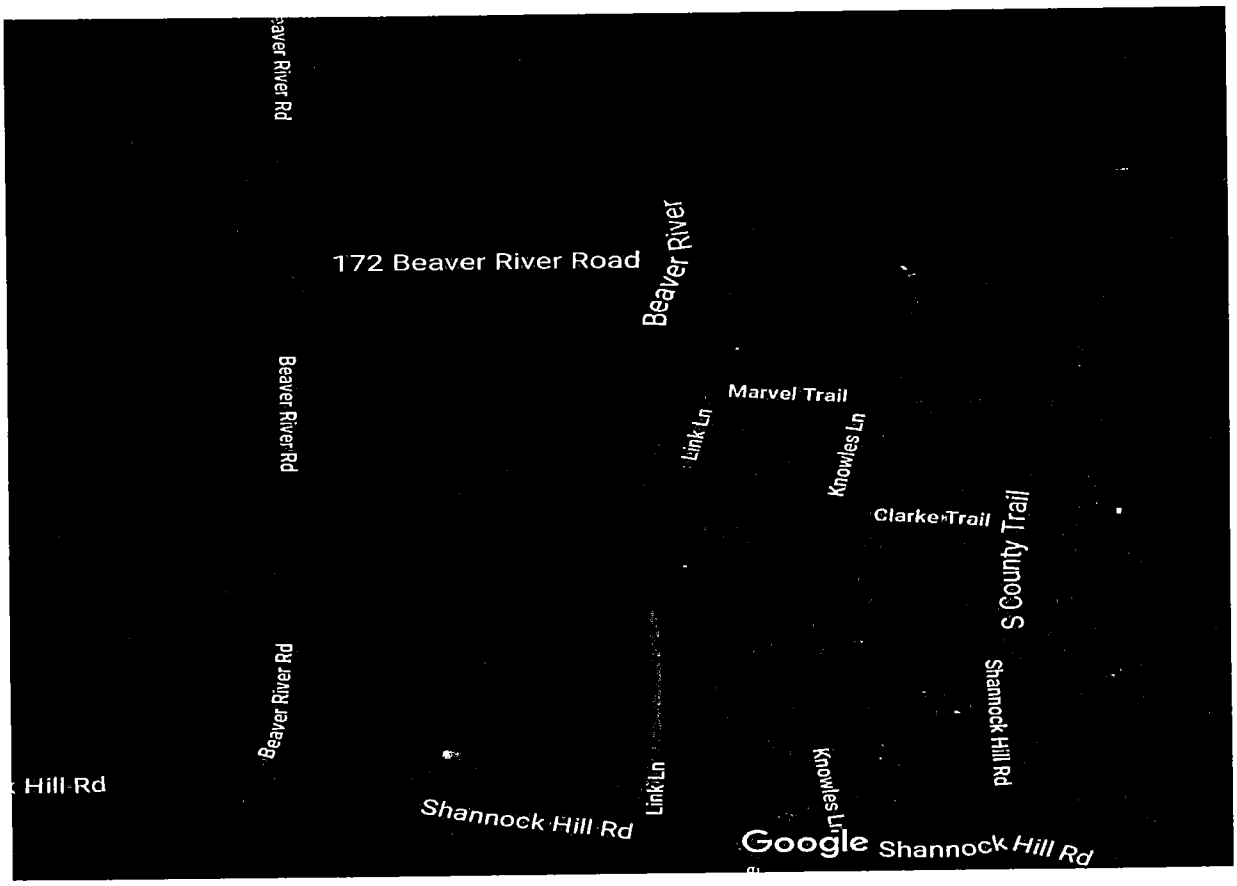
Considering that the Town has no public wastewater disposal system and only very limited public drinking water, and therefore all development must secure such resources privately (i.e., OWTS and Wells), most types of development are not only potentially environmentally detrimental, but will also consume precious resources. They can also be quite costly, particularly in regard to residential development, which necessitates mandatory educational services. Regulatory measures are but a singular manner of control; appropriate reuse being another viable method. As previously noted, the surrounding neighborhood is sparsely improved, the sole residential presence being situated opposite the riverbank. This reflects existing Property and regulatory 'low-density' development conditions. The illustration on the following page (excerpted from Google Earth) exemplifies this point.

GENERAL SES DEVELOPMENT PROPOSAL

The applicant seeks to introduce a 'conditionally permissible' SES Development, in accordance with the 'Table of Use Regulations', of the Ordinance. The proposed SES development will be primarily situated throughout the north-westerly portion of the property, and extending in a southerly direction, directly aligned with Beaver River Road. Although, the total Limit of Disturbance (LOD) will effect upwards of approximately 31-acres, actual acreage dedicated to the solar installation proper is somewhat less. The total proposed 'Fenced-In Solar Array' operational area is approximately 24-acres (or 57%). The most notable fact is the limited quantity of tree disturbance, given the presence of already vast, non-forested fields. Another equally important point is the fact that agricultural resources are not negatively impacted, because all topsoil is maintained on-site and land resources are not permanently disturbed, as would be the case were the property improved for a by-right land usage, such as a residential development. Therefore, the property is in fact 'land-banked,' permitting a variety of future land uses, to include agriculture.



The proposed SES Development is illustrated below, as excerpted from the GREEN Development, LLC - Site Plan Package. To reiterate, there are only a handful of proximate residences, the vast majority located opposite, or east of the Beaver River. Considering the riverbank is already vastly protected by mature vegetation (serving as both natural screening and buffering), it is the professional opinion of this land use consultant that there will be limited, if any, solar array field line-of-sight intrusion. The nearest residence, at its closest point, will be approximately 500-feet. Otherwise, residences are situated between 600 and 800-feet distance, from the nearest array. Furthermore, given the overall minimized height of the proposed solar panel array (maximum 12-feet in overall height), and applicant's proposal to



minimize visual intrusion through a combination of fencing and enhanced vegetation (as evidenced by the submitted landscaping plan), it is difficult to comprehend how any possible visual, or other negative impact, could possibly result. The proposed SES Development, unlike other 'permissible' land uses, such as a residential subdivision, will occupy the property for some period of time, but is not permanent. The SES Development is therefore quite appropriate given its placement, limited disturbance, and realizing a defined period of operation. Secondarily, unlike a typical permanent permissible residential subdivision, either simultaneous or future farming / agricultural activity is still plausible. Regardless, as evidenced by the engineered plans, 'No Prime Agricultural Soils' will be permanently disturbed, either during construction or subsequent operation. Therefore, reuse for alternative solar energy purposes, is directly in accord with the Comprehensive Plan. The subject SES Development will avert visual intrusion and permanent disturbances that would otherwise result from a by-right residential development, while protecting the rural landscape deemed so imperative throughout the Comprehensive Plan.

Introduction - 2012 Richmond Comprehensive Community Plan - "*Richmond is a rural town, part of Washington County in southern Rhode Island, approximately 15,190 acres or 23.7 square miles.* ***It has historically been a farming and forestry community with small mill villages along its water ways. Today, residents value its open spaces and natural features.*** *They choose to live here because of its small-town feel and quiet streets. Its abundant natural areas, historic villages, scenic views and vistas of forests, fields and farms, and active agricultural businesses define Richmond's rural character.* ***Residents envision Richmond as a community that balances the protection of its rural characteristics while encouraging development that builds its tax base***." [Page 1]

Conservation and Protection - "***Preservation of Richmond's rural character is the most consistently mentioned local priority in recent and past community surveys****. In spite of suburban housing development over the past two decades, Richmond remains primarily rural and heavily wooded, and community life is still somewhat focused around the villages and schools, especially the centralized village of Wyoming.*" [Page 28]

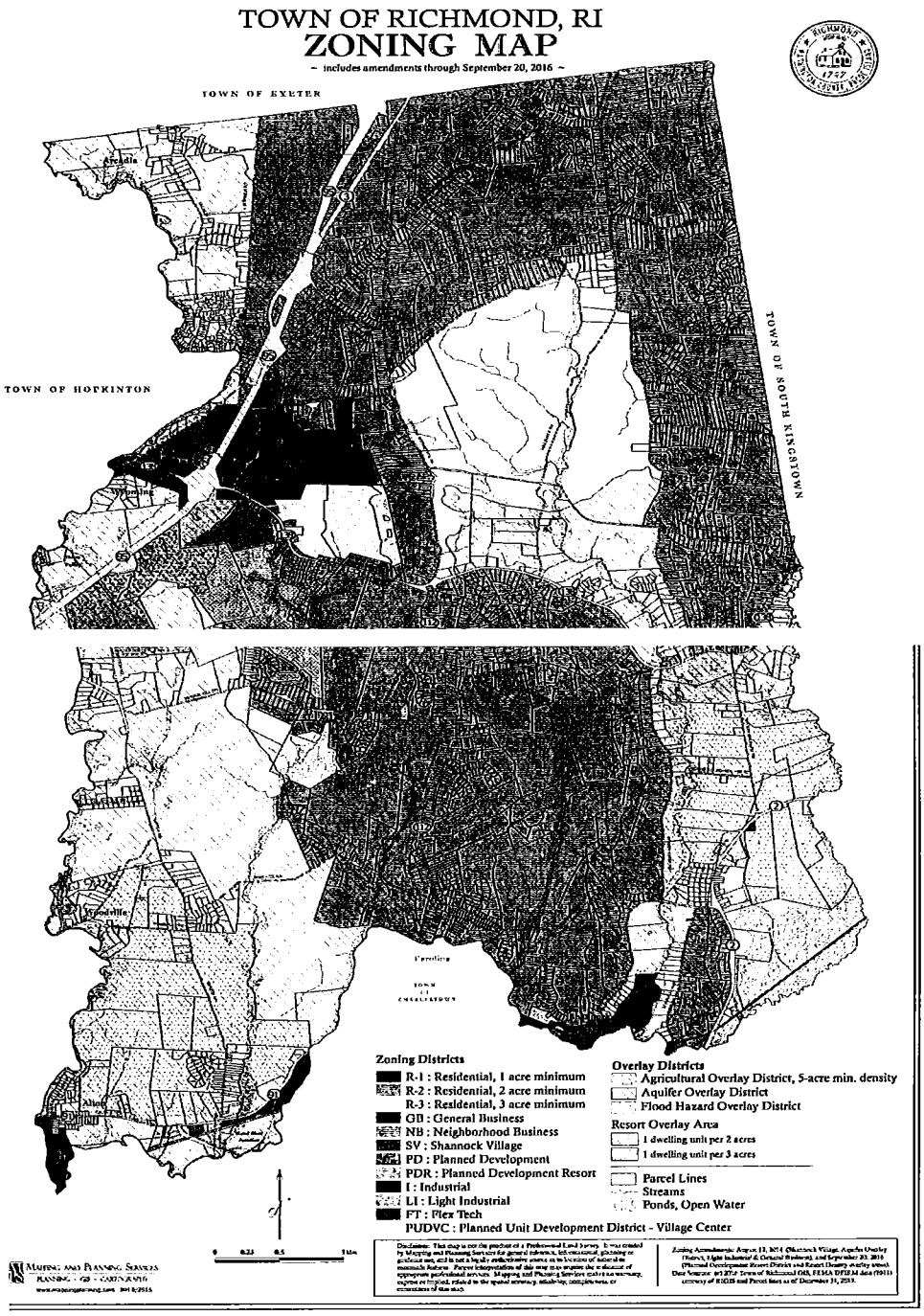
Policy NC9: "*Promote conservation of Richmond's natural features and its traditional rural character (See Land Use Element).*" [Page 37]

GENERAL REGULATORY 'ENERGY' COMPLIANCE

The referenced community regulatory approach, namely 'conditionally permitting' introduction of a solar installation in the lower-density R-3 District, reflects typical zoning methodology. Although solar energy, unlike other sources of renewable energy, are rather innocuous and practically concealed given their extremely low installation profile, they nevertheless require a reasonable quantity of land area to realize an economically productive proposal. The lower-density 'residential' zoning designations are typically imposed upon the larger acreage, more rural portions of a community - areas in which solar energy installations are most appropriate. Therefore, it is more likely, than not, that any reasonable land use will be located in a low-density residential district. The below illustration, excerpted from the Comprehensive Plan, clearly denotes this point. The lower-density districts basically encompass the entire community.

Standard 9.2.b - "*Include implementation actions within the Implementation Program that address: Adopting zoning policies and siting standards for renewable energy production facilities.*" [Energy Guidance Handbook - Pages 9 - 10]

"*When considering which actions may be appropriate for your municipality, consider the following guiding questions*:



o "***<u>What are the general lot sizes for the municipality's zoning districts and what types of renewable energy production facilities may be appropriate for lots of that size</u>?***"

o "*What siting standards should the municipality place on renewable energy production facilities to minimize impacts to surrounding properties?*"

"*...The state budget crisis, **increased energy costs**, and the housing market and credit collapse pushed Rhode Island into a recession nearly one year ahead of the rest of the nation...*" [Comprehensive Plan - Page 40]

Comprehensive Plan - Goals, Policies, and Actions [Pages 49 - 50]

Goal ED 1: "*Promote economic activities that enhance and support the rural character and natural environment of Richmond.*" [Page 49]

Policy ED 1: "*Advocate for business models and types which complement the Town's rural character.*"

Action ED 1: "*Identify the types of enterprises and industries that will be needed to serve the town's current and future population.*"

Policy ED 5: "*Maximize the supply and choice of land capable of supporting business and industries.*" [Page 50]

Action ED 6: "*Review current land development controls and recommend amendments that will complement the economic development goals.*"

The State of Rhode Island has downward directed provision of renewable energy to all communities - rendering it a mandatory requirement that all municipalities, via their Comprehensive Plans, address individual needs and providing the necessary guidance on how both local and state-wide needs can be achieved. It is well-recognized that it is the responsibility of all municipalities to assist in developing a comprehensive energy program., as evidenced by the following Rhode Island General Law:

§ 45-22.2-6 Required content of a comprehensive plan.

(b) "*The comprehensive plan must be internally consistent in its policies, forecasts, and standards, and shall include the content described within this section. The content described in subdivisions (1) through (10) may be organized and presented as deemed suitable and appropriate by the municipality. The content described in subdivisions (11) and (12) must be included as individual sections of the plan.*"

(8) Services and facilities. "*The plan must be based on an inventory of existing physical infrastructure such as, but not limited to, educational facilities, public safety facilities, libraries, indoor recreation facilities, and community centers. The plan must describe services provided to the community such as, but not limited to, water supply and the management of wastewater, storm water, and solid waste. **The plan must consider energy production and consumption.** The plan must analyze the needs for future types and levels of services and facilities, including, in accordance with § 46-15.3-5.1, water supply system management planning, which includes demand management goals as well as plans for water conservation and efficient use of water concerning any water supplier providing service in the municipality, and contain goals, policies, and implementation techniques for meeting future demands.*"

2012 Richmond Comprehensive Community Plan - "*Richmond is a rural town, part of Washington County in southern Rhode Island, approximately 15,190 acres or 23.7 square miles.* ***It has historically been a farming and forestry community with small mill villages along its water ways. Today, residents value its open spaces and natural features.*** *They choose to live here because of its small-town feel and quiet streets. Its abundant natural areas, historic villages, scenic views and vistas of forests, fields and farms, and active agricultural businesses define Richmond's rural character.* ***Residents envision Richmond as a community that balances the protection of its rural characteristics while encouraging development that builds its tax base***." [Page 1]

Consistency with State Plans - "*The Richmond Comprehensive Community Plan must be consistent with the State Guide Plan, as amended, which encompasses many of the elements required in the Comprehensive Community Plan. State Guide Plans and other state plans referenced in this document are:*" [Page 2]

- "*Land Use 2025 (State Guide Plan Element 121).*"
- "*Economic Development Strategy (State Guide Plan Element 211).*"

The Town of Richmond Comprehensive Plan is now five-years old, and does not address energy production to the extent envisioned and regulated by state law. Regardless, general consistency can nevertheless be evidenced, considering solar installations do not require those public resources so greatly necessitated by otherwise by-right land uses, such as residential development. Furthermore, given the regulatory nexus between the Comprehensive Plan and the Ordinance, and the fact that solar energy systems are deemed 'conditionally permissible' land uses within the R-3 District, 'consistency' is absolutely affirmed.

The Richmond Town Council amended the zoning regulations as recently as 2017 to address the appropriateness and placement of 'solar energy systems'. The referenced amendment(s) clearly acknowledges that they are absolutely appropriate in the R-3 District, deeming them 'conditionally permissible' land uses. As a precursor to this legislative discussion and approval, and as required by RIGL 45-24-51 and 45-24-52, as well as the Ordinance itself, the Planning Board would have been requested to review said amendment(s) and provide, after careful study, its 'Findings.' These 'Findings', would have included a determination as to consistency with the Comprehensive Plan. It is therefore logical to conclude that the Planning Board deliberated the appropriateness of 'Solar Energy Systems', and more specifically their appropriateness within the R-3 District, and proffered an affirmative recommendation on 'consistency.'

RIGL § 45-24-51. Adoption – Procedure for adoption or amendment: "*The city or town shall designate the officer or agency to receive a proposal for adoption, amendment, or repeal of a zoning ordinance or zoning map(s). Immediately upon receipt of the proposal, the officer or agency shall refer the proposal to the city or town council, and to the planning board or commission of the city or town for study and recommendation. The planning board or commission shall, in turn, notify and seek the advice of the city or town planning department, if any, and report to the city or town council within forty-five (45) days after receipt of the proposal, giving its findings and recommendations as prescribed in § 45-24-52. Where a proposal for adoption, amendment, or repeal of a zoning ordinance or zoning map is made by the city or town planning board or commission, the requirements for study by the board may be waived; provided, that the proposal by the planning board includes its findings and recommendations pursuant to § 45-24-52. The city or town council shall hold a public hearing within sixty-five (65) days of receipt of a proposal, giving proper notice as prescribed in § 45-24-53. The city or town council shall render a decision on any proposal within forty-five (45) days after the date of completion of the public hearing. The provisions of this section pertaining to deadlines shall not be construed to apply to any extension consented to by an applicant.*"

RIGL § 45-24-52. Adoption – Review by planning board or commission: "*Among its findings and recommendations to the city or town council with respect to a proposal for adoption, amendment, or repeal of a zoning ordinance or zoning map, the planning board or commission shall:*"

(1) "***Include a statement on the general consistency of the proposal with the comprehensive plan of the city or town, including the goals and policies statement, the implementation program, and all other applicable elements of the comprehensive plan***."

(2) "*Include a demonstration of recognition and consideration of each of the applicable purposes of zoning, as presented in § 45-24-30.*"

GENERAL COMPREHENSIVE PLAN CONSISTENCY ANALYSIS

Albeit, the Comprehensive Plan does not 'expressly' address (in detail) renewable energy production (refer above), it can be generally concluded that the Community's desire is to protect the rural character and regulate development based upon presence of infrastructure (or lack thereof). Regulating development likewise entails consideration of such limiting factors as wetlands, cultural and historical resources, scenic corridors, etc. Comprehensive Plan composition is regulated by the various State Guide Plan(s) and other regulatory documents, approved by the State Planning Council. The State Guide Plan in question would be the State Energy Plan. The overall goal of the State Energy Plan is to realize provision of cleaner, more efficient energy, to meet the need of residents and business community alike.

Therefore, the statewide directive, downward directed to the individual municipalities, is to carefully consider all energy proposals, introducing regulatory standards as required. This includes all renewables, such as wind, solar, and hydro, as well as more efficient non-renewables given the understanding that an effective statewide energy program must be dependent upon and inclusive of a variety of sources.

Energy Guidance Handbook

Standard 9.2.B - "*Include implementation actions within the Implementation Program that address:*" [Pages 9 - 10]

"***Adopting zoning policies and siting standards for renewable energy production facilities***."

"***It is important that local zoning ordinances address renewable energy production facilities.*** *To provide clarity to the development process, zoning ordinances must include identification of which types of renewable energy production facilities will be allowed within the municipality, whether it be within specific zoning districts, or for the municipality as a whole. Additionally, when appropriate, zoning ordinances may include siting standards for allowed renewable energy production facilities in order to dictate the placement and size of the facilities within a property.*"

"***The main renewable energy production facility types that municipalities are likely to encounter are solar*** *and wind, and, to a lesser extent, hydropower and anaerobic digestion. Municipal ordinances should consider all of the various types of renewable energy production facilities, in which districts they may be appropriate and what dimensional constraints might be reasonable.*"

RECOMMENDATION 9.4 - "*Include implementation actions within the Implementation Program that address: Enabling the development of renewable energy production facilities by the private sector.*" [Page 14]

Further general Comprehensive Plan 'consistency,' specifically as it pertains to the appropriateness of siting of solar energy systems versus otherwise by-right land uses, can be evidenced by the following excerpted Comprehensive Plan language.

"*Respondents to the survey were also asked to list the greatest challenges facing the Town. Many cited the need for economic development and* ***supporting new businesses in town while maintaining Richmond's rural character. Keeping taxes low was also another response***." [Page 4]

"*Having estimated the potential increase of Richmond's population, work force size and housing needs, the Town is concerned with the spatial distribution of land uses.* ***Sites for future employment, housing, and recreation will depend, in part, on development suitability and water availability. In other words, what areas of Richmond are able to accommodate a growing population without impairing natural and cultural resources****? As discussed in the Land Use and Economic Development Elements of this plan, future commercial development will be concentrated in villages with availability of existing public services (drinking water), such as in Wyoming, the vicinity of the I-95 Exit 3 corridor, as well as a new growth center at Routes 138 and 112. By concentrating commercial development in these areas, there will be less pressure to develop other areas of natural and cultural resources. See the Land Use Element for more details on future development in Richmond.*" [Page 24]

Policy NC4: "*While protecting the Town's natural resources, encourage their use in a sustainable and environmentally sensitive way that promotes economic development opportunities.*" [Page 35]

Action NC5: "*Develop economic strategies that promote the sustainable use of the Town's abundant local and state parks and other open spaces. Strategies should support local businesses catering to users (See Economic Development Element).*"

Policy NC6: "*Identify and maintain scenic rural landscapes, vistas, and key cultural and historic resources.*" [Page 36]

Action NC15: "*Concentrate major developments and community facilities within and adjacent to established villages and town-designated growth areas to alleviate pressure to develop the more rural areas of town (See Land Use Element).*"

Goal H1: "*Provide residents of Richmond with adequate, safe, and affordable housing opportunities, while protecting the natural environment and town character residents value most.*" [Page 95]

Policy H1: "*Encourage a rate of residential development that meets housing needs, is within the capacity of the natural environment, and can be sustained by existing services within the town.*"

Action H1: "*Assess impact fees for schools, affordable housing trust fund, and open space/recreation for all new market-rate dwelling units.*"

Managing Growth and Maintaining Rural Character - "*Growth and certain land use patterns can strain local resources, including schools, water quality and supply, roadway maintenance and emergency services…*" [Page 109]

"*…The best policy is to encourage land development which increases tax revenue but makes* minimal demands on costly town services. There are several strategies Richmond can pursue:"

• "*Encourage non-residential development: Commercial and industrial businesses increase the local tax base and add local jobs to the region. The Town needs to support growth and expansion of existing businesses and develop approaches to attract new businesses (See Economic Development Element).*"

CONDITIONALLY PERMISSIBLE LAND USE

Similar to the evidenced Comprehensive Plan 'consistency,' the same is true of the community's zoning regulations. This can be evidenced by a combination of the legitimacy of locating solar energy in the R-3 District, as quantified by the Ordinance, and general neighborhood appropriateness afforded by the Comprehensive Plan. As already documented, the Town of Richmond has already identified 'Solar Energy Systems' entities as being appropriately permissible land uses in the R-3 District, pursuant to the granting of an SUP. A land use permitted by SUP, pursuant to both the state enabling legislation and case law, is a conditionally permitted land use. In other words, a land use that is in fact permissible, subject to reasonable conditions of approval, if necessary. This land use consultant can only surmise that such a determination must be in part on the Town's (Council and Board alike) understanding of the importance of alternative energy production and its proper placement. Being 'conditionally permissible' means that the referenced land use is in fact 'permissible' in the respective district. The sole issue to be satisfied, is whether the subject locale is appropriate in light of the Comprehensive Plan - Goals and Objectives, and Ordinance - Standards for the granting of the SUP. This conclusion is not opinion, but founded in case law, specifically Nani v. Zoning Board of Review, 104 R.I. 150, 242 A.2d 403. General Comprehensive Plan consistency has already been evidenced. Th final step is affirming regulatory compliance. Regulatory compliance includes addressing requisite standards for the granting of the DPR and SUP,

REGULATORY CONSISTENCY ANALYSIS

This section will first address the requisite 'standards' for the granting of the Development Plan Review, followed by those specifically applicable to the introduction of 'solar energy systems', and finally the general standards applicable to the granting of the Special Use Permit.

Section 18.54.100 'Development Standards' - "*The planning board shall review development plans for conformity with the following development standards:*"

A. General considerations.

1. "*The plan shall show compatibility with and protection of adjacent uses, and shall mitigate impacts on municipal services and facilities, including the public street system, police services, and open spaces. The planning board shall have the authority to controlling the sequence of development when it is necessary to protect the public health or safety.*"

The proposed SES Development will not result in any negative neighborhood impact, given limited residential presence (opposite the Beaver River and screened by mature naturally protected vegetation), and ability to mitigate any unobstructed visual corridors through enhanced landscaping improvements. The distinctive difference between an SES and a by-right residential development, is the need for costly municipal services. An SES requires none, whereas the residential development requires them all, most notably educational services.

B. Site design.

1. "*The plan shall relate to the natural terrain and be visually compatible with the community and with nearby uses. Environmentally sensitive areas, scenic vistas, historical sites, historically significant structures, and specimen vegetation should be protected and preserved.*"

SES installations always comport with the natural terrain, not requiring any disturbance in topography, as may result from a permanent residential development. They are also temporary in nature (land-banking) and maintain the natural resources (e.g. on-site topsoil), thereby permitting unlimited reuse, inclusive of agriculture.

2. "*Existing site features such as stone walls, cemeteries, and ledge faces shall be preserved wherever possible. Existing buildings of character should be reused whenever possible. Walkways, greenways, travel lanes, parking areas and driveways should be connected with similar facilities on adjacent property whenever possible. The planning board shall have the authority to require pedestrian walkways or easements for future pedestrian walkways to connect buildings within the site to adjacent sites.*"

Not applicable. No such features exist, nor are any of the referenced improvements necessary.

3. "*The plan should conform to sections 13.3 (commercial and industrial site design) and 13.14 (utilities) of the land development and subdivision regulations to the extent the regulations are applicable to the particular development plan under review.*"

Once again, not applicable. Although, not specifically referenced in the subject standard, all on-site interconnection will be underground as mandated by regulation.

C. Building design and location.

1. "*Proposed structures should relate harmoniously to the terrain and to the existing buildings in the vicinity. Building location, bulk, height, scale, style, form, size, color, and materials should be compatible with the character of the area. Corporate or franchise styles are not acceptable.*"

Once again, not applicable. No permanent physical buildings are proposed. The location, height, massing and scale of proposed solar arrays, is such that it limits both physical and visual neighborhood intrusion. This is further corroborated by the proposed enhanced landscaping improvements.

2. New buildings should use traditional pitched roof forms that are compatible with the character of the town.

3. "*Natural materials such as stone, brick, wood, and slate are preferable to materials such as exposed concrete blocks, anodized or galvanized metals, tinted glass, plastics, and vinyl.*"

4. "*Rooftop equipment such as plumbing vents, ducts and roof-top mechanical equipment shall be screened from view. Dumpsters and other solid waste storage shall be located within a permanently screened and landscaped enclosure.*"

The preceding three (3) standards are not applicable.

5. "*Signs shall conform to the provisions of Chapter 18.24 of this title.*"

Typical advertising signage is neither required, nor will be introduced. The only signage, if necessary, is that which may be mandated by law for cautionary purposes (emergency oriented signage).

Landscaping.

1. "*The planning board may require vegetative or other buffers between lots or land uses sufficient to ameliorate the effects of dirt, litter, noise, odor, illumination, or parking areas on adjacent properties or uses.*"

The applicant has proposed an extensive landscaping plan to mitigate visual corridor intrusion. The applicant is prepared to be cooperative in further vegetative enhancements, should they be both reasonable and necessary.

2. "*At least ten percent of all non-residential front yards shall be using evergreen or deciduous trees at least three inches in caliper and eight feet in height, evergreen and deciduous shrubs that are one to three feet in height, and a continuous living ground cover.*"

Full compliance is affirmed.

3. "*The plan should conform to sections 13.7.4 (street trees), 13.8 (landscaping), 13.12 (stormwater management systems), 13.15 (soil erosion and sediment control), and 13.17 (flood hazard areas) of the land development and subdivision regulations to the extent the regulations are applicable to the particular development plan under review. Lighting shall comply with International Dark Sky Association standards as required in section 13.8.2 of the land development and subdivision regulations.*"

Lighting is not an issue, none required. As for typical developmental design requirements, such as drainage, soil erosion control, etc., these will all meet regulatory and engineering standards, as will be evidenced by the respective expert.

Parking and traffic circulation.

1. "*The plan shall provide for adequate and safe parking areas, loading areas, and traffic circulation, including separation of pedestrian and vehicular traffic, and accessibility by emergency vehicles.*"

Other than during construction, when any true activity will be on-going for a limited specified period, the proposed land usage neither necessitates off-street parking nor physical pedestrian separation. There will be sufficient maneuvering capability provided throughout the site for emergency vehicles, albeit the proposed land usage is virtually free of any such concerns.

2. "*Parking shall be located on the side or rear of buildings except where physical site constraints make such a location impossible.*"

Not applicable.

3. "*On corner lots, the principal point of access shall be from the secondary street.*"

Not applicable.

4. "*Proposed and existing driveways shall be located at least fifty (50) feet apart unless the length of the lot frontage makes such a distance impossible.*"

Singular access point proposed with locked gate for security purposes, as mandated by regulation. Emergency accessibility is provided on a 24-hour basis.

5. "*Each lot shall have no more than two driveways entering and exiting to a street. The planning board shall have the authority to require combined driveways or access between adjoining parking lots to minimize the number of access points to public streets.*"

Singular access point proposed with locked gate for security purposes, as mandated by regulation. Emergency accessibility is provided on a 24-hour basis.

6. "*The plan shall conform to Chapter 18.29 of this Title.*"

Once again, there will be a singular access point proposed with locked gate for security purposes, as mandated by regulation. Emergency accessibility is provided on a 24-hour basis. There will be appropriate pervious access throughout, access that is sufficient to accommodate emergency vehicles. Regardless, limited off-street parking is necessary and traffic volumes almost nil.

7. "*The plan shall conform to sections 13.5 (street dimensions and design), 13.7.3 (pedestrian walkways), 14.1 (construction specifications), and 14.5 (pedestrian walkways adjacent to streets) of the land development and subdivision regulations to the extent the provisions are applicable to the particular development plan under review.*"

Not applicable.

8. "*Impervious parking areas, including gravel and paved, must comply with the standards of the most recent edition of the Rhode Island Stormwater Design and Installation Standards Manual adopted by the R. I. Department of Environmental Management and the Coastal Resources Management Council, December 2010.*"

Parking areas are not required, and will therefore not be introduced. Access-ways will be maintained in a pervious state throughout. Regardless, all state and local regulatory standards will be fully complied with.

Section 18.34.010 'General requirements' - "*A. For the purposes of this Chapter, a solar energy system consists of a ground-mounted solar panel array and its associated structures and components. The requirements of this Chapter apply to all solar energy systems that are principal uses.*"

B. "*The following requirements apply to solar energy systems in all zoning districts.*"

1. "*All electrical connection and distribution lines within a solar energy system shall be underground. Electrical equipment between the system and the utility connection may be above ground if required by the utility.*"

Full compliance is affirmed.

2. "*To prevent unauthorized access, the solar energy system shall be enclosed by a security fence at least six (6) feet high. The security fence may be located in a required yard.*"

Full compliance is affirmed. To be installed with emergency locked gate at entrance.

3. "*Exterior lighting within the solar energy system shall be the minimum necessary. All fixtures shall be full-cutoff fixtures approved by the International Dark Sky Association.*"

Lighting is not an issue, none required.

4. "*The maximum height of the panels shall be twelve (12) feet, as measured from the average post-construction grade at the base of the structure.*"

Full compliance is affirmed. Will not exceed 12-feet.

5. "*If the solar energy system is the only principal use on the property, the maximum lot coverage in Sec. 18.20.010 shall not apply.*"

SES Development will be the sole principal usage of the subject property.

6. "*An application for development plan review or for a special use permit shall include:*"

a) "*Written confirmation from the utility that the owner has received preliminary approval to connect the solar energy system to a utility line.*"

Full compliance is affirmed.

b) "*The proposed site layout, a diagram of electrical components, a description of the major system components to be used, and a proposed operation and maintenance plan.*"

Either already prepared or will be prepared. Full compliance is affirmed.

7. "*No topsoil or prime agricultural soil, as defined in Chapter 18.08, shall be removed from the site for installation of the facility.*"

All topsoil will be maintained on-site.

Section 18.34.030 'Requirements for a special permit use' - "*The following requirements shall apply to a solar energy system that is allowed by special use permit in the zoning district.*"

A. "*The entire lot on which the solar energy system is located shall be within two (2) miles of a utility substation.*"

Affirmed, less than two (2) miles.

B. "*The security fence shall be located 25-feet from the perimeter of the solar energy system.*"

Affirmed, will not be situated any no closer than the requisite 25-feet.

C. "*The minimum front, side and rear yards required in the zoning district by Sec. 18.20.010 shall not apply. The front, side and rear yards shall be at least fifty (50) feet, measured from the property line to the perimeter of the solar energy system.*"

Affirmed, will be at least 50-feet. In certain instances, will even exceed said 50-feet.

D. "*A vegetative buffer at least twenty-five (25) feet wide shall be maintained between the security fence and the boundaries of the lot. The zoning board of review shall have the authority to require a wider vegetative buffer if there is sufficient competent evidence in the record to support the increase.*"

The applicant has proposed an extensive landscaping plan to mitigate visual corridor intrusion. The applicant is prepared to be cooperative in further vegetative enhancements, should they be both reasonable and necessary.

E. "*The lot or parcel must be large enough to accommodate a solar energy system that covers at least eleven (11) contiguous acres that are not within the jurisdictional boundaries of a wetland, as that phrase is defined in the current R.I. department of environmental management rules and regulations governing the administration and enforcement of the freshwater wetlands act.*"

Far exceeds the minimum 11-acre regulatory requirement, all of which are outside the jurisdictional wetlands boundary.

F. "*A solar energy system shall not be located on a lot that is protected from development by a conservation easement, preservation easement, or deed restriction, or on a lot or portion of a lot that is classified by the tax assessor as farm land, forest land, or open space land pursuant to title 44, chapter 27 of the general laws.*"

Other than the farm, forest and open space classification, no regulatory impediments presents exist. As for the referenced classification, will be entirely removed prior to construction.

Section 18.52.060 'Special Use Permits' - "*The zoning board of review shall have the authority to grant special use permits that are specifically authorized by this Title.*"

A. "*An applicant for a special use permit must demonstrate to the satisfaction of the zoning board of review that:*"

1. "*The proposed use will not substantially or permanently harm the appropriate use of surrounding property.*"

The proposed SES Development will not result in any negative neighborhood impact, given limited residential presence (opposite the Beaver River and screened by mature naturally protected vegetation), and ability to mitigate any unobstructed visual corridors through enhanced landscaping improvements. The distinctive difference between an SES and a by-right residential development, is the need for costly municipal services. An SES requires none, whereas the residential development requires them all, most notably educational services.

2. "*Neither the proposed use nor its location on the site will result in conditions that will harm the public health, safety, and welfare.*"

The proposed SES Development requires almost no infrastructure, the kind necessitated by a by-right residential development. In fact, on-site conditions will be maintained, such as preservation of all topsoil. It is the least disturbing, most protective usage of a property,

considering it is a temporary 'land-banked' use that when eventually dismantled permits unlimited reuse.

3. "*The proposed use will be in harmony with the general purpose and intent of this Title.*"

The SES Development is not only generally consistent with the Comprehensive Plan, but furthers the Intent and Purposes of the Ordinance, because it will not realize any neighborhood impact, while introducing efficient, clean renewable energy.

CONCLUSION

It is the professional opinion of this land use planning consultant that the subject request to introduce an SES Development amidst the subject property, and general Beaver River Road neighborhood, will be consistent with the goals and objectives of the Comprehensive Plan and State Energy Plan, and therefore appropriate for the granting of both the DPR and SUP. My professional opinion is based upon the manner in which the proposed system can be well incorporated into the overall fabric of the surrounding neighborhood - a non-intrusive land use that will be almost invisible, while providing clean efficient and less costly energy, and realizing another much-needed revenue stream.

PIMENTEL CONSULTING, INC.
Edward Pimentel, AICP
26 Avon Road
Cranston, Rhode Island 02905

(401) 529-0647 – Cellular
Tax ID No. 56-2331684
on-line: edaicp@yahoo.com

SUMMARY of QUALIFICATIONS

Forward-thinking, pragmatic urban planning professional with twenty (20+) years of practical experience. Skilled in a variety of neighborhood and commercial planning and zoning activities, frequently in a supervisory or managerial capacity. Solid track records with proven effectiveness in, but not limited to, the following areas:

⇒ **Zoning Boards of Review** ⇒ **Community Planning and Consulting**

⇒ **Planning Boards / Commissions** ⇒ **Subdivision Review and Planning**

⇒ **City / Town Councils** ⇒ **Superior Court** ⇒ **Code Enforcement**

⇒ **Residential, Commercial and Industrial Development**

SELECTED EXAMPLES of ACCOMPLISHMENT

- Testified before numerous boards, commissions and councils on matters of residential, commercial, and industrial development, as well as changes / amendments to Zoning Ordinances and Comprehensive Plans.

- Testified before Municipal and Superior Court on matters of code enforcement and general land use planning.

- Authored various documents including Cost of Community Services Study, Revitalization Plans, Zoning Ordinances, Comprehensive Plan Amendments and the first Telecommunications Ordinance in the State of Rhode Island.

- Responsible for reviewing all development associated with the Quonset Point / Davisville Industrial Park, an approximately 3,500 acre industrial park, site of the former Sea Bee Navy Base, numerous mill rehabilitation projects, including Pocasset Mill, Johnston, RI (Comprehensive Plan Amendments).

- Responsible for reviewing numerous residential subdivisions, especially expert in the field of Comprehensive Permits (Affordable Housing). Work product cited by the Rhode Island Supreme Court.

- Represented clients before numerous Zoning Boards of Review throughout the State of Rhode Island, on a variety of variance and special use permit petitions, with a greater than 90% success rate.

- Extensive energy and renewable energy projects, including solar, wind and gas-fired eccentric generating assets.

EDUCATION

MASTERS OF COMMUNITY PLANNING AND DEVELOPMENT
University of Rhode Island - Masters Received 1994

University of Florida - Studied City Planning - 1991 / 1992

BACHELOR OF ARTS – URBAN AFFAIRS; MINORS IN MATHEMATICS AND PHILOSOPHY
University of Rhode Island - BA Received 1990

ACCREDITATION: AMERICAN INSTITUTE of CERTIFIED PLANNERS – May 1996

PROFESSIONAL EXPERIENCE

Land Use Consultant — PIMENTEL CONSULTING, INC.
East Providence, Rhode Island

Zoning Officer — CITY OF EAST PROVIDENCE
East Providence, Rhode Island

Consulting Town Planner — TOWN OF BARRINGTON
Barrington, Rhode Island

Town Planner — TOWN OF WAYLAND
Wayland, Massachusetts

Principal Planner — TOWN OF NORTH KINGSTOWN
North Kingstown, Rhode Island

Assistant Planner — CITY OF EAST PROVIDENCE
East Providence, Rhode Island

Planning Consultant — NEWPORT COLLABORATIVE
Newport, Rhode Island

Planning Intern — CITY OF ORANGE CITY
Orange City, Florida

RHODE ISLAND AIR NATIONAL GUARD

Plans and Implementation Communications Specialist
Rhode Island Air National Guard 1995 – Retired 2013

Security Police Officer
Rhode Island Air National Guard 1987 – 1990

CIVIC

May 14, 2018

Juliana Berry, Town Planner/Department Head BPZ
Town of Richmond
5 Richmond Townhouse Road
Richmond, Rhode Island 02898

RE: GD Richmond Beaver River I
5.25 MW AC / 7.45 MW DC
172 Beaver River Road
Richmond, RI

Dear Ms. Berry,

On behalf of the applicant, GD Richmond Beaver River I, LLC, Green Development, LLC has prepared this narrative in support of the Development Plan Submission to the Town of Richmond for review by the Planning Board. This narrative defines the existing conditions of the site and the proposed solar energy project.

Existing Conditions:

The property in question is listed by the Town of Richmond Tax Assessor as Plat 8E, Lot 12 and is situated alongside Beaver River Road. The site is bounded by Beaver River Road to the west and the Beaver River to the east, Shannock Hill Road to the south and private property to the north.

The approximate lot area is 41.76 acres based on the Class I boundary survey completed by National Surveyor-Developers, Inc. The survey was commissioned on April 6, 2018 and completed on April 12, 2018. There is an existing house on the property that is proposed to be razed in conjunction with this proposal. The tax assessors map and GIS depict an easement east of the site off of Marvel Trail. Based on the completed survey and available information the easement does not extend beyond the property line and onto the subject property.

The solar array is located within the existing cleared area onsite that is currently utilized as an agricultural field. The site is gently rolling predominantly to the east and south/southeast toward the wetland area adjacent to the Beaver River. Wetlands on the property were delineated by Mason & Associates, Inc. on February 23, 2018. The wooded swamp wetlands comprise approximately 5.83 acres of the site or 14%. The wooded swamp wetlands as well as the associated riverbank/ perimeter wetlands comprise 13.61 acres or 32.6% of the site.

The site lies within an agricultural overlay and aquifer overlay district.

The Rhode Island Soil Survey (2016) depicts the property as being comprised of seven (7) different soil types:

SOIL NAME	HSG	ACREAGE	DESCRIPTION
AfA*	B	1.97± AC	AGAWAM FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
EfA*	B	14.31± AC	ENFIELD SILT LOAM, 0 TO 3 PERCENT SLOPES
EfB	B	1.68± AC	ENFIELD SILT LOAM, 3 TO 8 PERCENT SLOPES
HkA	A	3.30± AC	HINCKLEY GRAVELLY SANDY LOAM, 0 TO 3 PERCENT SLOPES
HkC	A	5.17± AC	HINCKLEY GRAVELLY SANDY LOAM, ROLLING
Nt*	C	2.29± AC	NINIGRET FINE SANDY LOAM
Ss*	B	3.39± AC	SUDBURY SANDY LOAM
Wa	D	9.65± AC	WALPOLE SANDY LOAM

*PRIME AGRICULTURAL SOILS

THE SOIL ABBREVIATIONS REFERENCE THE SOIL SURVEY OF RHODE ISLAND,PREPARED BY THE USDA SOIL CONSERVATION SERVICE INFORMATION FOUND THROUGH ONLINE RESEARCH FROM RIGIS DATA. THE ABBREVIATIONS CORRESPOND TO SOIL AREAS OUTLINED ON THE PLAN AND ARE TO BE CONSIDERED APPROXIMATE BASED ON RIGIS DATABASE

Note that no removal of topsoil or prime agricultural soil is proposed as part of this project. Any disturbance associated with utility trenches will remain and be re-used onsite.

Local Land-Use Restrictions:

The site is zoned as R-3. The minimum lot size for development within this district is three (3) acres. A front yard setback of 50 feet, a side yard setback of 50 feet and a rear yard setback of 50 feet are required of all solar development within this designation. The following chart has been prepared to depict the Town's setbacks for the R-3 District. These setbacks have been incorporated in the plan set for preliminary planning purposes.

EXISTING ZONE (TABLE 18.20.010)	ZONE R-3 (SINGLE-FAMILY DWELLING)	PROPOSED
MINIMUM LOT AREA:	3 ACRES	41.76± ACRES
MINIMUM FRONTAGE:	300'	2,580'±
MINIMUM FRONT YARD:	50'	N/A
MINIMUM FRONT YARD (SOLAR):	50'	52.3'
MINIMUM SIDE YARD:	35'	N/A
MINIMUM SIDE YARD (SOLAR):	50'	77.7'
MINIMUM REAR YARD:	100'	N/A
MINIMUM REAR YARD (SOLAR):	50'	207.2'
MAXIMUM HEIGHT OF MAIN STRUCTURE:	35'	N/A
MAXIMUM BUILDING COVERAGE:	10%	N/A
MAXIMUM HEIGHT OF SOLAR PANEL:	12'	<12'
MINIMUM SOLAR FIELD COVERAGE:	11 ACRES	23.93± ACRES*

*AREA WITHIN LIMITS OF PROPOSED FENCE. SOLAR ARRAY-19.34± ACRES; SOLAR PANELS ONLY- 9.94± ACRES.

According to the posted Zoning Ordinance for the Town of Richmond, utility-scale solar facilities are permitted by special use on properties within the R-3 zoning designation.

Proposed Overall Project Scope:

Beaver River I, LLC, proposes to construct a 5.25 MW AC (7.45 MW DC) solar energy project on a partially developed lot located at 172 Beaver River Road in the Town of Richmond. The project is proposed to be constructed on an existing cleared area currently utilized as an agricultural field. An existing structure is proposed to be removed. The existing well will be abandoned in accordance with RI Department of Health requirements for private wells and the existing septic system will be abandoned in accordance with RIDEM OWTS requirements.

GREEN development, LLC

Solar Project Data

The proposed solar installation consists of approximately 20,700 ground-mounted solar panel modules. Additionally, it will include 6 transformers, 10 inverters, switch-gear, an underground electrical cable connecting the solar panels to the electrical equipment, and newly installed underground conduit to interconnect with the National Grid circuit on Beaver River Road. The dimensions of each panel are approximately 77.2" tall by 39" wide. The panels will be mounted on pile driven supports at a height of between 9' and 12', dependent on the existing terrain. New utility poles are required by National Grid to be installed on the property for the purpose of interconnection between the solar array and the National Grid circuit that will then transition to underground conduit within the site. At this time six poles are anticipated to be added onto the property but could vary based on National Grid's final design.

The proposed panels encompass approximately 9.9 acres of the 41.76 acres. The total area within the proposed fence is 23.93 acres and the total limit of disturbance associated with the project is 31.12 acres; however, no new clearing along the Beaver River and existing bordering wooded areas is proposed.

A fire safety access drive and 6' chain link security fence are also proposed on the property. No buildings are required for the scope of this project. In addition, water service, sewer service, and on-site wastewater treatment systems are not required.

Landscaping

BETA Group Inc. prepared the proposed landscape plans and detail for the 25' minimum vegetated buffer between the fence and the property boundaries. A 25' minimum area between the fence and the array is also provided. A variety of evergreen tree and shrub species are proposed to provide an effective buffer. The buffer plantings include 856 trees and shrubs.

Stormwater/Soil Erosion

The redevelopment of the site from active agricultural fields to grass cover results in a favorable stormwater runoff condition resulting in greater absorption and reduction in runoff rate and volume. The conversion of the agricultural field to solar will require interim soil erosion and sediment controls including perimeter controls (silt fence/straw wattles/etc.) and sediment traps until the solar project site is stabilized. Once the site is fully stabilized the temporary sediment traps will be removed and restored as pasture /hay field. The project is proposed as one phase with the disturbance areas segregated to one of five sediment traps such that the contributing area to each trap is less than 5 acres. The following reports provide detail on the measures proposed and overall design:

- Stormwater Management Report
- Soil Erosion and Sediment Control Plan

The earliest construction is anticipated to commence is late summer/early fall of 2018 after the corn crop has been harvested. This schedule is subject to the necessary approvals, availability of equipment, and final coordination with National Grid. If the National Grid schedule dictates this work should occur in 2019 the schedule will adjust accordingly.

Below is the anticipated sequence of construction:

Sequence of Construction:

1. FLAG/SURVEY THE LIMIT OF DISTURBANCE.
2. INSTALL THE PERIMETER SOIL EROSION CONTROL MEASURES (SILT SOXX, SILT FENCE OR APPROVED EQUAL)
3. CLEAR AND GRUB THE SITE AS APPLICABLE.
4. INSTALL TEMPORARY SEDIMENT SWALES AND TRAPS.
5. RE-GRADE SITE AS NECESSARY.
6. DEMOLISH AND REMOVE EXISTING ON SITE STRUCTURES IN THEIR ENTIRETY, INCLUDING BUT NOT LIMITED TO THE REMOVAL, DISPOSE AND/OR ABANDONING OF THE EXISTING DWELLING, SHED, FOUNDATIONS, OWTS, WELL, OTHER SERVICING UTILITIES, ETC
7. INSTALL SOLAR PROJECT, INCLUDING BUT NOT LIMITED TO THE INSTALLATION OF THE RACKING, PANELS, PADS, UNDERGROUND CONDUIT, ACCESS PATH, ETC.
8. LOAM AND SEED ALL DISTURBED AREAS.
9. STABILIZE ALL DISTURBED AREAS OF SITE.
10. REMOVE TEMPORARY SEDIMENT SWALES AND TRAPS AFTER ALL TRIBUTARY AREAS ARE FULLY STABILIZED AND AREAS TO BE BROUGHT TO FINAL DESIGN GRADES.

Local/State Permits

The following are the local/state permits that are expected to be necessary for the project prior to construction commencement:

- Special Use Permit (Zoning/ Town)
- Development Plan Review (Planning/Town)
- Freshwater Wetlands/ RIPDES (RIDEM/State)

Operation and Maintenance

There are two elements to the operation and maintenance for the Site. We included an operation and maintenance narrative specific to the solar operation that outlines the aspects of asset management, monitoring, preventative maintenance, and general site /landscape maintenance. This narrative also includes equipment cut sheets. We also included an operation and maintenance program for the stormwater/soil erosion plan as a separate document. This is specific to meet RIDEM requirements and outlines responsible parties, maintenance tasks, public safety considerations (fencing, locked gate, lock box, warning signage), and checklists. During the construction / land disturbance stage inspections are expected weekly while work is progressing and

after rainfall events of .25 inches or greater. Once construction is completed inspections are anticipated to be no more than once per month or as conditions warrant (equipment issues, panels, etc).

Decommissioning

The decommissioning plan that is provided outlines the process that will be followed and includes the following:

- Obtaining the necessary permits (building/demo/etc.)
- Disconnecting the utility (in coordination with National Grid)
- Preparation of a laydown area for staging the removal of the solar infrastructure
- Mobilization of equipment (cranes, trucks, etc.) to facilitate the removal
- Stormwater/soil erosion controls including removal of driveway bedding material and replacement with loam
- Removal of solar modules, transformers, inverters, etc. and packaging for resale, recycling, or disposal as applicable
- Removal of wiring for recycle/scrap value
- Removal of steel racking posts for scrap value
- Removal and disposal of concrete pads
- Top dressing and grading disturbed areas (where pads/access driveway were removed, etc.) and re-seeding disturbed areas as needed

The estimated decommissioning costs after scrap/recycle values are factored in is estimated at $92,696.

If you have any further questions on this matter, please feel free to contact me at your earliest convenience.

Sincerely,

Kevin C. Morin, PE

Director of Civil Engineering

Green Development, LLC

cc: William M. Stamp, Jr. Trustee

John Mancini, Mancini Carter, PC

Soil Erosion and Sediment Control Plan

For:

GD Richmond Beaver River I

172 Beaver River Road

Richmond, Rhode Island 02812

Assessor's Plat 8E Lot 12

Owner:	William M. Stamp Jr, Trustee One Stamp Place Exeter, RI 02882 (401)742-4454 stamp866@verizon.net
Operator:	GD Richmond Beaver River I, LLC Mark DePasquale 3760 Quaker Lane North Kingstown, RI 02852 401-295-4998 md@green-ri.com
Estimated Project Dates:	Start Date: Summer 2019
	Completion Date: Fall 2019
SESC Plan Prepared By:	Green Development, LLC Kevin Morin, PE 3760 Quaker Lane North Kingstown, RI 02852 401-295-4998 km@green-ri.com
SESC Plan Preparation Date:	12/20/18
SESC Plan Revision Date:	

OWNER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am aware that it is the responsibility of the site owner and operator to implement and amend the Soil Erosion and Sediment Control Plan as appropriate in accordance with the requirements of the RIPDES Construction General Permit.

_____

Owner Signature: Date

Owner Name: William M Stamp, Jr, Trustee

Owner Title: Owner

Company Name: N/A

Address: One Stamp Place, Exeter, RI 02882

Phone Number: (401) 742-4454

Email Address: stamp866@verizon.net

OPERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that it is the responsibility of the owner/operator to implement and amend the Soil Erosion and Sediment Control Plan as appropriate in accordance with the requirements of the RIPDES Construction General Permit.

_____

Operator Signature: Date

Contractor Representative: Paul Corrreia

Contractor Title: General Superintendent

Contractor Company Name: Green Development, LLC

Address: 3760 Quaker Lane North Kingstown, RI 02852

Phone Number: 401-295-4998

Email Address: pc@green-ri.com

TABLE OF CONTENTS

This Table of Contents is structured to be automatically populated by Microsoft Word.
Upon final completion of this template, "right-click" anywhere in the Table of Contents, select "Update Field", and then "Update entire table". Page numbers will automatically be synced with the changed document.

INTRODUCTION

The purpose of erosion, runoff, and sedimentation control measures is to prevent pollutants from leaving the construction site and entering waterways or environmentally sensitive areas during and after construction. This SESC Plan has been prepared prior to the initiation of construction activities to address anticipated worksite conditions. The control measures depicted on the site plan and described in this narrative should be considered the minimum measures required to control erosion, sedimentation, and stormwater runoff at the site. Since construction is a dynamic process with changing site conditions, it is the operator's responsibility to manage the site during each construction phase so as to prevent pollutants from leaving the site. This may require the operator to revise and amend the SESC Plan during construction to address varying site and/or weather conditions, such as by adding or realigning erosion or sediment controls to ensure the SESC Plan remains compliant with the RIPDES Construction General Permit. Records of these changes must be added to the amendment log attached to the SESC Plan, and to the site plans as "red-lined" drawings. Please Note: **Even if practices are correctly installed on a site according to the approved plan, the site is only in compliance when erosion, runoff, and sedimentation are effectively controlled throughout the entire site.**

It is the responsibility of the site owner and the site operator to maintain the SESC Plan at the site, including all attachments, amendments and inspection records, and to make all records available for inspection by RIDEM during and after construction. (RIPDES CGP - Part III.G)

The site owner, the site operator, and the designated site inspector are required to review the SESC Plan and sign the Party Certification pages (Section 8). The primary contractor (if different) and all subcontractors (if applicable) involved in earthwork or exterior construction activities are also required to review the SESC Plan and sign the certification pages before construction begins.

Any questions regarding the SESC Plan, control measures, inspection requirements, or any other facet of this document may be addressed to the RIDEM Office of Water Resources, at 401-222-4700 or via email: water@dem.ri.gov.

SOIL EROSION AND SEDIMENT CONTROL PLAN GUIDENCE

SECTION 1: SITE DESCRIPTION

1.1 Project/Site Information

GD Richmond Beaver River I:

- Located at 172 Beaver River Road in the Town of Richmond
- Total Area of the site is approximately 41.76 acres
- The proposed improvements include construction of a solar photovoltaic system

Location Map:

The following are estimates of the construction site area:

- Total Project Area 41.76 acres
- Total Project Area to be Disturbed 35.655 acres

☒ Yes ☒ No The Limits of Disturbance have been marked in the field

Note: We are prepared to mark the limits of the solar project in the field but it is scheduled be plowed for planting corn in the 2018 growing season. The limits will need to be marked after the field is planted and prior to the RIDEM making their site visit in order to address the farmer's schedule. The entire existing field will be plowed and planted this year. Please coordinate the RIDEM site visit accordingly.

1.3 Natural Heritage Area Information

RIPDES CGP - Part III.H

Each project authorized under the RIPDES Construction General Permit must determine if the site is within or directly discharges to a Natural Heritage Area (NHA). DEM Natural Heritage Areas include known occurrences of state and federal rare, threatened and endangered species. Review RIDEM NHA maps to determine if there are natural heritage areas on or near the construction site that may be impacted during construction. For more information you may contact the RIDEM Rhode Island Natural Heritage Program mailto:plan@dem.ri.gov

Are there any Natural Heritage Areas being disturbed by the construction activity or will discharges be directed to the Natural Heritage Area as a result of the construction activity?

☐ Yes ☒ No

If yes, describe or refer to documentation which determines the likelihood of an impact on this area and the steps that will be taken to address any impacts.

- N/A

1.4 Historic Preservation/Cultural Resources

The National Historic Preservation Act, and any state, local, and tribal historic preservation laws apply to construction activities. As with endangered species, some permits may specifically require you to assess the potential impact of your stormwater discharges on historic properties. However, whether or not this is stated as a condition for permit coverage, the National Historic Preservation Act and any applicable state or tribal laws apply to you. Contact the Rhode Island Historic Preservation Officer (http://www.preservation.ri.gov/) or your Tribal Historic Preservation Officer (http://grants.cr.nps.gov/THPO_Review/index.cfm) for more information.

Are there any historic properties, historic cemeteries or cultural resources on or near the construction site?

☐ Yes ☒ No

Describe how this determination was made and summarize state or tribal review comments:

- N/A

If yes, describe or refer to documentation which determines the likelihood of an impact on this historic property, historic cemetery or cultural resource and the steps taken to address that impact including any conditions or mitigation measures that were approved by other parties.

- N/A

SECTION 2: EROSION, RUNOFF, AND SEDIMENT CONTROL

RIPDES Construction General Permit – Part III.J.1 – Erosion, Runoff, and Sediment Controls

The purpose of erosion controls is to prevent sediment from being detached and moved by wind or the action of raindrop, sheet, rill, gully, and channel erosion. Properly installed and maintained erosion controls are the primary defense against sediment pollution.

Runoff controls are used to slow the velocity of concentrated water flows. By intercepting and diverting stormwater runoff to a stabilized outlet or treatment practice or by converting concentrated flows to sheet flow erosion and sedimentation are reduced.

Sediment controls are the last line of defense against moving sediment. The purpose is to prevent sediment from leaving the construction site and entering environmentally sensitive areas.

This section describes the set of control measures that will be installed before and during the construction project to avoid, mitigate, and reduce impacts associated with construction activity. Specific control measures and their applicability are contained in Section Four: Erosion Control Measures, Section Five: Runoff Control Measures, and Section Six: Sediment Control Measures of the *RI SESC Handbook*. The *RI SESC Handbook* can be found at the following address:

http://www.dem.ri.gov/soilerosion2014final.pdf

2.1 Avoid and Protect Sensitive Areas and Natural Features

Per RI Stormwater Design and Installation Standards Manual 3.3.7.1:

Areas of existing and remaining vegetation and areas that are to be protected as identified in the Section 1.6 of the SESC Plan must be clearly identified on the SESC Site Plans for each Phase of Construction. Prior to any land disturbance activities commencing on the site, the Contractor shall physically mark limits of disturbance (LOD) on the site and any areas to be protected within the site, so that workers can clearly identify the areas to be protected.

Constraints are identified to ensure a comprehensive understanding of the project and surrounding areas. The first goal in the low impact development (LID) site planning and design process is to avoid disturbance of natural features. This includes identification and preservation of natural areas that can be used in the protection of water resources. It is important to understand that minimizing the hydrologic alteration of a site is just as important as stormwater treatment for resource protection. Therefore, describe all site features and sensitive resources that exist at the site such as, view barriers,, steep slopes (>15%)that if disturbed will require additional erosion controls, areas with the potential to receive run-on from off-site areas, wetlands, surface waters, and their riparian buffers, specimen trees, natural vegetation, forest areas, stream crossings, historic properties, historic cemeteries or cultural resources that are to be preserved. ***This includes those site features that should be avoided within the designated limits of disturbance.*** *These areas are often identified on a constraints map or in a separate constraints report. For additional discussion on this topic refer to Appendix F. Site Constraint Map of the RI SESC Handbook.*

Describe and illustrate on SESC Site Plans Sensitive Areas and Natural Features and how each will be protected during construction activity. Examples of areas to be protected include vegetated buffers, forests, stands of trees on the perimeter and within the site, large diameter trees, areas designated for infiltration (QPAs), bioretention, rain gardens, and OWTS leachfields. Protection for stands of trees and individual trees to be preserved must be specified and such protection must comply with the RI SESC Handbook and extend to the drip line.

Describe and illustrate on SESC Site Plans based on Constraints Map, the areas that will be disturbed with each phase of construction and the control measures (signs, fences, etc.) that will be used to protect those areas that should not be disturbed. ***This includes marking for limits of disturbance at the perimeter and areas within the limits of disturbance.*** *Acceptable measures include but are not limited to construction fencing (plastic mesh, snow fence, chain link fence etc.) appropriate for the site, boundary markers using construction tape, flagged stakes, etc. for low density use, sediment barriers such as silt fence, compost socks with flagging where also required for sediment control, and signage. The narrative portion of the plan and SESC Site Plans must highlight measures to prevent soil compaction in areas designated as Qualified Pervious Areas (QPAs) and infiltration practices to protect infiltration capacity.*

Feature Requiring Protection	Construction Phase #	Method of Protection	Sheet #
Down gradient undisturbed areas	All Phases	Silt Fence	C1.8

2.2 Minimize Area of Disturbance

Per RI Stormwater Design and Installation Standards Manual 3.3.7.2:

Will >5 acres be disturbed in order to complete this project?

☒ Yes ☐ No

If yes, phasing must be utilized at this site.

Will <5 acres be disturbed or will disturbance activities be completed within a six (6) month window?

☒ Yes ☐ No

If yes, phasing is not required as long as all other performance criteria will be met and phasing is not necessary to protect sensitive or highly vulnerable areas.

Construction is proposed to be completed within a 6 month window. The farmer that owns this property is planting their summer corn crop and immediately after harvest the solar installation will commence assuming all other approvals are in place.

Based on the answers to the above questions will phasing be required for this project?

☐ Yes ☒ No

PHASING PLAN
For each phase of the construction project, provide site estimates of the total area of the project phase, and the total area of the project phase that is expected to undergo soil disturbance.

The following are estimates of each phase of the construction project:

(Copy and paste this section for projects with multiple phases)

Phase No. or Identifier	Phase 1
Total Area of Phase	41.76 acres
Area to be Disturbed	35.655 acres

Description of Construction Sequencing for Phase 1

Proper sequencing of construction activities is essential to maximize the effectiveness of erosion, runoff, and sediment control measures. Construction sequencing of construction activities for each phase must address the following elements:

1. Contractor is responsible for Soil Erosion and Sediment Control (SESC) on site. Sequence of construction provided may be modified as field conditions warrant with prior approval from the Owner or their representative.
2. Construction to begin in late Summer 2019 after corn from the agricultural fields is harvested or upon receipt of all necessary approvals.
3. Survey and stake limit of sedimentation barriers/limit disturbance.
4. Place perimeter erosion control barriers as shown on the plans along limit of disturbance. In no case is the limit of disturbance to extend beyond the sedimentation barriers.

5. Clear crop fields, within LOD. In no case is the limit of disturbance to extend beyond the sedimentation barriers or construction fencing.
6. Prior to removal of stumps and soil disturbance, install temporary sediment swale and traps as per plans. All temporary controls shall be installed per the RISESC,
7. Grub and remove tree stumps on site if necessary. Topsoil is to be stripped and stockpiled in approved locations to be re-used following temporary grading activities for soil erosion measures. Stockpiles are to be protected by a row of silt fence and covered or temporarily seeded.
8. Complete re-grading site as necessary per plans.
9. Install solar project including but not limited to the installation of the racking system, underground conduit, equipment pads, access path, panels, new utility poles onsite, fencing, etc. as required by approved plans.
10. Once rough grade on the site has been established and solar panels/equipment has been installed, disturbed areas shall be loamed and seeded to re-establish vegetation. Erosion control blankets shall be installed as necessary to stabilize soil and promote vegetation.
11. Remove all temporary soil erosion and sedimentation control measures following final vegetative establishment of all disturbed areas.
12. Implement long term operation and maintenance plan.

2.3 Minimize the Disturbance of Steep Slopes

Per RI Stormwater Design and Installation Standards Manual 3.3.7.3:

Are steep slopes (>15%) present within the proposed project area?

☐ Yes ☒ No

2.4 Preserve Topsoil

Per RI Stormwater Design and Installation Standards Manual 3.3.7.4:

Site owners and operators must preserve existing topsoil on the construction site to the maximum extent feasible and as necessary to support healthy vegetation, promote soil stabilization, and increase stormwater infiltration rates in the post-construction phase of the project.

Will existing topsoil be preserved at the site?

☒ Yes ☐ No

The site operator shall strip top soil in the areas of the permeable access driveway and utility trenches as needed within the proposed project limit of disturbance areas. Top Soil shall be stockpiled in the location specified on the SESC plan. Stock Pile areas shall be surrounded by silt fence or approved erosion control measures to prevent migration of soils during rain events. Upon project completion, the site operation shall redistribute top soil over disturbed areas ensuring at minimum a 4" layer is provided over all disturbed areas. No topsoil is allowed to leave the project site as per Town ordinances. Additional material shall be brought on site should the need arise. Final top soil areas have been shown on the site plans as landscape areas. Top soil should be screened and free of weeds, sticks, and stones over ¾" in size and otherwise complying with section M.18.01 of the RIDOT Standard Specifications for Road and Bridge Construction. Contractor shall follow recommendations provided by the landscape plans and the Landscape Architect.

Soil compaction must be minimized by maintaining limits of disturbance throughout construction. In instances where site soils are compacted the site owner and operator must restore infiltration capacity of

the compacted soils by tilling or scarifying compacted soils and amending soils as necessary to ensure a minimum depth of topsoil is available in these areas. In areas where infiltrating stormwater treatment practices are located compacted soils must be amended such that they will comply the design infiltration rates established in the *RI Stormwater Design and Installation Standards Manual*.

In areas of where over compaction has been compromised the natural infiltration rate of onsite soils, the contractor shall scarifying or till these areas to restore them to their natural state. Areas prone to over compaction are paths proposed to be used by construction equipment and construction equipment storage areas. Construction equipment storage areas are shown on the SESC Plan. See Sheet C1.8.

2.5 Stabilize Soils

Per RI Stormwater Design and Installation Standards Manual 3.3.7.5:

Upon completion and acceptance of site preparation and initial installation of erosion, runoff, and sediment controls and temporary pollution prevention measures, the operator shall initiate appropriate temporary or permanent stabilization practices during all phases of construction on all disturbed areas as soon as possible, but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased.

Any disturbed areas that will not have active construction activity occurring within 14 days must be stabilized using the control measures depicted in the SESC Site Plans, in accordance with the *RI SESC Handbook*, and per manufacturer product specifications.

Only areas that can be reasonably expected to have active construction work being performed within 14 days of disturbance will be cleared/grubbed at any one time. It is NOT acceptable to clear and grub the entire construction site if portions will not be active within the 14-day time frame. Proper phasing of clearing and grubbing activities shall include temporary stabilization techniques for areas cleared and grubbed that will not be active within the 14-day time frame.

All disturbed soils exposed prior to October 15 of any calendar year shall be seeded by that date if vegetative measures are the intended soil stabilization method. Any such areas that do not have adequate vegetative stabilization, as determined by the site operator or designated inspector, by November 15, must be stabilized through the use of non-vegetative erosion control measures. If work continues within any of these areas during the period from October 15 through April 15, care must be taken to ensure that only the area required for that day's work is exposed, and all erodible soil must be restabilized within 5 working days. In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed (i.e. construction of a motocross track).

- When construction activities have temporarily or permanently ceased, stabilization controls shall consist of one or more of the following:
    - Seeding with native vegetation
    - Straw or straw application, in the amount of 2 tons/acre (temporary only)
    - Fiber mulch or covering consisting of mat/fiber lining (temporary only)
- Dust control generation shall be controlled by one or more of the following:
    - Vegetative cover (see stabilization controls above)
    - Sprinkle site with water until surface is wet. Take care to not create runoff from excessive use of water. The general contractor shall have an on-site water vehicle for dust control.
    - Stone to stabilize construction roads
    - Calcium chloride (only with approval of the Design Engineer)

<u>Temporary Vegetative Control Measures</u>

- When construction activities have temporarily ceased, stabilization controls shall consist of one or more of the following:
    1. Hydro Seeding
    2. Seeding with native vegetation

Temporary Non-Vegetative Control Measures

- When construction activities have temporarily ceased, stabilization controls shall consist of one or more of the following:
    1. Mulching
    2. Rolled Erosion control mats – Steep Slopes >15%
    3. Rolled Erosion control netting

Non Vegetative Control Measures

- When construction activities have temporarily ceased, stabilization controls shall consist of one or more of the following:
    1. Hydro Seeding
    2. Seeding with native vegetation
    3. Sodding

2.6 Protect Storm Drain Outlets

Per RI Stormwater Design and Installation Standards Manual 3.3.7.7:

Temporary or permanent outlet protection must be used to prevent scour and erosion at discharge points through the protection of the soil surface, reduction in discharge velocities, and through the promotion of infiltration. Outlets often have high velocity, high volume flows, and require strong materials that will withstand the forces of stormwater. Storm drain outlet control measures also offer a last line of protection against sediment entering environmentally sensitive areas.

All stormwater outlets that may discharge sediment-laden stormwater flow from the construction site must be protected using the control practices depicted on the approved plan set and in accordance with the *RI SESC Handbook*.

Describe controls, including design specifications and details, which will be implemented to protect outlets discharging stormwater from the project.

Will temporary or permanent point source discharges be generated at the site as the result of construction of sediment traps or basins, diversions, and conveyance channels?

☐ Yes ☒ No

If Yes, describe the method(s) of outlet protection specified for each instance where a point source discharge will be generated. In addition, specifically reference SESC Site Plan Sheet Numbers which identify where the outlets will be constructed at the site and the corresponding control measures that will be utilized for their protection including any associated specifications required for their installation and maintenance.

N/A

If No, discuss rationale for not including these elements in the SESC Plan.

Natural sheet flow patterns are maintained. See Sheet C1.8

2.7 Establish Temporary Controls for the Protection of Post-Construction Stormwater Treatment Practices

Per RI Stormwater Design and Installation Standards Manual 3.3.7.8:

Temporary measures shall be installed to protect permanent or long-term stormwater control and treatment measures as they are installed and throughout the construction phase of the project so that they will function properly when they are brought online.

Examples of temporary control measures that can be used to protect permanent stormwater control measures include: establishing temporary sediment barriers around infiltrating practices, ensuring proper material staging areas and equipment routing (i.e. do not allow construction equipment to compact areas where infiltrating practices will be installed), and by conducting final cleaning of structural long term practices after construction is completed.

List and describe all post-construction stormwater treatment practices that will be installed during the construction process. Next, outline how these measures will be protected during the construction phase of the project to ensure that they will function appropriately once they are brought online.

Will long-term stormwater treatment practices be installed at the site?

☐ Yes ☒ No

If Yes, describe the specific long-term stormwater treatment practices that will require protection from sedimentation and compaction. In addition, specifically reference SESC Site Plan Sheet Numbers which identify the location of these practices and the corresponding control measures that will be utilized for their protection including any associated specifications required for their installation and maintenance.

N/A

If No, discuss rationale for not including these elements in the SESC Plan.

The existing agricultural areas that are farmed for crops during the growing season and fallow for the remainder of the year are proposed to be removed entirely and grass seed applied in and around the entire solar array field to improve the runoff conditions from pre-development to post-development. The primary focus will be to capture sediments during the transition from farm to solar with temporary sediment traps and to limit the disturbance required for the installation of the solar field.

2.8 Divert or Manage Run-on from Up-gradient Areas

Per RI Stormwater Design and Installation Standards Manual 3.3.7.10:

Is stormwater from off-site areas anticipated to flow onto the project area or onto areas where soils will be disturbed?

☒ Yes ☐ No

If Yes, describe the specific runoff control measures (i.e., check dams, water bars, diversions, perimeter dikes, lined waterways, vegetated waterways, temporary line channels, sediment barriers, pipe slope drains, etc.) that will be utilized at the site including references to the SESC Site Plan Sheet Numbers, design specifications and details. See the RI SESC Handbook,Section Five: Runoff Control Measures for additional guidance.

Pre-Construction and Construction sub-watershed maps are included for each phase in this SESC Plan submittal.

Structural control measures will be used to limit stormwater flow from coming onto the project area, and to divert and slow on-site stormwater flow that is expected to impact exposed soils for the purpose of minimizing erosion, runoff, and the discharge of pollutants from the site.

Control measures shall be installed as depicted on the approved plan set and in accordance with the *RI SESC Handbook* or the *RI Department of Transportation Standard Specifications for Road and Bridge Construction*. **Run-on and Run-off Management**				
Construction Phase #	On-site or Off-site Run-on?	Control measure	Identified on Sheet #	Detail(s) is/are on Sheet #
ALL	Off - Site	Silt Fence	C1.8	C1.9

2.9 Retain Sediment Onsite through Structural and Non-Structural Practices

Per RI Stormwater Design and Installation Standards Manual 3.3.7.12:

Once the erosion control measures and the run-on diversions are identified and located on the plans, the next step to site planning is sediment control and sediment management. Sediment barriers, inlet protection, construction entrances, stockpile containment, temporary sediment traps, and temporary sediment basins must be integrated into the SESC Plan if applicable. Refer to the RI SESC Handbook Section Six: Sediment Control Measures for additional guidance.

Per RI Stormwater Design and Installation Standards Manual 3.3.7.9:

SEDIMENT BARRIERS must be installed along the perimeter areas of the site that will receive stormwater from disturbed areas. This also may include the use of sediment barriers along the contour of disturbed slopes to maintain sheet flow and minimize rill and gully erosion during construction. Installation and maintenance of sediment barriers must be completed in accordance with the maintenance requirements specified by the product manufacturer or the *RI SESC Handbook*.

Will sediment barriers be utilized at the toe of slopes and other downgradient areas subject to stormwater impacts and erosion during construction?

☒ Yes ☐ No

Will sediment barriers be utilized along the contour of slopes to maintain sheet flow and minimize rill and gully erosion during construction?

☒ Yes ☐ No

If Yes, list the specific sediment barriers that will be used at the site in the table provided. Describe the rationale for the locations and spacing frequency selected by the designer based on slope length and steepness. For additional guidance refer to the RI SESC Handbook or sediment barrier manufacturer's specifications.

SEDIMENT BARRIERS			
Construction Phase #	Sediment Barrier Type	Sediment Barrier is Labeled on Sheet #	Detail is on Sheet #
ALL	Silt Fence	C1.8	C1.9

Per RI Stormwater Design and Installation Standards Manual 3.3.7.6:

INLET PROTECTION will be utilized to prevent soil and debris from entering storm drain inlets. These measures are usually temporary and are implemented before a site is disturbed. ALL stormwater inlets &/or catch basins that are operational during construction and have the potential to receive sediment-laden stormwater flow from the construction site must be protected using control measures outlined in the *RI SESC Handbook*.

For more information on inlet protection refer to the *RI SESC Handbook*, Inlet Protection control measure.

Maintenance

The operator must clean, or remove and replace the inlet protection measures as sediment accumulates, the filter becomes clogged, and/or as performance is compromised. Accumulated sediment adjacent to the inlet protection measures should be removed by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible.

Do inlets exist adjacent to or within the project area that require temporary protection?

☐ Yes ☒ No

Existing on-site and off-site drainage inlets must be protected during construction. All inlet protections shall be maintained per the RI SESC handbook and manufacturers recommendations.

The following lists the proposed storm drain inlet types selected from Section Six of the *RI SESC Handbook*. Each row is unique for each phase and inlet protection type.

INLET PROTECTION			
Construction Phase #	Inlet Protection Type	Inlet Protection is labeled on Sheet #	Detail(s) is/are on Sheet #
1	Fabric Drop , Curb Drop	3 of 12	11 of 12
Insert Text	Insert Text	Insert Text	Insert Text
Insert Text	Insert Text	Insert Text	Insert Text
Insert Text	Insert Text	Insert Text	Insert Text

CONSTRUCTION ENTRANCES will be used in conjunction with the stabilization of construction roads to reduce the amount of sediment tracking off the project. This project has avoided placing construction entrances on poorly drained soils where possible. Where poorly drained soils could not be eliminated, the detail includes subsurface drainage.

Any construction site access point must employ the control measures on the approved SESC site plans and in accordance with the *RI SESC Handbook*. Construction entrances shall be used in conjunction with the stabilization of construction roads to reduce the amount of mud picked up by construction vehicles. All construction access roads shall be constructed prior to any roadway accepting construction traffic.

The site owner and operator must:

1. Restrict vehicle use to properly designated exit points.

2. Use properly designed and constructed construction entrances at all points that exit onto paved roads so that sediment removal occurs prior to vehicle exit.

3. When and where necessary, use additional controls to remove sediment from vehicle tires prior to exit (i.e. wheel washing racks, rumble strips, and rattle plates).

4. Where sediment has been tracked out from the construction site onto the surface of off-site streets, other paved areas, and sidewalks, the deposited sediment must be removed by the end of the same work day in which the track out occurs. Track-out must be removed by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal.

Will construction entrances be utilized at the proposed construction site?

☒ Yes ☐ No

If Yes, indicate location(s) of vehicle entrance(s) and exit(s), and stabilization practices used to prevent sediment from being tracked off-site in the table provided. See also RI SESC Handbook, Section Six, Construction Entrances Measure.

CONSTRUCTION ENTRANCE			
Construction Phase #	Soil Type at the Entrance	Entrance is located on Sheet #	Detail is on Sheet #
ALL	B	C1.8	C1.9

STOCKPILE CONTAINMENT will be used onsite to minimize or eliminate the discharge of soil, topsoil, base material or rubble, from entering drainage systems or surface waters. All stockpiles must be located within the limit of disturbance, protected from run-on with the use of temporary sediment barriers and provided with cover or stabilization to avoid contact with precipitation and wind where and when practical.

Stock pile management consists of procedures and practices designed to minimize or eliminate the discharge of stockpiled material (soil, topsoil, base material, rubble) from entering drainage systems or surface waters.

For any stockpiles or land clearing debris composed, in whole or in part, of sediment or soil, you must comply with the following requirements:

1. Locate piles within the designated limits of disturbance.

2. Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier.

3. Where practicable, provide cover or appropriate temporary vegetative or structural stabilization to avoid direct contact with precipitation or to minimize sediment discharge.

4. NEVER hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or surface water.

5. To the maximum extent practicable, contain and securely protect from wind.

STOCKPILE CONTAINMENT				
Construction Phase #	Run-on measures necessary? (yes/no)	Stabilization or Cover Type	Stockpile Containment Measure	Sheet #
ALL	No	Top and Sub-soil piles should be covered or vegetated	Silt Fence	C1.8

CONSTRUCTED SEDIMENT STRUCTURES

If each common drainage location receives water from an area with less than one (1) acre disturbed at a time, this section can be deleted and no sediment traps or basins are required. However, it is important to remember that there is still a requirement to retain sediment on-site. Therefore, if it is in the best professional judgment of the designer, that there is a condition or circumstance which may require structural controls (per Section 3.3.7.13 of the RI Stormwater Design and Installation Standards Manual), this section can be used.

TEMPORARY SEDIMENT TRAPS will be utilized onsite. There will be no disturbed drainage areas greater than one acre that will be exposed for longer than six months. Design and sizing calculations in accordance with the *RI SESC Handbook*, Section Six are found in an attachment of this SESC Plan. A summary of the calculations are provided below:

For Disturbed Areas 1 to 5 Acres – Those areas with a common drainage location that serves an area between one (1) and five (5) acres disturbed at one time, a temporary sediment trap must be provided where attainable and where the sediment trap is only intended to be used for a period of six (6) months or less. For longer term projects with a common drainage location that serves between one (1) and five (5) acres disturbed at one time, a temporary sediment basin must be provided where attainable. Temporary sediment trapping practices must be designed in accordance with the RI SESC Handbook and must be sized to have a total storage volume capable of storing one (1) inch of runoff from the contributing area or one hundred and thirty four (134) cubic yards per acre of drainage area. A minimum of fifty percent (50%) of the total volume shall be storage below the outlet (wet storage). See RISDISM 3.3.7.12 for requirements and RI SESC Handbook, Section Six: Temporary Sediment Traps Measure for design details.

Are temporary sediment traps required at the site?

☒ Yes ☐ No

If Yes, complete the table provided. If an area greater than one acre will be exposed for longer than 6 months and a sediment trap is proposed, explain why the sediment basin was not attainable.

SEDIMENT TRAPS				
Construction Phase #	Exposed Area (acres)	Trap #	Sheet #	Detail found on Sheet#

ALL	4.841	1	C1.8	C1.9
ALL	4.980	2	C1.8	C1.9
ALL	4.891	3	C1.8	C1.9
ALL	4.984	4	C1.8	C1.9
ALL	2.753	5	C1.8	C1.9
ALL	3.694	6	C1.8	C1.9

Trap #	Wet Storage Volume (cu.ft)	Dry Storage Volume (cu.ft.)	Cleanout Depth (ft)	Provide Reference to Location of Supporting Design and Sizing Calculations
1	10,181	13,420	4.0	Attachment
2	9,056	11,524	3.0	Attachment
3	8,884	11,161	2.0	Attachment
4	9,092	11,235	2.0	Attachment
5	5,009	6,233	2.0	Attachment
6	6,716	8,272	2.0	Attachment

All traps will be functional and installed prior to disturbance for the solar project in the contributing drainage area. Access for sediment removal is provided on the plans with cleanout depth requirements. The removed sediment will be utilized onsite or disposed of properly off-site.

2.10 Properly Design Constructed Stormwater Conveyance Channels

Conveyances are required to be designed for inlets to temporary sediment basins. The construction site planner must use best professional judgment to determine if additional conveyance design is required for run-on control or in any other location where velocity control is required.

Are temporary stormwater conveyance practices required in order to properly manage runoff within the proposed construction project?

☒ Yes ☐ No

Temporary swales have been shown on sheet C1.8. Swales have been designed to handle the 10-year storm and be non erosive. Flows within the swales do not exceed 1.5 ft/s and will be grassed.

The conveyance will be maintained as depicted on SESC Site Plans and in accordance with the *RI SESC Handbook* and if applicable.

2.11 Erosion, Runoff, and Sediment Control Measure List

Complete the following table for each Phase of construction where Erosion, Runoff, and Sediment Control Measures are located. This table is to be used as part of the SESC Plan Inspection Report – please fill out accordingly.

It is expected that this table and corresponding Inspection Reports will be amended as needed throughout the construction project as control measures are added or modified.

Phase No. #

Location/Station	Control Measure Description/Reference	Maintenance Requirement
Down gradient Limit of disturbance Silt Fence	Straw Wattle/Straw Bales and/or Silt Fence Section Six: Sediment Control Measures – RI SESC Handbook.	Inspection should be made after each storm event and repair or replacement should be made promptly as needed. Cleanout of accumulated sediment behind the bales is necessary if ½ of the original height of the bales becomes filled in with sediment.
Construction Entrances	Stone Stabilized Pad. Section Six: Sediment Control Measures – Construction Entrances –RI SESC Handbook. Constriction pad per RIDOT Standard 9.9.0	The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto paved surfaces. Provide periodic top dressing with additional stone or additional length as conditions demand. Roads adjacent to entrance shall be cleaned at the end of each day. If maintenance alone is not enough to prevent excessive track out, increase length of entrance, modify construction access road surface, or install washrack or mudrack.
Temporary Sediment Trap	Temporary Sediment Traps, Section Six: Sediment Control Measures – RI SES Handbook	Inspect trap a minimum once per week or within 24 hours after a rainfall event greater than ¼". Remove sediments when half of the minimum required volume of the wet storage is exceeded.

SECTION 3: CONSTRUCTION ACTIVITY POLLUTION PREVENTION

Per RI Stormwater Design and Installation Standards Manual 3.3.7.14:

The purpose of construction activity pollution prevention is to prevent day to day construction activities from causing pollution.

This section describes the key pollution prevention measures that must be implemented to avoid and reduce the discharge of pollutants in stormwater. Example control measures include the proper management of waste, material handling and storage, and equipment/vehicle fueling/washing/maintenance operations.

Where applicable, include *RI SESC Handbook* or the *RI Department of Transportation Standard Specifications for Road and Bridge Construction* (as amended) specifications.

3.1 Existing Data of Known Discharges from Site

Per RIPDES Construction General Permit – Part III.I:

List and provide existing data (if available) on the quality of any known discharges from the site. Examples include discharges from existing stormwater collection systems, discharges from industrial areas of the site, etc.

Are there known discharges from the project area?

☐ Yes ☒ No

Describe how this determination was made:

- Existing Conditions Survey and online GIS Information revealed no known discharges from the project area.

If yes, list discharges and locations:

- N/A

Is there existing data on the quality of the known discharges?

☐ Yes ☒ No

If yes, provide data:

- N/A

3.2 Prohibited Discharges

Per RI SESC Handbook – Part D

The following discharges are prohibited at the construction site:

- Contaminated groundwater, unless specifically authorized by the DEM. These types of discharges may only be authorized under a separate DEM RIPDES permit.
- Wastewater from washout of concrete, unless the discharge is contained and managed by appropriate control measures.
- Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials.
- Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance. Proper storage and spill prevention practices must be utilized at all construction sites.
- Soaps or solvents used in vehicle and equipment washing.
- Toxic or hazardous substances from a spill or other release.

All types of waste generated at the site shall be disposed of in a manner consistent with State Law and/or regulations.

Will any of the above listed prohibited discharges be generated at the site?

☐ Yes ☒ No

3.3 Proper Waste Disposal

Per RI SESC Handbook – Part D

Building materials and other construction site wastes must be properly managed and disposed of in a manner consistent with State Law and/or regulations.

- A waste collection area shall be designated on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a waterbody or storm drain.
- All waste containers shall be covered to avoid contact with wind and precipitation.
- Waste collection shall be scheduled frequently enough to prevent containers from overfilling.

- All construction site wastes shall be collected, removed, and disposed of in accordance with applicable regulatory requirements and only at authorized disposal sites.

- Equipment and containers shall be checked for leaks, corrosion, support or foundation failure, or other signs of deterioration. Those that are found to be defective shall be immediately repaired or replaced.

Is waste disposal a significant element of the proposed project?

☐ Yes ☒ No

General construction waste is anticipated. Before construction begins, an area within the project limits will be designated as a waste collection area. A waste collection time will be arranged so that the containers do not overflow. In the event that a container does spill, cleanup will be provided immediately. The construction waste will be collected, removed, and disposed of only at authorized disposal areas. All waste shall be disposed of in a manner consistent with federal, state and local regulations. Construction debris shall be disposed of daily to avoid exposure to precipitation.

3.4 Spill Prevention and Control

Per RI SESC Handbook – Part D

All chemicals and/or hazardous waste material must be stored properly and legally in covered areas, with containment systems constructed in or around the storage areas. Areas must be designated for materials delivery and storage. All areas where potential spills can occur and their accompanying drainage points must be described. The owner and operator must establish spill prevention and control measures to reduce the chance of spills, stop the source of spills, contain and clean-up spills, and dispose of materials contaminated by spills. The operator must establish and make highly visible location(s) for the storage of spill prevention and control equipment and provide training for personnel responsible for spill prevention and control on the construction site.

Are spill prevention and control measures required for this particular project?

☐ Yes ☒ No

- The construction site supervisor will create and adopt a spill control plan that includes measures to stop the source of the spill, contain the spill, clean up the spill, dispose of materials contaminated by the spill, and identify and train personnel responsible for spill prevention and control. The following measures will be appropriate for a spill prevention and response plan.
- Store and handle materials to prevent spills
    - Tightly seal containers
    - Make sure all containers are clearly labeled
    - Stack containers neatly and securely
- Reduce storm water contact if there is a spill
    - Have cleanup procedures clearly posted
    - Have cleanup materials readily available
    - Contain any liquid
    - Stop the source of the spill
    - Cover spill with absorbent materials such as sawdust

- At no time shall spills be cleaned and/or flushed down storm drains or to any environmentally sensitive area (stream, pond, wetland etc.)
- Dispose of contaminated materials according to manufacturer's instructions or according to state or local requirements.
- Equipment/vehicle fueling and repair/maintenance operations or hazardous material storage shall not take place within regulated wetlands or buffer zone area. Designated areas shall be approved by site owner and project engineer.
- Identify personnel responsible for responding to spill of toxic or hazardous materials.
    - Provide personnel spill response training
    - Post names of spill response personnel
    - Keep the spill area well ventilated
    - If necessary, use a private firm that specializes in spill cleanup
- Spills that exceed Reportable Quantity (RQ) levels or reportable materials must be reported and documented.
    - Notify the Rhode Island Department of Environmental Management (401) 222-3961, (401) 222-6519 or (401) 222-2284 at night as soon as there is knowledge of a spill.
    - Notify the permitting authority in writing within 5 days.
    - The SESC must be modified within 14-days to provide a description of the release, the circumstances leading to the release and the date of the release.
- Stone Stabilization Pad (RI Standard 9.9.0)
    - Located at construction site entrance/exit as shown on the SESC Site Plans.
    - The maintenance shall include top dressing with additional stone or additional length as conditions demand or as directed by the engineer.
    - Sediments spilled, dropped, washed or tracked on the public right of way must be removed immediately by the contractor and disposed of according to all applicable regulations.

3.5 Control of Allowable Non-Stormwater Discharges

Per RIPDES Construction General Permit – Part III.J.2.e:

Discharges not comprised of stormwater are allowed under the RIPDES Construction General Permit but are limited to the following: discharges which result from the washdown of vehicles where no detergents are used; external building wash-down where no detergents are used; the use of water to control dust; firefighting activities; fire hydrant flushing; natural springs; uncontaminated groundwater; lawn watering; potable water sources including waterline flushing; irrigation drainage; pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled materials have been removed) and where detergents are not used; and foundation or footing drains where flows are not contaminated with process materials such as solvents, or contaminated by contact with soils where spills or leaks of toxic or hazardous materials has occurred. If any of these discharges may reasonably be expected to be present and to be mixed with stormwater discharges, they must be specifically listed here.

Are there allowable non-Stormwater discharges present on or near the project area?

☐ Yes ☒ No

List of allowable non-stormwater discharge(s) and the associated control measure(s):

- Water for Dust Control

If any existing or proposed discharges consist of contaminated groundwater, such discharges are not authorized under the RIPDES Construction General Permit. These discharges must be permitted separately by seeking coverage to treat and discharge under a separate RIPDES individual permit or under the RIPDES Remediation General Permit. Contact the RIDEM Office of Water Resources RIPDES Permitting Program at 401-222-4700 for application requirements and additional information.

Are there any known or proposed contaminated discharges, including anticipated contaminated dewatering operations, planned on or near the project area?

☐ Yes ☒ No

If yes, list the discharge types and the RIPDES individual permit number(s) or RIPDES Remediation General Permit Authorization number(s) associated with these discharges.

- N/A

3.6 Control Dewatering Practices

Per RI SESC Handbook – Part D

Site owners and operators are prohibited from discharging groundwater or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, unless such waters are first effectively managed by appropriate control measures.

Examples of appropriate control measures include, but are not limited to, temporary sediment basins or sediment traps, sediment socks, dewatering tanks and bags, or filtration systems (e.g. bag or sand filters) that are designed to remove sediment. Uncontaminated, non-turbid dewatering water can be discharged without being routed to a control.

At a minimum the following discharge requirements must be met for dewatering activities:

1. Do not discharge visible floating solids or foam.
2. To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. In no case will surface waters be considered part of the treatment area.
3. At all points where dewatering water is discharged, utilize velocity dissipation devices.
4. With filter backwash water, either haul it away for disposal or return it to the beginning of the treatment process.
5. Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.
6. Dewatering practices must involve the implementation of appropriate control measures as applicable (i.e. containment areas for dewatering earth materials, portable sediment tanks and bags, pumping settling basins, and pump intake protection.)

Is it at all likely that the site operator will need to implement construction dewatering in order to complete the proposed project?

☐ Yes ☒ No

Existing groundwater is located well below existing grade. If encountered, any dewatering practices must comply with the RI SESC Handbook. Dewatering basins shall be used on site and comply with RIDOT Standard 9.7.0 or approved equal. Contractor to submit alternatives to project engineer for approval.

3.7 Establish Proper Building Material Staging Areas

Per RI SESC Handbook – Part D

All construction materials that have the potential to contaminate stormwater must be stored properly and legally in covered areas, with containment systems constructed in or around the storage areas. Areas must be designated for materials delivery and storage. Designated areas shall be approved by the site owner/engineer. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in the discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

- An inventory will be kept of all reportable materials and all materials with a reportable quantity on site. There will be neat and orderly storage of hazardous materials. Regular garbage, rubbish, construction waste, and sanitary waste disposal will be employed. There will be prompt cleanup of any spills, either liquid or dry materials. The following practices will be used to avoid problems associated with the disposal of hazardous materials.
- Check with local waste management authorities to determine what the requirements are for disposing of hazardous materials.
- Use the entire product before disposing of the container.
- Do not remove the original product label from the container, since it contains important information.
- If surplus products must be disposed, do not mix products together unless specifically recommended by the manufacturer.
- The correct method of disposal of hazardous materials varies with the product use. Follow the manufacturer's recommended method, which is often found on the label.
- Construction materials will consist of any or all of the following:

• Concrete	• Fertilizers
• Loam	
• Gravel for Roadway	• Electrical Materials/Supplies

3.8 Minimize Dust

Per RI SESC Handbook – Part D

Dust control procedures and practices shall be used to suppress dust on a construction site during the construction process, as applicable. Precipitation, temperature, humidity, wind velocity and direction will determine amount and frequency of applications. However, the best method of controlling dust is to prevent dust production. This can best be accomplished by limiting the amount of bare soil exposed at one time. Dust Control measures outlined in the *RI SESC Handbook* shall be followed. Other dust control methods include watering, chemical application, surface roughening, wind barriers, walls, and covers.

- Dust control will be utilized throughout the entire construction process. For example, keeping disturbed surfaces moist during windy periods will be an effective control measure, especially for construction haul roads. The use of dust control will prevent the movement of soil to offsite

areas. However, care must be taken to not create runoff from excessive use of water to control dust. The following are methods of Dust Control that may be used on-site:

- Vegetative Cover - The most practical method for disturbed areas not subject to traffic.
- Sprinkling - The site may be sprinkled until the surface is wet. Sprinkling will be effective for dust control on haul roads and other traffic routes.
- Stone - Stone will be used to stabilize construction roads; it will also be effective for dust control.
- Calcium Chloride – Calcium Chloride or other additive may be used with approval of Engineer.
- The general contractor will have an on-site water vehicle to control dust.

3.9 Designate Washout Areas

Per RI SESC Handbook – Part D

At no time shall any material (concrete, paint, chemicals) be washed into storm drains, open ditches, streets, streams, wetlands, or any environmentally sensitive area. The site operator must ensure that construction waste is properly disposed of, to avoid exposure to precipitation, at the end of each working day.

Will washout areas be required for the proposed project?

☒ Yes ☐ No

- The construction site supervisor shall establish a washout area prior to construction as indicated on sheet C1.8. This area shall not be located in or adjacent to a temporary sediment traps.
- Concrete trucks may be allowed to wash out or discharge surplus concrete or drum wash water in the washout area. However, this material must be disposed of in a manner that prevents contact between these materials and stormwater runoff.

3.10 Establish Proper Equipment/Vehicle Fueling and Maintenance Practices

Per RI SESC Handbook – Part D

Vehicle fueling shall not take place within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system. Designated areas shall be depicted on the SESC Site Plans, or shall be approved by the site owner.

Vehicle maintenance and washing shall occur off-site, or in designated areas depicted on the SESC Site Plans or approved of by the site owner. Maintenance or washing areas shall not be within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system. Maintenance areas shall be clearly designated, and barriers shall be used around the perimeter of the maintenance area to prevent stormwater contamination.

Construction vehicles shall be inspected frequently for leaks. Repairs shall take place immediately. Disposal of all used oil, antifreeze, solvents and other automotive-related chemicals shall be according to applicable regulations; at no time shall any material be washed down the storm drain or in to any environmentally sensitive area.

Vehicle fueling storage and maintenance should only be done in the area as shown on sheet C1.8. Any spills should be handled per section 3.4.

3.11 Chemical Treatment for Erosion and Sediment Control

Per RI SESC Handbook – Appendix J

Chemical stabilizers, polymers, and flocculants are readily available on the market and can be easily applied to construction sites for the purposes of enhancing the control of erosion, runoff, and sedimentation. The following guidelines should be adhered to for construction sites that plan to use treatment chemicals as part of their overall erosion, runoff, and sedimentation control strategy.

The U.S. Environmental Protection Agency has conducted research into the relative toxicity of chemicals commonly used for the treatment of construction stormwater discharges. The research conducted by the EPA focused on different formulations of chitosan, a cationic compound, and both cationic and anionic polyacrylamide (PAM). In summary, the studies found significant toxicity resulting from the use of chitosan and cationic PAM in laboratory conditions, and significantly less toxicity associated with using anionic PAM. EPA's research has led to the conclusion that the use of treatment chemicals for erosion, runoff, and sedimentation control requires proper operator training and appropriate usage to avoid risk to aquatic species. In the case of cationic treatment chemicals additional safeguards may be necessary.

Application/Installation Minimum Requirements

If a site operator plans to use polymers, flocculants, or other treatment chemicals during construction the SESC plan must address the following:

1. Treatment chemicals shall not be applied directly to or within 100 feet of any surface water body, wetland, or storm drain inlet.

2. Use conventional erosion, runoff, and sedimentation controls prior to and after the application of treatment chemicals. Use conventional erosion, runoff, and sedimentation controls prior to chemical addition to ensure effective treatment. Chemicals may only be applied where treated stormwater is directed to a sediment control (e.g. temporary sediment basin, temporary sediment trap or sediment barrier) prior to discharge.

3. Sites shall be stabilized as soon as possible using conventional measures to minimize the need to use chemical treatment.

4. Select appropriate treatment chemicals. Chemicals must be selected that are appropriately suited to the types of soils likely to be exposed during construction and to the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or treatment area. **Soil testing is essential. Using the wrong form of chemical treatment will result in some form of performance failure and unnecessary environmental risk.**

5. Minimize discharge risk from stored chemicals. Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures (e.g., spill berms, decks, spill containment pallets), or provide equivalent measures, designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means (e.g., storing chemicals in covered areas or having a spill kit available on site).

6. Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier. You must also use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal design specifications provided by the supplier of the applicable chemicals, or document specific departures from these practices or specifications and how they reflect good engineering practice.

Will chemical stabilizers, polymers, flocculants or other treatment chemicals be utilized on the proposed construction project?

☐ Yes ☒ No

3.12 Construction Activity Pollution Prevention Control Measure List

Complete the following table for each Phase of construction where Pollution Prevention Control Measures will be implemented. This table is to be used as part of the SESC Plan Inspection Report – please fill out accordingly.

It is expected that this table will be amended as needed throughout the construction project.

Phase No. #		
Location/Station	**Control Measure Description/Reference**	**Maintenance Requirement**
Adjacent Roads	Public roads adjacent to a construction site shall be clean at the end of each day.	Street Sweep if construction site sediment is visible
Site Wide	Pick up of construction trash and debris.	All loose trash and debris must be disposed of properly at the end of each working day.
Construction Entrances	Stone Stabilized Pad. Section Six: Sediment Control Measures – Construction Entrances –RI SESC Handbook. Constriction pad per RIDOT Standard 9.9.0	The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto paved surfaces. Provide periodic top dressing with additional stone or additional length as conditions demand. Roads adjacent to entrance shall be cleaned at the end of each day. If maintenance alone is not enough to prevent excessive track out, increase length of entrance, modify construction access road surface, or install washrack or mudrack.
Water or Calcium Chloride application for Dust Control	Dust Control, Section Three: Pollution Prevention and Good House Keeping –RI SESC Handbook.	When temporary measures are used, repetitive treatments should be applied as needed to control dust.

SECTION 4: CONTROL MEASURE INSTALLATION, INSPECTION, and MAINTENANCE

4.1 Installation

Per RI SESC Handbook – Part D:

Complete the installation of temporary erosion, runoff, sediment, and pollution prevention control measures by the time each phase of earth-disturbance has begun. All stormwater control measures must be installed in accordance with good judgment, including applicable design and manufacturer specifications. Installation techniques and maintenance requirements may be found in manufacturer specifications and/or the *RI SESC Handbook*.

Erosion control measures shall be located per sheet C1.8.

4.2 Monitoring Weather Conditions

Per RI SESC Handbook – Part D:

Anticipating Weather Events - Care will be taken to the best of the operator's ability to avoid disturbing large areas prior to anticipated precipitation events. Weather forecasts must be routinely checked, and in the case of an expected precipitation event of over 0.25-inches over a 24-hour period, it is highly recommended that all control measures should be evaluated and maintained as necessary, prior to the weather event. In the case of an extreme weather forecast (greater than one-inch of rain over a 24-hour period), additional erosion/sediment controls may need to be installed.

Storm Event Monitoring For Inspections - At a minimum, storm events must be monitored and tracked in order to determine when post-storm event inspections must be conducted. Inspections must be conducted and documented at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event, which generates at least 0.25 inches of rainfall per twenty-four (24) hour period and/or after a significant amount of runoff or snowmelt.

In order for an operator to successfully satisfy this requirement list the weather gauge station that will be utilized to monitor weather conditions on the construction site. See www.wunderground.com or www.weather.gov for available stations.

The weather gauge station and website that will be utilized to monitor weather conditions on the construction site is as follows:

- Beaver River Inn (ID KRIRICHM4)
  https://www.wunderground.com/q/zmw:02892.8.99999

4.3 Inspections

Per RI SESC Handbook – Part D:

Minimum Frequency - Each of the following areas must be inspected by or under the supervision of the owner and operator at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event, which generates at least 0.25 inches of rainfall per twenty-four (24) hour period and/or after a significant amount of runoff or snowmelt:

a. All areas that have been cleared, graded, or excavated and where permanent stabilization has not been achieved;

b. All stormwater erosion, runoff, and sediment control measures (including pollution prevention control measures) installed at the site;

c. Construction material, unstabilized soil stockpiles, waste, borrow, or equipment storage, and maintenance areas that are covered by this permit and are exposed to precipitation;

d. All areas where stormwater typically flows within the site, including temporary drainage ways designed to divert, convey, and/or treat stormwater;

e. All points of discharge from the site;

f. All locations where temporary soil stabilization measures have been implemented;

g. All locations where vehicles enter or exit the site.

Reductions in Inspection Frequency - If earth disturbing activities are suspended due to frozen conditions, inspections may be reduced to a frequency of once per month. The owner and operator must document the beginning and ending dates of these periods in an inspection report.

Qualified Personnel – The site owner and operator are responsible for designating personnel to conduct inspections and for ensuring that the personnel who are responsible for conducting the inspections are "qualified" to do so. A "qualified person" is a person knowledgeable in the principles and practices of erosion, runoff, sediment, and pollution prevention controls, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of the permit.

Recordkeeping Requirements - All records of inspections, including records of maintenance and corrective actions must be maintained with the SESC Plan. Inspection records must include the date and time of the inspection, and the inspector's name, signature, and contact information.

General Notes

- A separate inspection report will be prepared for each inspection.
- The Inspection Reference Number shall be a combination of the RIPDES Construction General Permit No - consecutively numbered inspections. ex/ Inspection reference number for the **4**th inspection of a project would be: RIR10#####-**4**
- Each report will be signed and dated by the Inspector and must be kept onsite.
- Each report will be signed and dated by the Site Operator.
- The corrective action log contained in each inspection report must be completed, signed, and dated by the site operator once all necessary repairs have been completed.
- It is the responsibility of the site operator to maintain a copy of the SESC Plan, copies of all completed inspection reports, and amendments as part of the SESC Plan documentation at the site during construction.

Failure to make and provide documentation of inspections and corrective actions under this part constitutes a violation of your permit and enforcement actions under 46-12 of R.I. General Laws may result.

4.4 Maintenance

Per RI SESC Handbook – Part D:

Maintenance procedures for erosion and sedimentation controls and stormwater management structures/facilities are described on the SESC Site Plans and in the *RI SESC Handbook*.

Site owners and operators must ensure that all erosion, runoff, sediment, and pollution prevention controls remain in effective operating condition and are protected from activities that would reduce their effectiveness. Erosion, runoff, sedimentation, and pollution prevention control measures must be maintained throughout the course of the project.

Note: It is recommended that the site operator designates a full-time, on-site contact person responsible for working with the site owner to resolve SESC Plan-related issues.

4.5 Corrective Actions

Per RI SESC Handbook – Part D:

If, in the opinion of the designated site inspector, corrective action is required, the inspector shall note it on the inspection report and shall inform the site operator that corrective action is necessary. The site operator must make all necessary repairs whenever maintenance of any of the control measures instituted at the site is required.

In accordance with the *RI SESC Handbook*, the site operator shall initiate work to fix the problem immediately after its discovery, and complete such work by the close of the next work day, if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.

When installation of a new control or a significant repair is needed, site owners and operators must ensure that the new or modified control measure is installed and made operational by no later than seven (7) calendar days from the time of discovery where feasible. If it is infeasible to complete the installation or repair within seven (7) calendar days, the reasons why it is infeasible must be documented in the SESC Plan along with the schedule for installing the control measures and making it operational as soon as practicable after the 7-day timeframe. Such documentation of these maintenance procedures and timeframes should be described in the inspection report in which the issue was first documented. If these actions result in changes to any of the control measures outlined in the SESC Plan, site owners and operators must also modify the SESC Plan accordingly within seven (7) calendar days of completing this work.

SECTION 5: AMENDMENTS

Per RIPDES Construction General Permit – Part III.F:

This SESC Plan is intended to be a working document. It is expected that amendments will be required throughout the active construction phase of the project. **Even if practices are installed on a site according to the approved plan, the site is only in compliance when erosion, runoff, and sedimentation are effectively controlled throughout the entire site for the entire duration of the project.**

The SESC Plan shall be amended within seven (7) days whenever there is a change in design, construction, operation, maintenance or other procedure which has a significant effect on the potential for the discharge of pollutants, or if the SESC Plan proves to be ineffective in achieving its objectives (i.e. the selected control measures are not effective in controlling erosion or sedimentation).

In addition, the SESC Plan shall be amended to identify any new operator that will implement a component of the SESC Plan.

All revisions must be recorded in the Record of Amendments Log Sheet, which is contained in Attachment G of this SESC Plan, and dated red-lined drawings and/or a detailed written description must be appended to the SESC Plan. Inspection Forms must be revised to reflect all amendments. Update the Revision Date and the Version # in the footer of the Report to reflect amendments made.

All SESC Plan Amendments, except minor non-technical revisions, must be approved by the site owner and operator. Any amendments to control measures that involve the practice of engineering must be reviewed, signed, and stamped by a Professional Engineer registered in the State of RI.

The amended SESC plan must be kept on file at the site while construction is ongoing and any modifications must be documented.

Attach a copy of the Amendment Log.

Reference RI Model SESC Plan ATTACHMENT G

SECTION 6: RECORDKEEPING

RIPDES Construction General Permit – Parts III.D, III.G, III.J.3.b.iii, & V.O

It is the site owner and site operator's responsibility to have the following documents available at the construction site and immediately available for RIDEM review upon request:

- A copy of the fully signed and dated SESC Plan, which includes:
  - A copy of the General Location Map
    INCLUDED AS ATTACHMENT A
  - A copy of all SESC Site Plans
    INCLUDED AS ATTACHMENT B
  - A copy of the RIPDES Construction General Permit *(To save paper and file space, do not include in DEM/CRMC submittal, for operator copy only)*
    INCLUDED AS ATTACHMENT C
  - A copy of any regulatory permits (RIDEM Freshwater Wetlands Permit, CRMC Assent, RIDEM Water Quality Certification, RIDEM Groundwater Discharge Permit, RIDEM RIPDES Construction General Permit authorization letter, etc.)
    INCLUDED AS ATTACHMENT D
  - The signed and certified NOI form or permit application form *(if required as part of the application, see RIPDES Construction General Permit for applicability)*
    INCLUDED AS ATTACHMENT E
  - Completed Inspection Reports w/Completed Corrective Action Logs
    INCLUDED AS ATTACHMENT F
  - SESC Plan Amendment Log
    INCLUDED AS ATTACHMENT G

SECTION 7: PARTY CERTIFICATIONS

RIPDES Construction General Permit – Part V.G

All parties working at the project site are required to comply with the Soil Erosion and Sediment Control Plan (SESC Plan including SESC Site Plans) for any work that is performed on-site. The site owner, site operator, contractors and sub-contractors are encouraged to advise all employees working on this project of the requirements of the SESC Plan. A copy of the SESC Plan is available for your review at the following location: Insert Onsite Location Here, or may be obtained by contacting the site owner or site operator.

The site owner and site operator and each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement.

I acknowledge that I have read and understand the terms and conditions of the Soil Erosion and Sediment Control (SESC) Plan for the above designated project and agree to follow the control measures described in the SESC Plan and SESC Site Plans.

Site Owner:

William M. Stamp Jr, Trustee
One Stamp Place
Exeter, RI 02882
401-742-4454; stamp866@verizon.net

_____
signature/date

Site Operator:

Green Development, LLC
Paul Correia
3760 Quaker Lane
North Kingstown, RI 02852
401-295-4998; md@green-ri.com

_____
signature/date

Designated Site Inspector:

Green Development, LLC
Paul Correia
3760 Quaker Lane
North Kingstown, RI 02852
401-295-4998; pc@green-ri.com

_____
signature/date

SESC Plan Contact:

Green Development, LLC
Kevin Morin, PE
3760 Quaker Lane
North Kingstown, RI 02852
401-295-4998; km@green-ri.com

_____
signature/date

LIST OF ATTACHMENTS

Attachment A - General Location Map

Attachment B - SESC Site Plans

Attachment C - Inspection Reports w/ Corrective Action Log

Attachment D - SESC Plan Amendment Log

Attachment E – Diversion Swale & Sediment Trap Calculations

Attachment A - General Location Map

See Plans prepared by Green Development, LLC

Attachment B - SESC Site Plans

See Plans prepared by Green Development, LLC

Attachment C - Inspection Reports w/ Corrective Action Log

SESC Plan Inspection Report

Project Information			
Name			
Location			
DEM Permit No.			
Site Owner	**Name**	**Phone**	**Email**
Site Operator	**Name**	**Phone**	**Email**

Inspection Information			
Inspector Name	**Name**	**Phone**	**Email**
Inspection Date		**Start/End Time**	
Inspection Type ❑ **Weekly** ❑ **Pre-storm event** ❑ **During storm event** ❑ **Post-storm event** ❑ **Other**			

Weather Information
Last Rain Event **Date:** **Duration (hrs):** **Approximate Rainfall (in):**
Rain Gauge Location & Source:
Weather at time of this inspection:

Check statement that applies then sign and date below:

☐ **I, as the designated Inspector, certify that this site has been inspected as required by regulation and I have determined that maintenance and corrective actions are not required at this time.**

☐ **I, as the designated Inspector, certify that this site has been inspected as required by regulation and I have made the determination that the site requires corrective actions. The required corrective actions are noted within this inspection report.**

	Print Name	**Signature**	**Date**
Inspector:			

The Site Operator acknowledges by his/her signature, the receipt of this SESC Plan inspection report and its findings. He/she acknowledges that all recommended corrective actions must be completed and documentation of all such corrective actions must be made in this inspection report per applicable regulations.

	Print Name	**Signature**	**Date**
Operator:			

Site-specific Control Measures

Number the structural and non-structural stormwater control measures identified in the SESC Plan and on the SESC Site Plans and list them below (add as necessary). Bring a copy of this inspection form and any applicable SESC Site Plans with you during your inspections. This list will assist you to inspect all control measures at your site.
FILL THIS TABLE USING THE SESC PLAN TABLES 2.11 & 3.12.

	Location/Station	Control Measure Description	Installed & Operating Properly?	Assoc. Photo/ Figure #	Corrective Action Needed (Yes or No; if 'Yes', please detail action required)
1	Example 1: Eastern Parcel – Slope No. 4 Adjacent to I-95. Straw Wattles	Straw Wattle. Section Six, Sediment Control Measures, Straw Wattles, Compost Tubes and Fiber Rolls - *RI SESC Handbook*.	❑Yes ❑No		
2	Example 2: Western Parcel – Green Street Construction Entrance	Stone Stabilized Pad. Section Six: Sediment Control Measures – Construction Entrances –*RI SESC Handbook*.	❑Yes ❑No		
3	Example 3: Hospital Main Footings – Excavation Area – SESC Site Plan Sheet No. 3.	Pump Intake Protection Using Stone Filled Sump with Standpipe. Section Six: Sediment Control Measures, Pump Intake Protection, *RI SESC Handbook.*	❑Yes ❑No		
4	Example 4: Bridge Abutment Construction Southbound Bridge Abutment, Bridge No. 244 – SESC Site Plan Sheet No. 18.	Prefabricated Concrete Washout Container with Ramp. Used to contain concrete washout during concrete pouring operations. Section Three: Pollution Prevention and Good Housekeeping, Concrete Washouts, *RI SESC Handbook*.	❑Yes ❑No		
5	INSERT TEXT	INSERT TEXT	❑Yes ❑No		
6	**Attention Operator:**	**You must modify this inspection form as the project progresses, control measure locations change, and amendments to the SESC Plan are instituted in the field.**	❑Yes ❑No		
7			❑Yes ❑No		
8			❑Yes ❑No		

	Location/Station	Control Measure Description	Installed & Operating Properly?	Assoc. Photo/ Figure #	Corrective Action Needed (Yes or No; if 'Yes', please detail action required)
9			❑Yes ❑No		
10			❑Yes ❑No		
11			❑Yes ❑No		
12			❑Yes ❑No		
13			❑Yes ❑No		
14			❑Yes ❑No		
15			❑Yes ❑No		
16			❑Yes ❑No		
17			❑Yes ❑No		
18			❑Yes ❑No		
19			❑Yes ❑No		
20			❑Yes ❑No		
21			❑Yes ❑No		
22			❑Yes ❑No		
23			❑Yes ❑No		
24			❑Yes ❑No		

	Location/Station	Control Measure Description	Installed & Operating Properly?	Assoc. Photo/ Figure #	Corrective Action Needed (Yes or No; if 'Yes', please detail action required)
25			❑Yes ❑No		
26			❑Yes ❑No		
27			❑Yes ❑No		
28			❑Yes ❑No		
29			❑Yes ❑No		
30			❑Yes ❑No		

(add more as necessary)

General Site Issues

*Below are some general site issues that should be assessed during inspections. Please **customize** this list as needed for conditions at the site.*

	Compliance Question		Assoc. Photo/ Figure #	Corrective Action Needed (If 'Yes', please detail action required and include location/station)
1	Have all control measures been installed as specified in the RISESC Handbook and prior to any earth disturbing activities?	❑Yes ❑No ❑ N/A		
2	Are appropriate limits of disturbance (LOD) established?	❑Yes ❑No ❑ N/A		
3	Are controls that limit runoff from exposed soils by diverting, retaining, or detaining flows (such as check dams, sediment basins, etc.) in place?	❑Yes ❑No ❑ N/A		
4	Are all temporary conveyance practices installed correctly and functioning as designed?	❑Yes ❑No ❑ N/A		
5	Has maintenance been performed as required to ensure continued proper function of all temporary conveyances practices?	❑Yes ❑No ❑ N/A		
6	Were all exposed soils seeded by October 15th?	❑Yes ❑No ❑ N/A		
7	Have soils been stabilized where earth disturbance activities have permanently or temporarily ceased on any portion of the site and will not resume for more than 14 days?	❑Yes ❑No ❑ N/A		
8	In instances where adequate vegetative stabilization was not established by November 15th, have non-vegetative erosion control measures must be employed?	❑Yes ❑No ❑ N/A		
9	If work is to continue from October 15th through April 15th, are steps taken to ensure that only the day's work area will be exposed and all erodible soil is stabilized within 5 working days?	❑Yes ❑No ❑ N/A		
10	Have inlet protection measures (such as fabric drop inlet protection, curb drop inlet protection, etc.) been properly installed?	❑Yes ❑No ❑ N/A		
11	Has the operator cleaned and maintained inlet protection measures when needed?	❑Yes ❑No ❑ N/A		
12	Has the operator removed accumulated sediment adjacent to inlet protection measures within 24 hours of detection?	❑Yes ❑No ❑ N/A		

	Compliance Question		**Assoc. Photo/ Figure #**	**Corrective Action Needed (If 'Yes', please detail action required and include location/station)**
13	Has the operator properly installed outlet protection (such as riprap, turf mats, etc.) at all temporary and permanent discharge points?	❑Yes ❑No ❑ N/A		
14	Are all outlet protection measures functioning properly in order to reduce discharge velocity, promote infiltration, and eliminate scour?	❑Yes ❑No ❑ N/A		
15	Have all discharge points been inspected to ensure the prevention of scouring and channel erosion?	❑Yes ❑No ❑ N/A		
16	Have sediment controls been installed along perimeter areas that will receive stormwater from earth disturbing activities?	❑Yes ❑No ❑ N/A		
17	Is the operator maintaining sediment controls in accordance with the requirements in the *RI SESC Handbook*?	❑Yes ❑No ❑ N/A		
18	Have temporary sediment barriers been installed around permanent infiltration areas (such as bioretention areas, infiltration basins, etc.)?	❑Yes ❑No ❑ N/A		
19	Have staging areas and equipment routing been implemented to avoid compaction where permanent infiltration areas will be located?	❑Yes ❑No ❑ N/A		
20	Are surface outlet structures (such as skimmers, siphons, etc.) installed for each temporary sediment basin? [Exception: frozen conditions]	❑Yes ❑No ❑ N/A		
21	Have all temporary sediment basins or traps been inspected and maintained as required to ensure proper function?	❑Yes ❑No ❑ N/A		
22	Does the project include the use of polymers, flocculants, or other chemicals to control erosion, sedimentation, or runoff from the site?	❑Yes ❑No ❑ N/A		
23	Are all chemicals being managed in accordance with Appendix J of the *RISESC Handbook* and current best management practices?	❑Yes ❑No ❑ N/A		
24	Has the site operator taken steps to **prohibit** the following pollutant discharges on the site?			
a	Contaminated groundwater.	❑Yes ❑No ❑ N/A		

	Compliance Question		**Assoc. Photo/ Figure #**	**Corrective Action Needed (If 'Yes', please detail action required and include location/station)**
b	Wastewater from washout of concrete; unless properly contained, managed, and disposed of.	❑Yes ❑No ❑ N/A		
c	Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction products.	❑Yes ❑No ❑ N/A		
d	Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.	❑Yes ❑No ❑ N/A		
e	Soaps or solvents used in vehicle and equipment washing.	❑Yes ❑No ❑ N/A		
f	Toxic or hazardous substances from a spill or other release.	❑Yes ❑No ❑ N/A		
25	Is the operator using properly constructed entrances/exits to the site so sediment removal occurs prior to vehicles exiting?	❑Yes ❑No ❑ N/A		
26	If needed, are additional controls (such as rumble strips, rattle plates, etc.) in place to remove sediment from tires prior to exiting?	❑Yes ❑No ❑ N/A		
27	Is sediment track-out being removed by the end of the same workday in which it occurs (via sweeping, shoveling, or vacuuming)?	❑Yes ❑No ❑ N/A		
28	Are all wastes generated at the site being managed and properly disposed of by the end of each workday?	❑Yes ❑No ❑ N/A		
29	Are all chemicals and hazardous waste materials stored properly in covered areas and surrounded by containment control systems?	❑Yes ❑No ❑ N/A		
30	Has the operator established highly visible locations for the storage of spill prevention and control equipment on the construction site?	❑Yes ❑No ❑ N/A		
31	Are allowable non-stormwater discharges being managed properly with adequate controls?	❑Yes ❑No ❑ N/A		
32	Is the site operator properly managing groundwater or stormwater that is removed from excavations, trenches, or similar points of accumulation?	❑Yes ❑No ❑ N/A		
33	Are proper procedures and controls in place for the storage of materials that may discharge pollutants if	❑Yes ❑No ❑ N/A		

	Compliance Question		**Assoc. Photo/ Figure #**	**Corrective Action Needed (If 'Yes', please detail action required and include location/station)**
	exposed to stormwater?			
	Are stockpiles located within the limits of disturbance?	❑Yes ❑No ❑ N/A		
	Are stockpiles being protected from contact with stormwater using a temporary sediment barrier?	❑Yes ❑No ❑ N/A		
	Where needed, has cover or appropriate temporary vegetative or structural stabilization been utilized for stockpiles?	❑Yes ❑No ❑ N/A		
	Is the operator effectively managing the generation of dust through the use of water, chemicals, or minimization of exposed soil?	❑Yes ❑No ❑ N/A		
	Are designated washout areas (such as wheel washing stations, washout for concrete, paint, stucco, etc.) clearly marked on the site?	❑Yes ❑No ❑ N/A		
	Are vehicle fueling and maintenance areas properly located to prevent pollutants from impacting stormwater and sensitive receptors?	❑Yes ❑No ❑ N/A		
	(Other)			

(add more as necessary)

General Field Comments:

Attachment D - SESC Plan Amendment Log

Photos:

(Associated photos – each photo should be dated and have a unique identification # and written description indicating where it is located within the project area. If a close up photo is required, it should be preceded with a photo including both the detail area and some type of visible fixed reference point. Photos should be annotated with Station numbers and other identifying information where needed.)

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

(add more as necessary)

Corrective Action Log

TO BE FILLED OUT BY SITE OPERATOR

Describe repair, replacement, and maintenance of control measures, actions taken, date completed, and note the person that completed the work.

	Location/Station	Corrective Action	Date Completed	Person Responsible
Operator Signature:			**Date:**	

Attachment E – Diversion Swale & Sediment Trap Calculations

TEMPORARY SEDIMENT TRAP CALCULATIONS

Applicability: Use Temporary Sediment Traps for disturbed areas where the contributing drainage area is 5 acres or less.
Refer to the Rhode Island Soil Erosion Control Handbook - Section Six: Sediment Control Measures - Temporary Sediment Traps

GREEN development, LLC

3760 Quaker Lane
North Kingstown, RI 02858
(401) 295-4998
www.green-ri.com

Sediment Trap # 3

Drainage Area (DA) = 4.891 Acres

Required Sediment Storage Volume Calculation; V= DA x 1"
(RISDISM Standard 10 V = **17,754 cu.ft.**
Requires 1" runoff Volume)

Wet Storage Volume Calculation; Vw= 0.85 x Aw x Dw
Vw= 8,884 cu.ft.
Wet Storage Volume Check = Vw > 0.5 V Ok

Dry Storage Volume Calculation; Vd= [(Aw + Ad)/2] * Dd
Vd= 11,161 cu.ft.

Provided Sediment Storage Volume **V= 20,045 cu.ft.**

Sediment Trap Details

	Abbr	Value	Unit
Wet Storage Depth	Dw	1.0	feet
Dry Storage Depth	Dd	1.0	feet
Total Depth	D	2.0	feet
Bottom of Trap Area	Ab	9,060	sq.ft
Wetted Surface Area	Aw	10,452	sq.ft
Surface Area at Outlet	Ad	11,869	sq.ft

Sediment Trap # 4

Drainage Area (DA) = 4.984 Acres

Required Sediment Storage Volume Calculation; V= DA x 1"
(RISDISM Standard 10 V = **18,092 cu.ft.**
Requires 1" runoff Volume)

Wet Storage Volume Calculation; Vw= 0.85 x Aw x Dw
Vw= 9,092 cu.ft.
Wet Storage Volume Check = Vw > 0.5 V Ok

Dry Storage Volume Calculation; Vd= [(Aw + Ad)/2] * Dd
Vd= 11,235 cu.ft.

Provided Sediment Storage Volume **V= 20,327 cu.ft.**

Sediment Trap Details

	Abbr	Value	Unit
Wet Storage Depth	Dw	1.0	feet
Dry Storage Depth	Dd	1.0	feet
Total Depth	D	2.0	feet
Bottom of Trap Area	Ab	9,645	sq.ft
Wetted Surface Area	Aw	10,697	sq.ft
Surface Area at Outlet	Ad	11,773	sq.ft

TEMPORARY SEDIMENT TRAP CALCULATIONS

Applicability: Use Temporary Sediment Traps for disturbed areas where the contributing drainage area is 5 acres or less.
Refer to the Rhode Island Soil Erosion Control Handbook - Section Six: Sediment Control Measures - Temporary Sediment Traps

GREEN development, LLC

3760 Quaker Lane
North Kingstown, RI 02858
(401) 295-4998
www.green-ri.com

Sediment Trap # 5

Drainage Area (DA) = 2.753 Acres

Required Sediment Storage Volume Calculation; V= DA x 1"
(RISDISM Standard 10 V = **9,993 cu.ft.**
Requires 1" runoff Volume)

Wet Storage Volume Calculation; Vw= 0.85 x Aw x Dw
Vw= 5,009 cu.ft.
Wet Storage Volume Check = Vw > 0.5 V Ok

Dry Storage Volume Calculation; Vd= [(Aw + Ad)/2] * Dd
Vd= 6,233 cu.ft.

Provided Sediment Storage Volume **V= 11,242 cu.ft.**

Sediment Trap Details

	Abbr	Value	Unit
Wet Storage Depth	Dw	1.0	feet
Dry Storage Depth	Dd	1.0	feet
Total Depth	D	2.0	feet
Bottom of Trap Area	Ab	5,239	sq.ft
Wetted Surface Area	Aw	5,893	sq.ft
Surface Area at Outlet	Ad	6,572	sq.ft

Sediment Trap # 6

Drainage Area (DA) = 3.694 Acres

Required Sediment Storage Volume Calculation; V= DA x 1"
(RISDISM Standard 10 V = **13,409 cu.ft.**
Requires 1" runoff Volume)

Wet Storage Volume Calculation; Vw= 0.85 x Aw x Dw
Vw= 6,716 cu.ft.
Wet Storage Volume Check = Vw > 0.5 V Ok

Dry Storage Volume Calculation; Vd= [(Aw + Ad)/2] * Dd
Vd= 8,272 cu.ft.

Provided Sediment Storage Volume **V= 14,988 cu.ft.**

Sediment Trap Details

	Abbr	Value	Unit
Wet Storage Depth	Dw	1.0	feet
Dry Storage Depth	Dd	1.0	feet
Total Depth	D	2	feet
Bottom of Trap Area	Ab	7,184	sq.ft
Wetted Surface Area	Aw	7,901	sq.ft
Surface Area at Outlet	Ad	8,643	sq.ft

Stormwater Management Report

April 2018

Project Name: GD Richmond Beaver River I

Project Location: 172 Beaver River Road, Richmond, RI 02812
Applicant: GD Richmond Beaver River I LLC, 3760 Quaker Ln, North Kingstown, RI 02852
Owner: William M. Stamp Jr, Trustee, One Stamp Place, Exeter, RI 02882

Table of Contents

Executive Summary

The purpose of this report is to document drainage calculations and compliance with the Rhode Island Stormwater Design and Installation Standards Manual for the proposed project located in Richmond, Rhode Island. The project is located at 172 Beaver River Road in Richmond, Rhode Island on Assessor's Plat 8E Lot 12. The site is occupied by an existing single-family home, shed and agricultural fields primarily farmed for corn. The project proposes to demolish the existing home and shed, convert the existing agricultural field to a solar facility by removing the crops, seeding the already cleared field and installing the solar array shown on the plans associated with this report. No woodland or wetlands will be altered by this project. The limit of disturbance is proposed within the existing cleared area.

The existing agricultural areas that are farmed for crops during the growing season and fallow for the remainder of the year to hay/pasture land are proposed to be removed entirely and grass seed applied in and around the entire solar array field to improve the runoff conditions from pre-development to post-development. The primary focus will be to capture sediments during the transition from farm to solar with temporary sediment traps and to limit the disturbance required for the installation of the solar field.

The nature of the solar field requires no proposed grading except for trenching of underground utility connections and temporary soil erosion and sediment control measures.

This report details how the site will show no net increase in stormwater runoff from pre-development to post development conditions, and how the proposed BMP's will provide water quality treatment during construction.

Below is a summary of pre-development and post-development conditions for the watershed:

Conditions	1 Year Storm Event	10 Year Storm Event	100 Year Storm Event
Pre Development Flow (cfs) Volume (af)	 19.23 cfs 2.474 af	 58.70 cfs 7.037 af	 136.61 cfs 16.327 af
Post Development Flow (cfs) Volume (af)	 2.89 cfs 0.707 cfs	 25.62 cfs 3.500 af	 88.10 cfs 10.684 af
Net Change Flow (cfs) Volume (af)	 -16.34 cfs -1.767 af	 -33.08 cfs -3.537 af	 -48.51 cfs -5.643 af

Note: cfs = cubic feet per second | af = acre feet

1.0 Project Description and Site Conditions

1.1 Project Description

The project is located at 172 Beaver River Road and is located on Assessor's Plat 8E Lot 12. The subject property is 41.76 acres. The site is currently zones R-3, Residential with a 3-acre lot minimum. The site is occupied by an existing single-family home, shed and agricultural fields primarily farmed for corn. The project proposes to demolish the existing home and shed, convert the existing agricultural field to a solar facility by removing the crops, seeding the already cleared field and installing the solar array shown on the plans associated with this report. No woodland or wetlands will be altered by this project. The limit of disturbance is proposed within the existing cleared area.

The existing agricultural areas that are farmed for crops during the growing season and fallow for the remainder of the year to hay/pasture land are proposed to be removed entirely and grass seed applied in and around the entire solar array field to improve the runoff conditions from pre-development to post-development. The primary focus will be to capture sediments during the transition from farm to solar with temporary sediment traps and to limit the disturbance required for the installation of the solar field.

The nature of the solar field requires no proposed grading except for trenching of underground utility connections and temporary soil erosion and sediment control measures.

1.2 Existing Site Conditions

The site is comprised of an existing single-family home and shed located in very close proximity to Beaver River Road. The dominant use of the site is agricultural fields that are used primarily for corn production. There is no drainage system in or around the area of the Site or Beaver River Road and stormwater flows predominantly from north to south/southeast across the agricultural field toward the Beaver River via sheet flow. Beaver River Road abuts the site to the west. Beaver River abuts the site to the east. The site is surrounded by a mixture of farm land and residential homes. The existing topography will not be altered in the area of the solar array and no soils are proposed to be removed from the site.

1.3 Proposed Site Conditions

The proposed use of the site is for the installation of a 5.25 MW (AC) solar array field in the area of the existing agricultural field. The existing agricultural areas that are farmed for crops during the growing season and fallow for the remainder of the year to hay/pasture land are proposed to be removed entirely and grass seed applied in and around the entire solar array field to improve the runoff conditions from pre-development to post-development. The primary focus for Best Management Practices incorporated into the site design will be to capture sediments during the transition from farm to solar with temporary sediment traps and to limit the disturbance required for the installation of the solar field.

1.4 Soils

The following section summarizes the soil types and hydrologic group for this property. The soils are shown on the site plans and are taken from the Soil Survey of RI (USDA NRCS) and available RIGIS mapping.

Soil Symbol	Hydrologic Soil Group	Description
Afa	B	Agawam fine sandy loam, 0 to 3 percent slopes
EfA	B	Enfield silt loam, 0 to 3 percent slopes
EfB	B	Enfield silt loam, 3 to 8 percent slopes
HkA	A	Hinckley gravelly sandy loam, 0 to 3 percent slopes
HkC	A	Hinckley gravelly sandy loam, rolling
Nt	B	Ninigret fine sandy loam
Ss	B	Sudbury sandy loam
Wa	C	Walpole sandy loam

2.0 RI Stormwater Design and Installation Standards Manual Compliance

The following sections outline how the proposed design complies with the minimum standards of the Rhode Island Stormwater Design and Installation Standards Manual (RISDISM) as amended.

2.1 Standard 1: Low Impact Development Assessment

The site is intensely utilized as farm fields for row crops and the conversion of row crops during summer and fallow fields outside the crowing season to grass/ meadow/hay results in greater ground surface cover and a reduction in runoff from pre-development to post-development. The low maintenance future condition will require less fertilization, watering, and pesticides than under current conditions.

This future condition will also provide greater ground cover thereby reducing sediment runoff. There will be a net decrease in impervious coverage with the removal of the existing home and the use of pervious driveways to allow for periodic maintenance visits and inspections. The existing drainage patters are proposed to remain, and minimal grading is proposed except for temporary soil erosion measures.

Ultimately, Beaver River and its associated wetlands will be protected from other types of development that could occur on this property. See also Appendix A: Stormwater Management Checklist and LID Planning Report.

2.2 Standard 2: Groundwater Recharge

The requirement for recharge is based on the impervious coverage of the site and associated recharge factors based on Hydrologic Soil Group's per RISDISM Table 3-4 as outlined below:

Hydrologic Soil Group A – Recharge Factor (F) = 0.60
Hydrologic Soil Group B – Recharge Factor (F) = 0.35
Hydrologic Soil Group C – Recharge Factor (F) = 0.25
Hydrologic Soil Group D – Recharge Factor (F) = 0.10

The recharge requirements are calculated as follows:

Re_v= (1")(F)(I)/12

Where Re_v= groundwater recharge volume (ac-ft)

F= Recharge Factor (per Table 3-4 of the RISDISM)

I = impervious area (acres)

The impervious coverage of the Site is negligible. There is no increase of impervious area from pre-development to post-development. The removal of the existing house and shed (0.042 acres) from pre-development to the installation of the inverter concrete pads (0.042 acres) in post-development result in a net increase of 0.00 acres. The minimal amount of impervious area is negligible regarding the overall site of 41.76 acres.

The ReV for the equipment pads is: Re_v= (1")(F)(I)/12 = (1")(.35)(.042)/12 = 0.00123 ac-ft.

Applying the recharge credit of 0.004 ac-ft results in a net recharge requirement of 0.0083 ac-ft or 36 cubic feet.

The transition from row crops to grass will allow groundwater recharge to naturally occur over the site without the use of BMP's. The impervious equipment pads drain toward the permeable stone access driveway where recharge is expected to occur.

2.3 Standard 3: Water Quality

This redevelopment in the site results in no increase in impervious surface from pre-development to post-development conditions. They conversion of active agricultural fields to a permanent cover with grass/pasture/hay results in a decrease in runoff from pre-development to post-development conditions.

The water quality volume calculated for concrete equipment pads is as follows:

WQ_v= (1")(I)/12 where I is impervious area in acres

WQ_v = (1)(.042)/12 = 0.0035 ac-ft

Applying the recharge credit of 0.004 ac-ft results in a net water quality volume of 0.0027 ac-ft or 117 cubic feet.

Conditions	1.2" WQv Storm Event
Pre Development Flow (cfs) Volume (af)	 0.66 cfs 0.222 af
Post Development Flow (cfs) Volume (af)	 0.03 cfs 0.003 cfs
Net Change Flow (cfs) Volume (af)	 -0.63 cfs -0.219 af

Note: cfs = cubic feet per second | af = acre feet

The transition from row crops to grass will allow groundwater recharge to naturally occur over the site without the use of BMP's. The impervious equipment pads drain toward the permeable stone access driveway where the water quality volume can be attenuated.

2.4 Standard 4: Conveyance and Natural Channel Protection

The site design does not propose any pipe networks associated with this project. Because the site is defined as a small facility with impervious cover less than or equal to an acre (.042 acres) the channel protection volume requirement is waived in accordance with RISDISM 3.3.4.

2.5 Standard 5: Overbank Flood Protection

The overbank flood protection (Qp) is addressed in this section based on an analysis of the pre-development and post-development watershed based on 1-year, 10-year, and 100-year storms.

TR-20 (Technical Release Number 20) from the USDA Soil Conservation Service Method was used to determine the stormwater runoff rate and volume. Type III rainfall distribution is utilized. TR-55 (Technical Release Number 55) methodology was used to determine time of concentration. HydroCAD ver. 10.00-21 by Applied Microcomputer Systems was used to model pre-development and post-development conditions.

2.5.1 Design Storm

Analysis of the pre-development and post-development watershed based on 1-year, 10-year, and 100-year storms are included below. The Rhode Island Stormwater Design and Installation Standards Manual states that for a 24-hour rainfall intensity found in Table 3-1 for Washington County is as follows:

1 year = 2.8 inches
10 year= 4.9 inches
100 year= 8.5 inches

2.5.2 Subcatchment Breakdown

The site has been analyzed as one watershed area. The existing agricultural areas that are farmed for crops during the growing season and fallow for the remainder of the year are proposed to be removed entirely and grass seed applied in and around the entire solar array field to improve the runoff conditions from pre-development to post-development. The agricultural field areas outside the solar project limit will be planted as hay/pasture to provide permanent cover. A description of each watershed is provided below.

Design Line DL-1 - Wetland 100-127 & 200-268:

This watershed flows to Design Line - 1 (DL-1). This watershed consists of the entire site and a small off-site portion that runs parallel with Beaver River Road. The design line is the existing surveyed wetland to the east of the site which includes Beaver River. The existing site grades sheet flow overland from north/northwest to south/southeast.

In Pre Development conditions (100) the area consists of an existing house, shed, row crops and wooded wetlands. The stormwater runs via overland flow towards the existing wetland.

In Post Development conditions (200) the area consists of grass, gravel access road, the proposed solar field and wooded wetlands. The stormwater runs via overland flow towards the existing wetland.

This future condition will also provide greater ground cover thereby reducing sediment runoff. There will be a net decrease in impervious coverage with the removal of the existing home and the use of pervious driveways to allow for periodic maintenance visits and inspections. The existing drainage patters are proposed to remain, and minimal grading is proposed except for temporary soil erosion measures.

Ultimately, Beaver River and its associated wetlands will be protected from other types of development that could occur on this property.

The table below summarizes the hydrologic parameters for the pre development and post development areas for Design Line-1.

	Area (acres)	CN	Tc (min)
Pre Development (100)	35.655 acres	75	26.5 mins
Post Development (200)	35.655 acres	59	26.5 mins

2.5.3 Downstream Analysis

Under the following conditions a downstream analysis is required:

Area of Disturbance (Acres)	Impervious Cover (%)
>5 to 10	>75
>10 to 25	>50
>25 to 50	>25
>50	All Projects

The proposed project disturbs 31.18+/- acres and is 0 acres of impervious. A downstream analysis is not required.

2.5.4 Overbank Flood Protection Conclusion

Below is a summary of pre-development and post-development conditions for the watershed:

Conditions	1 Year Storm Event	10 Year Storm Event	100 Year Storm Event
Pre Development Flow (cfs) Volume (af)	 19.23 cfs 2.474 af	 58.70 cfs 7.037 af	 136.61 cfs 16.327 af
Post Development Flow (cfs) Volume (af)	 2.89 cfs 0.707 cfs	 25.62 cfs 3.500 af	 88.10 cfs 10.684 af
Net Change Flow (cfs) Volume (af)	 -16.34 cfs -1.767 af	 -33.08 cfs -3.537 af	 -48.51 cfs -5.643 af

Note: cfs = cubic feet per second | af = acre feet

2.6 Standard 6: Redevelopment and Infill Projects

The site is not considered a redevelopment or infill project.

2.7 Standard 7: Pollution Prevention

A separate report entitled “Soil Erosion and Sediment Control Plan for GD Richmond Beaver River I” provides compliance with this Standard. See the Soil Erosion and Sediment Control Plan for the development prepared by Green Development. The SESC contains information for construction pollution prevention. For post construction pollution prevention see the report entitled “Stormwater Operation and Maintenance Plan for GD Richmond Beaver River I” prepared for this development by Green Development.

2.8 Standard 8: Land Uses with Higher Potential Pollutant Loads (LUHPPL)

The site is not considered a land use with high potential pollutant load (LUHPPL).

2.9 Standard 9: Illicit Discharges

No illicit discharges as outlined in the RISDIEM 3.2.9 are proposed as part of this project.

2.10 Standard 10: Soil Erosion and Sediment Control

A separate report entitled “Soil Erosion and Sediment Control Plan for GD Richmond Beaver River I” provides compliance with this Standard.

2.11 Standard 11: Stormwater Management System Operation and Maintenance

A separate report entitled “Stormwater Operation and Maintenance Plan for GD Richmond Beaver River I” provides detail for the short and long-term operation and maintenance for this site.

3.0 100-Year Floodplain

The Beaver River has an associated 100-year floodplain designated as Zone A and X on the property. The FEMA panels were last revised October 19,2010 and include Map 44009C0160H, 180H, 178H, and 159H. The Zone A 100 year floodplain has no base flood elevations associated with it. Given that no site grading is proposed no impact on the100-year floodplain will result. Based on the topography of the site and the downstream restriction of the River at Shannock Hill Road and an existing box culvert, the 100-year floodplain is estimated to flood within the wetland and overtop the road at Shannock Hill without backing up onto the upland portion of the site.

Appendix A: RIDEM Appendix A Checklist

APPENDIX A: STORMWATER MANAGEMENT CHECKLIST AND LID PLANNING REPORT

PROJECT NAME: GD Richmond Beaver River I	(RIDEM USE ONLY)
CONTACT FOR STORMWATER DESIGN QUESTIONS: Kevin Morin, P.E.	
PHONE NUMBER: (401) 295-4998	
EMAIL ADDRESS: km@green-ri.com	
BRIEF PROJECT DESCRIPTION: 5.25 MW AC/ 7.45MW DC Solar Energy Project	DATE RECEIVED

STORMWATER MANAGEMENT PLAN ELEMENTS

APPENDIX A: STORMWATER MANAGEMENT CHECKLIST	STORMWATER ANALYSIS AND DRAINAGE REPORT	SOIL EROSION AND SEDIMENT CONTROL PLAN	OPERATIONS AND MAINTENANCE PLAN
PART 1: PROJECT AND SITE INFORMATION **MINIMUM STANDARDS:** 6. REDEVELOPMENT 8. LUHHPL IDENTIFICATION **PART 2.** **MINIMUM STANDARD:** 1. LID SITE PLANNING **PART 3.** SUMMARY OF REMAINING STANDARDS **PART 4.** SUBWATERSHED MAPPING SITE PLAN DETAILS	ADDRESSES MINIMUM STANDARDS: 2. GROUNDWATER RECHARGE 3. WATER QUALITY VOLUME 4. CONVEYANCE & NATURAL CHANNEL PROTECTION 5. OVERBANK AND FLOOD PROTECTION 9. ILLICIT DISCHARGE DETECTION AND ELIM.	ADDRESSES MINIMUM STANDARDS: 7. POLLUTION PREVENTION DURING CONSTRUCTION 10. CONSTRUCTION EROSION AND SEDIMENTATION CONTROL	ADDRESSES MINIMUM STANDARDS: 7. POLLUTION PREVENTION AFTER CONSTRUCTION 11. OPERATIONS AND MAINTENANCE

Note: **All** stormwater construction projects **must submit** a Stormwater Management Plan (SMP). However, not every element listed below (see the Stormwater Management Plan Table) is required per the RISDISM and the RIPDES Construction General Permit (CGP). This checklist will help you identify the elements of the stormwater plan you are required to submit with your permit application.

PART 1. PROJECT AND SITE INFORMATION

PROJECT TYPE (Check all that apply)

☐ RESIDENTIAL	☐ COMMERCIAL	☐ FEDERAL	☐ RETROFIT	☐ RESTORATION
☐ ROAD	X UTILITY	☐ FILL	☐ DREDGE	☐ MINE

☐ OTHER: (please explain)	
SITE INFORMATION	
X VICINITY MAP: See Plan Set X EXISTING ZONING: R-3 (Residential, 3 acre minimum)	
DISCHARGE LOCATION: The WQv discharges to: (you may choose more than one answer if there are several discharge points on the project) (Guidance to identify receiving waters)	
☐ GROUNDWATER	GROUNDWATER X GAA ☐ GA ☐ GB
☐ SURFACE WATER	☐ ISOLATED WETLAND X NAMED WATERBODY: Beaver River ☐ UNNAMED WATERBODY CONNECTED TO NAMED WATERBDY
☐ MS4	☐ RIDOT ☐ RIDOT ALTERATION PERMIT IS APPROVED ☐ TOWN ☐ OTHER:_____
RECEIVING WATER INFORMATION: (check all that apply and *repeat* this row for each waterbody)	
THE WATER QUALITY VOLUME DISCHARGES TO: ☐ N/A (discharges to: CSO, Disconnected wetland or Groundwater) WATERBODY NAME: Beaver River WATERBODY ID: RI0008039R-03 IMPAIRMENTS: N/A ☐ TMDL FOR: N/A ☐ CONTRIBUTES TO A PRIORITY OUTFALL LISTED IN THE TMDL	☐ IMPAIRED (303(d) LIST) ☐ SRPW X COLDWATER ☐ WARMWATER ☐ UNASSESSED ☐ 4TH ORDER STREAM ☐ POND OF 50 ACRES OR MORE ☐ KNOWN HISTORY OF REPETITIVE FLOODING (i.e. Pocasset River) ☐ CONTRIBUTES STORMWATER TO A PUBLIC BEACH ☐ CONTRIBUTES TO SHELLFISHING GROUNDS
PROJECT HISTORY:	
☐ PRE-APPLICATION MEETING DATE: N/A	☐ MINUTES ARE ATTACHED
☐ RIDEM GRANT FUNDING INVOLVED: N/A	GRANT SOURCE:_____
☐ TOWN MASTER PLAN APPROVAL N/A (Project is concurrently going through Development Plan Review)	☐ MINUTES ARE ATTACHED
☐ SUBDIVISION SUITABILITY REQUIRED: N/A	APPROVAL #: _____

☐ PREVIOUS ENFORCEMENT ACTION HAS BEEN TAKEN ON THIS PROPERTY: N/A	ENFORCEMENT # _____
FRESHWATER WETLANDS JURISDICTION: X **FEMA FLOODPLAIN FIRMETTE HAS BEEN REVIEWED** ☐ CALCULATIONS ARE PROVIDED FOR CUT/FILL PROPOSED ANYWHERE WITHIN THE 100-YR FLOODPLAIN: N/A ☐ RESTRICTIONS OR MODIFICATINS ARE PROPOSED TO THE FLOWPATH OR VELOCITIES IN A FLOODWAY: N/A ☐ FLOODPLAIN STORAGE CAPACITY IS IMPACTED: N/A	AMOUNT OF FILL: _____(CY) AMOUNT OF CUT: _____(CY) N/A
CRMC JURISDICTION ☐ THIS PROJECT REQUIRES A CRMC PERMIT: N/A ☐ THE PROPERTY IS SUBJECT TO A SPECIAL AREA MANAGEMENT PLAN : N/A ☐ SEA LEVEL RISE MITIGATION WAS DESIGNED INTO THIS PROJECT: N/A	
MINUMUM STANDARD 8: LUHHPL IDENTIFICATION	
OFFICE OF WASTE MANAGEMENT (OWM) ☐ THERE ARE KNOWN OR SUSPECTED RELEASES OF HAZARDOUS MATERIAL AT THE SITE: N/A ☐ THIS SITE IS ON THE LIST OF CERCLA and STATE SITES in RI : N/A	OWM CONTACT: _____ ☐ SITE ID#:_____
STORMWATER INDUSTRIAL PERMITTING ☐ THERE ARE EXISTING OR PROPOSED ACTIVITIES THAT ARE CONSIDERED LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS (LUHPPLS) (see Table 3-2) : N/A ☐ CONSTRUCTION IS PROPOSED ON A SITE THAT IS SUBJECT TO THE MULTI-SECTOR GENERAL PERMIT (MSGP) UNDER RULE 31(B)15 OF THE RIPDES REGULATIONS. : N/A ☐ ADDITIONAL STORMWATER TREATMENT IS REQUIRED BY THE MSGP	ACTIVITIES: _____ SECTOR: _____ MSGP PERMIT #: _____ EXPLAIN ADDITIONAL TREATMENT: ____ _____
MINIMUM STANDARD 6. REDEVELOPMENT (*Required calculation for all construction projects)	
X PRE-CONSTRUCTION IMPERVIOUS AREA	TOTAL IMPERVIOUS AREA **(TIA)** = 0.026 acres
☐ CALCULATE THE SITE SIZE SITE SIZE **(SS)** = **(TSA)** – **(JW)** – **(CL)** = 35.93 acres	TOTAL SITE AREA **(TSA)** = 41.76 acres JURISDICTIONAL WETLANDS **(JW)**: 5.83 acres CONSERVATION LAND **(CL)** = N/A

(TIA)/(SS) = 0.0007 acres	**(TIA)/(SS)** IS **>** 0.4) ☐ YES (REDEVELOPMENT) (address minimum standards 3 and 7-11)	**(TIA)/(SS)** IS **<** 0.4) X NO (NEW DEVELOPMENT) (all standards must be addressed)

PART 2: MINIMUM STANDARD 1

LOW IMPACT DEVELOPMENT ASSESSMENT

(**NOT REQUIRED FOR REDEVELOPMENT OR RETROFITS**) – You may delete this section if it is not required

State Law requires the use of low impact-design techniques as the primary method of stormwater control to the maximum extent practicable. LID is intended to maintain or replicate predevelopment hydrology through the use of site planning, source control, and small-scale practices integrated throughout the site to prevent, infiltrate, and manage runoff as close to its source as possible. Non-structural LID techniques to Avoid and Reduce the stormwater impacts of development shall be explored as a first priority before LID structural practices are planned to Manage stormwater as part of a comprehensive LID approach.

The applicant must document specific LID Site Planning and Design Strategies applied for the project (see Manual Chapter Four and the *RI Low Impact Development (LID) Site Planning and Design Guidance Manual* for more details regarding each strategy). This checklist is designed to guide the required documentation of the site planning process, and to ensure that the proposed project is consistent with and taking advantage of LID strategies required or allowed in the municipality where the project is proposed. Included within this checklist are specific LID techniques (and practices) taken from the *RI Low Impact Development (LID) Site Planning and Design Guidance Manual* that a municipality may require or allow.

If a particular strategy is not used or not applicable, a written description of why a certain method is not used or applicable at the site must be provided. Appropriate answers may include such statements as:

- Town requires XXX (state the specific local requirement)
- Meets Town's dimensional requirement of XXXXX.
- Not practical for site because XXXXXX.
- Applying for waiver/variance to achieve this (pending; was approved; was denied)
- Applying for wavier/variance to seek relief from this (pending; approved; denied)

A) PRESERVATION OF UNDISTURBED AREAS, BUFFERS AND FLOODPLAINS X Sensitive resource areas and site constraints are identified (required) X Local development regulations have been reviewed (required) X All vegetated buffers and coastal and freshwater wetlands have been designed to be protected during and after construction ☐ Conservation Development or other site design technique to protect open space and pre-development hydrology; [NOTE: If this technique has been used, check box and skip to **c.**] N/A X Maintain as much natural vegetation and pre-development hydrology as possible	***IF NOT IMPLEMENTED - EXPLAIN HERE***
B) LOCATE DEVELOPMENT IN LESS SENSITIVE AREAS AND WORK WITH THE NATURAL LANDSCAPE CONDITIONS, HYDROLOGY, AND SOILS X Building envelopes/ development sites directed away from wetlands/waterbodies ☐ Development and stormwater systems are located in areas with greatest infiltration capacity (e.g., soil groups A and B.) No BMP's proposed ☐ Plans show measures to prevent soil compaction in areas designated as Qualified Pervious Areas (QPA's): N/A X Building envelopes/ development sites are directed away from floodplains X Site designed to locate buildings, roadways and parking to avoid impacts to surface water features. X Building envelopes/ development sites directed away from steep slopes (≥15%) ☐ Other:	***IF NOT IMPLEMENTED - EXPLAIN HERE***
C) MINIMIZE CLEARING AND GRADING X Site clearing restricted to <u>minimum area needed</u> for building footprints, development activities, construction access and safety. Site already cleared. Project envelope is within the limits of the existing clearing. X Site designed to locate buildings, roadways and parking to minimize grading (cut and fill quantities): Existing grades on site are already conducive to the solar arry project and are to remain as is. X Protection for stands of trees and individual trees and their root zones to be preserved is specified and such protection extends at least to the drip line X Notes on plan specify that public trees that are removed or damaged during construction shall be replaced with equivalent. Site is primarily located within existing cleared /agricultural field areas.	***IF NOT IMPLEMENTED - EXPLAIN HERE***

D) REDUCE IMPERVIOUS COVER	***IF NOT IMPLEMENTED - EXPLAIN HERE***
X Reduce roadway widths (≤22 feet for ADT ≤ 400; ≤ 26 feet for ADT 400-2,000) Access driveway is proposed as gravel at 20' wide to provide for emergency and maintenance access. X Reduce driveway areas (length minimized via reduced ROW width (≤ 45 ft.) and/or reduced (or absolute minimum) front yard setback; width minimized to ≤ 9 ft. wide one lane; ≤ 18 ft. wide two lanes; shared driveways; pervious surface) Access driveway at minimum length for emergency and maintenance services only. X Reduced building footprint: Explain approach No foundations proposed for solar racking units. Units will be anchored with driven posts. ☐ Reduce sidewalk area (≤ 4 ft. wide; one side of the street; unpaved path; pervious surface) N/A ☐ Reduce cul-de-sacs (radius < 45 ft; vegetated island; alternative turn-around) N/A ☐ Reduced parking lot area: Explain approach N/A X Pervious surfaces (driveways, sidewalks, parking areas/overflow parking area) Pervious gravel driveway section is proposed. The solar arrays are not anchored with full foundations. X Maximum Impervious Surface (project meets or is less than the maximum specified by the Zoning Ordinance **N/A** ☐ Other (describe):	
E) DISCONNECT IMPERVIOUS AREA	***IF NOT IMPLEMENTED - EXPLAIN HERE***
☐ Impervious surfaces have been disconnected and runoff has been diverted to QPAs to the maximum extent possible N/A ☐ Residential street edges allow side-of-the-road drainage into vegetated open swales N/A ☐ Parking lot landscaping breaks up impervious expanse AND accepts runoff N/A ☐ Other:	No impervious area increase is proposed. No BMP's proposed. Cover type from pre (cultivated crops, straight rows) to post (grass) decrease flows to Beaver River without any intermittent treatment, detaining and infiltration.
F) MITIGATE RUNOFF AT THE POINT OF GENERATION	***IF NOT IMPLEMENTED - EXPLAIN HERE***
☐ Small-scale BMPs have been designated to treat runoff as close as possible to the source	No impervious area increase is proposed. No BMP's proposed. Cover type from pre (cultivated crops, straight rows) to post (grass) decrease flows to Beaver River without any intermittent treatment, detaining and infiltration.

G) PROVIDE LOW-MAINTENANCE NATIVE VEGETATION X Low-maintenance landscaping is proposed using native species and cultivars ☐ Plantings of native trees and shrubs in areas previously cleared of native vegetation are shown on the site plan *N/A: only low vegetation can be planted due to the proposed primary use of the development.* X Lawn areas have been limited and/or minimized and yards have been kept undisturbed to the maximum extent on residential lots Proposed cleared areas will not be actively maintained with use of fertilizers; species will be low growth and drought tolerant.	***IF NOT IMPLEMENTED - EXPLAIN HERE***
H) RESTORE STREAMS/WETLANDS ☐ Historic drainage patterns have been restored by removing closed drainage systems, daylighting buried streams, and/or restoring degraded stream channels and/or wetlands. ☐ Removal of invasive species ☐ Other	***IF NOT IMPLEMENTED - EXPLAIN HERE*** No restoration required. Existing streams and wetlands will not be removed, blocked or altered during this project.

PART 3: SUMMARY OF REMAINING STANDARDS

Minimum Standard 2: Groundwater Recharge

☐ YES X NO The project has been designed to meet the groundwater recharge standard.

If No, please explain the justification for groundwater recharge criterion waiver (i.e. threat of groundwater contamination, or physical limitation), if applicable (see Section 3.3.2);

Please describe your waiver request

Pre to Post impervious area totals are the same (0.042 acres). No additional impervious area is proposed. No BMP's are proposed. Cover type from pre (cultivated crops, straight rows) to post (grass) decrease flows to Beaver River without any intermittent treatment, detaining and infiltration, thus no water groundwater recharge is proposed. See Summary of Recharge calculations in Table 2-1

☐ YES X NO Is this site listed as a CERCLA or contaminated site?, if yes?

☐ YES ☐ NO Has any part of the site been approved for infiltration by the Office of Waste Management? (see Subsurface Contamination Guidance)

☐ YES X NO Is there an ELUR on the property?

TABLE 2-1: Summary of Recharge (see Manual section 3.3.2)

Subwatershed	Total Re_v Required (Acre-ft)	LID Stormwater Credits (Manual see Section 4.6.1)		Recharge Required by Remaining BMPs (acre-ft)	Recharge Provided by BMPs (acre-ft)
		Impervious volume directed to a QPA (acre-ft)	Recharge Credit Applied (acre-ft)		
DP-1:	0.00123	.042	.0004	0	0.0083 ac-ft (36 cubic feet)
Totals:	0.00123	0.042	.0004	0	0.0083 ac-ft (36 cubic feet)

**Note: Only BMPs listed in Manual Table 3-5, List of BMPs Acceptable for Recharge may be used to meet the recharge requirement.*

X Indicate below where the pertinent calculations and/or information for the above items are provided (i.e. name of report/document, page numbers); Pre to Post impervious area totals are the same (0.042 acres) No additional impervious area is proposed. No BMP's are proposed. Cover type from pre (cultivated crops, straight rows) to post (grass) substantially decrease flows to Beaver River without any intermittent treatment, detaining and infiltration, thus no water groundwater recharge is proposed. A negligible recharge volume results after consideration of recharge credit. Impervious equipment slabs drain toward vegetated areas and permeable stone access driveway.

Minimum Standard 3: Water Quality

X YES ☐ NO Does this project meet or exceed the required water quality volume WQv (see section 3.3.3)?

☐ YES X NO Is the proposed final impervious cover is greater than 20% of the disturbed area (see section 3.3.3)?

☐ If yes, the Spit Pervious/Impervious method in Hydro-Cad was used to calculate WQv, or

☐ If yes, TR-55 or TR-20 was used to calculate WQv, and

X If no, the project meets the minimum WQv of 0.2 watershed inches over the entire disturbed area.

X YES ☐ NO Does this project meet or exceed the ability to treat required water quality flow WQf(see section 3.3.3.2)?

☐ YES X NO Is there an increase of impervious cover to a receiving water body with impairments?

If yes, please indicate below the method that was used to address the water quality requirements of no further degradation to a low quality water.

☐ RISDISM section H.3 Pollutant Loading Analysis

☐ The Water Quality Guidance Document (Water Quality Goals and Pollutant Loading Analysis Guidance for Discharges to Impaired Waters)

☐ YES X NO BMPs are proposed that are on the approved technology list if yes, please provide all of the required worksheets from the manufacturer. No BMP's proposed.

☐ YES X NO Additional pollutant-specific requirements and/or pollutant removal efficiencies are applicable to the site as the result of a TMDL, SAMP or other watershed-specific requirements; If yes, please describe:

N/A

TABLE 3-1: Summary of Water Quality (see Manual section 3.3.3)

Subwatershed	Total WQ_v Required (Acre-ft)	LID Stormwater Credits (Manual see Section 4.6.1)		Water Quality Treatment Remaining (acre-ft)	Water Quality Provided by BMPs (acre-ft)
		Impervious volume directed to a QPA (acre-ft)	Water Quality Credit Applied (acre-ft)		
DP-1:	0.0035	0.042	0.0004	0.0027	* see below
DP-2:					
DP-3:					
DP-4:					
Totals:					

**Note: Only BMPs listed in Chapter 5 of the Manual or the Approved Technologies List of BMPs is Acceptable for Water Quality treatment.*

☐ YES ☐ NO This project has met the setback requirements for each BMP. If no, please explain *_The water quality treatment remaining results in a negligible volume and there is no increase in impervious area from the site. The concrete pads are located upgradient of the permeable access driveway that will also provide for inilitration for runoff traveling from the inverter pads toward the wetlands. Additional BMP's are not warranted.

☐ Indicate below where the pertinent calculations and/or information for the above items are provided (i.e. name of report/document, page numbers);

Minimum Standard 4: Conveyance and Natural Channel Protection (3.3.4)

X YES ☐ NO Is this standard waived? If yes, please check indicate one or more of the reasons below:

☐ The project directs discharge to a large river (i.e., 4th-order stream or larger. See Appendix I for State-wide list and map of stream order), bodies of water >50.0 acres in surface area (i.e., lakes, ponds, reservoirs), or tidal waters.

☒ The project directs is a small facility with impervious cover of less than or equal to 1 acre.

☐ The project has a post-development peak discharge rate from the facility that is less than 2 cfs for the 1-year, 24-hour Type III design storm event (prior to any attenuation). (**NOTE:** *LID design strategies can greatly reduce the peak discharge rate)*

☐ YES ☐ NO Conveyance and natural channel protection for the site have been met.

If no, explain why _N/A_____

TABLE 4-1: Summary of Channel Protection Volumes (see Manual section 3.3.4)

Drainage Point	Receiving Water Body Name	Coldwater Fishery? Y/N	Total CPv Required (acre-ft)	Total CPv Provided (acre-ft)	Release Rate Modeled in the 2-yr storm (cfs)
DP-1:					
DP-2:					
DP-3:					
DP-4:					
Totals:					

N/A

☐ YES ☐ NO The CPv is released at roughly a uniform rate over a 24-hour duration (see example sizing calculations in Appendix D of the RISDISM). N/A

☐ YES ☐ NO Do additional design restrictions apply resulting from any discharge to cold water fisheries; N/A

If yes, please indicate restrictions and solutions

☐ Indicate below where the pertinent calculations and/or information for the above items are provided (i.e. name of report/document, page numbers);

__N/A_____

Minimum Standard 5: Overbank Flood Protection (3.3.5) (and other potential high flows)

X YES ☐ NO Is this standard waived? If yes, please check indicate one or more of the reasons below:

☐ The project directs discharge to a large river (i.e., 4th-order stream or larger. See Appendix I for State-wide list and map of stream order), bodies of water >50.0 acres in surface area (i.e., lakes, ponds, reservoirs), or tidal waters.

X A Downstream Analysis (see section 3.3.6), indicates that peak discharge control would not be beneficial or would exacerbate peak flows in a downstream tributary of a particular site (i.e. through coincident peaks)

☐ YES X NO Does the project flow to an MS4 system? If yes, indicate below:

☐ RIDOT ☐ Other _____

(**NOTE**: *your project could be approved by RIDEM but not meet RIDOT or Town standards. RIDOT's*

*regulations indicate that post-volumes must be **less** than pre-volumes for the 10-yr storm at the design point entering the RIDOT system)*. If you have not already received approval for the discharge to an MS4, please explain your strategy to comply with RIDEM and the MS4.

_____
_____
_____

X YES ☐ NO Did you use a model for your analysis, if yes, indicate below

☐ TR-55 ☐ TR-20 X Hydrocad ☐ Other _____

X YES ☐ NO Does the hydrologic model demonstrate that flows from the 100-year event will be safely conveyed to a control practice designed to manage the 100-year event? If no, please explain

_____
_____

X YES ☐ NO Do off-site areas contribute to the subwatersheds and design points? If yes,

X YES ☐ NO Are the areas modeled as "present condition" for both pre- and post-development analysis

X YES ☐ NO Are the off-site areas are shown on the subwatershed maps

X YES ☐ NO Does the hydrologic model confirm safe passage of the 100-year flow through the site for off-site runoff;

☐ YES X NO Is a Downstream Analysis required? (see Manual Section 3.3.6):

Please calculate the following:

Area of disturbance within the sub-watershed (areas) 31.2 +/- (existing agricultural fields already disturbed for row crops and/or fallow over winter season with minimal cover)

Impervious cover (%) 0%

☐ YES X NO Is a dam breach analysis required (earthen embankements over six (6) feet in height, or a capacity of 15 acre-feet or more, and contributes to a significant or high hazard dam?

X YES ☐ NO Does this project meet the overbank flood protection standard?

Table 5-1 Hydraulic Analysis Summary

Subwatershed (design point)	1.2" Peak Flow Pre (cfs)	1.2" Peak Flow Post (cfs)	1-yr Peak Flow Pre (cfs)	1-yr Peak Flow Post (cfs)	10-yr Peak Flow Pre (cfs)	10-yr Peak Flow Post (cfs)	100-yr Peak Flow Pre (cfs)	100-yr Peak Flow Post (cfs)
Wetland (100-127 & 200-268)	0.00	0.00	19.23	2.86	58.7	25.62	136.61	88.10
Totals:	0.00	0.00	19.23	2.86	58.7	25.62	136.61	88.10

X Indicate below where the pertinent calculations and/or information for the above items are provided (i.e. name of report/document, page numbers);

✓ Existing condition analysis for each subwatershed, including (curve numbers, times of concentration, runoff rates, volumes, and water surface elevations showing methodologies used and supporting calculations);

Section 3.5.3 and Appendix 3.5.4 of the Stromwater Management Report.

✓ Proposed condition analysis for each subwatershed, including (curve numbers, times of concentration, runoff rates, volumes, water surface elevations, and routing showing the methodologies used and supporting calculations);

_____
_____
_____

✓ Final sizing calculations for structural stormwater BMPs including, contributing drainage area, storage, and outlet configuration;

_____
_____
_____

☐ Stage-storage, inflow and outflow hydrographs for storage facilities (e.g., detention, retention, or infiltration facilities);

N/A_____
_____
_____

Table 5-2 Summary of Best Management Practices

DP No.	BMP ID.	BMP Type (i.e. bioretention or tree filter)	BMP Functions (acre-ft)				Overbank Flood Reduction	Internal Bypass	Horizontal Setback Criteria Met	
			Pre-treatment (volume)	Re_v	WQ_v	CP_v	Y/N	Y/N	Distance (ft)	From constraint (i.e. private well or foundation)
		TOTAL:								

Table 5-3 Summary of Soils to evaluate each BMP

DP No.	BMP ID.	BMP Type (i.e. bioretention or tree filter)	Soils Analysis for Each BMP						
			Primary Test Pit ID #	Secondary Test Pit ID #	Top of Filter Elevation (ft)	SHWT Elevation (ft)	Separation Distance (ft)	Hydrologic Soil Group A,B,C or D	Exfiltration Rate Applied (in/hr)
		TOTAL:							

Minimum Standard 7: (questions are now asked in Minimum Standard 10 and 11)

Minimum Standard 8: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

☐ YES X NO Are there any existing activities or land uses proposed that would be considered LUHPPLs (see Manual Table 3-2)? If yes, please describe. If no, you may continue on to Minimum Standard 9:

_____

_____

☐ YES ☐ NO Are these activities already covered under an MSGP? If, no please explain if you have applied for an MSGP, or intend to do so?

_N/A_____

_____

☐ YES ☐ NO ☐ List the specific BMPs that are proposed for this project that receive stormwater from LUHPPL drainage areas. These BMP types must be listed in Manual Table 3-3, "Acceptable BMPs for Use at LUHPPLs";

Please list BMPs __N/A_____

☐ Additional BMPs, or additional pretreatment BMP's if any, that meet RIPDES MSGP requirements;

Please list BMPs __N/A_____

☐ Indicate below where the pertinent calculations and/or information for the above items are provided (i.e. name of report/document, page numbers);_____

_____

Minimum Standard 9: Illicit Discharges

☐ YES X NO Have you checked for illicit discharges?

☐ YES X NO Have any been found and/or corrected? If yes, please identify

_____

X YES ☐ NO Does your report explain preventative measures that keep non-stormwater discharges out of the Waters of the State (during and after construction)?

Minimum Standard 10 Soil Erosion and Sediment Control

X YES ☐ NO Have you included a Soil Erosion and Sediment Control Plan Set and/or Complete Construction Plan Set?

X YES ☐ NO Did you provide a separately bound document based upon the SESC Template? If yes, proceed to Minimum Standard 11 (the following items can be assumed to be addressed). If no, include a document with your submittal that addresses the following:

Elements of a SESC Plan:

☒ Soil Erosion and Sediment Control Plan project narrative including a description of how the fifteen (15) Performance Criteria have been met:

☒ Provide Natural Buffers and Maintain Existing Vegetation;

☒ Minimize Area of Disturbance;

☒ Minimize the Disturbance of Steep Slopes;
☒ Preserve Topsoil;
☒ Stabilize Soils;
☒ Protect Storm Drain Inlets;
☒ Protect Storm Drain Outlets;
☒ Establish Temporary Controls for the Protection of Post-Construction Stormwater Control Measures;
☒ Establish Perimeter Controls and Sediment Barriers;
☒ Divert or Manage Run-On from Up-Gradient Areas;
☒ Properly Design Constructed Stormwater Conveyance Channels;
☒ Retain Sediment On-Site;
☒ Control Temporary Increases in Stormwater Velocity, Volume, and Peak Flows;
☒ Apply construction Activity Pollution Prevention Control Measures;
☒ Install, Inspect, and Maintain Control Measures and Take Corrective Actions.

☒ Qualified SESC plan preparer's information and certification;
☒ Operator's information and certification; if not known at the time of application the operator must certify the SESC Plan upon selection and prior to initiating site activities;
☒ Description of control measures such as temporary sediment trapping and conveyance practices, including design calculations and supporting documentation, as required.

Minimum Standard 7&11: Stormwater Management System Operation, Maintenance and Pollution Prevention Plan (See section 3.2.11 and Appendices G and E for guidance)

X YES ☐ NO Have you minimized all sources of pollutant contact with stormwater runoff, to the maximum extent practicable?

X YES ☐ NO Have you provided a separately bound **Operations, Maintenance and Pollution Prevention Manual** for the site and for all of the BMPs?

The (O&M and PP Plan Contains):

X YES ☐ NO Contact name, address, and phone number of the responsible party for maintenance;

X YES ☐ NO 8.5" x 11" map indicating the location of all of the proposed stormwater BMPs that will require maintenance;

X YES ☐ NO Description of routine and non-routine maintenance tasks and their frequency for required elements for each BMP;

X YES ☐ NO A description and delineation of public safety features;

X YES ☐ NO An estimated operations and maintenance budget;

X YES ☐ NO Minimum vegetative cover requirements;

X YES ☐ NO Access and safety for maintenance?

X YES ☐ NO Lawn, Garden and Landscape Management meet the requirements of section G.7? If not, why not?

_____

_____

X YES ☐ NO Is the property owner or homeowners association is responsible for the stormwater maintenance of all BMP's? The lease between property owner and operator of the solar project requires the lease to be responsible for all aspect of the project associated with the solar array including construction and post-

construction over the life of the lease as well as decommissioning. The O&M report discusses this as well.

If no, you must provide a legally binding and enforceable maintenance agreement (see Appendix E-page 26) that identifies the entity that will be responsible for maintenance of the stormwater. Please indicate where this agreement can be found in your report:_____

☐ YES ☒ NO Do you anticipate that you will need legal agreements related to the stormwater structures? (e.g. off-site easements, deed restrictions, and covenants).
If yes, have you obtained them? Or please explain your plan to obtain them:

_____
_____

☐ YES ☒ NO Is stormwater being directed from public areas to private property? If yes, *(***NOTE***: this is not allowed unless there is a funding mechanism in place to provide the finances for the long-term maintenance of the BMP and drainage unless there is a funding mechanism is demonstrated that can guarantee the long-term maintenance of a stormwater BMP by an individual homeowner*)

_____
_____

Pollution Prevention Section Contains:

☐ YES ☒ NO Designated snow stockpile locations? In the event the access driveway needs to be plowed it will be plowed to either side along its length and not to a central location.

☐ YES ☒ NO Trash racks to prevent floatables, trash and debris from discharging to waters of the state? N/A, none proposed

☐ YES ☒ NO Asphalt only based sealants? N/A

☐ YES ☒ NO Pet waste stations? (**NOTE:** *if a receiving water has a bacterial impairment and the project involves housing units, this could be an important part your pollution prevention plan*) N/A

☐ YES ☒ NO Regular sweeping? Please describe _N/A – no impervious driveways to be swept an no sanding/salting is proposed.

☐ YES ☒ NO Deicing specifications in accordance with Appendix G of the Manual. (**NOTE***: if the groundwater is GAA or this area contributes to a drinking water supply, this could be an important part of your pollution prevention plan (see Appendix G): N/A- no deicing is proposed*

_____

☐ YES ☒ NO A prohibition of phosphate based fertilizers? (**NOTE**: *if the site discharges to a phosphorus impaired waterbody, this could be an important part of your pollution prevention plan*)?N/A, no phosphorous impaired waterbody proposed

PART 3: SUBWATERSHED MAPPING AND SITE PLAN DETAILS

Existing and Proposed Subwatershed Mapping (REQUIRED)

☒ Existing and proposed drainage area delineations

☐ Locations, cross sections, and profiles of all streams and drainage swales and their method of stabilization;

☒ Drainage flow paths, mapped according to the DEM *Guidance for Preparation of Drainage Area Maps* (included in Appendix K).

☒ Complete drainage area boundaries; include off-site areas in both mapping and analyses, as applicable;

☒ Logs of borings and/or test pit investigations along with supporting soils/geotechnical report.

☒ Mapped seasonal high water table,

☒ Mapped locations of the site-specific borings and/or test pits and soils information from the test pits at the locations of the BMPs

☐ Mapped locations of the BMPs with the BMPs consistently identified on the Site Construction Plans

☐ Mapping bedrock within 3' of any BMP

X YES ☐ NO Soils were logged by a:

x DEM-licensed Class IV soil evaluator Name: Christian Sutter

☐ RI-registered PE. Name; _____

Subwatershed Summary *(add or subtract rows as necessary)*				
Subwatershed (acres to each design point)	**First Receiving Water ID or MS4**	**Area Disturbed (acres)**	**Existing Impervious (acres)**	**Proposed Impervious (acres)**
DP-1:				
DP-2:				
DP-3:				
DP-4:				
Totals:				

Site Construction Plans (the following applicable specifications are provided)

☒ Existing and proposed plans (scale not greater than 1" = 40') with North arrow

☒ Existing and proposed site topography (with 1 or 2-foot contours). 10-foot contours accepted for off-site areas

☒ Boundaries of existing predominant vegetation and proposed limits of clearing;

☒ Site Location clarification

☒ Location and field-verified boundaries of resource protection areas such as:

- freshwater and coastal wetlands, lakes, ponds,
- coastal shoreline features
- Perennial and intermittent streams, in addition to areas subject to storm flowage (ASSFs);

☒ All required setbacks (e.g., buffers, water supply wells, septic systems);

☒ Representative cross-section and profile drawings, notes and details of structural stormwater management practices and conveyances (i.e., storm drains, open channels, swales, etc.), which include:

- Location and size of the stormwater treatment practices (type of practice, depth, area). Stormwater treatment practices (BMPs) must have labels that correspond to table 5-2;
- Design water surface elevations (applicable storms);

- Structural details of outlet structures, embankments, spillways, stilling basins, grade control structures, conveyance channels, etc.;
- Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.);
- Location of floodplain and, if applicable, floodway limits and relationship of site to upstream and downstream properties or drainage that could be affected by work in the floodplain;
- Planting plans for structural stormwater BMPs, including species, size, planting methods, and maintenance requirements of proposed planting;
- Logs of borings and/or test pit investigations along with supporting soils/geotechnical report and corresponding water tables.

☐ Mapping of any OWM approved activities related to current/former site use areas for any known contamination and/or remedial clean-up efforts.

☒ Location of existing and proposed roads, buildings, and other structures including limits of disturbance;

- Existing and proposed utilities (e.g., water, sewer, gas, electric) and easements;
- Location of existing and proposed conveyance systems such as grass channels, swales, and storm drains, as well as location(s) of final discharge point (wetland, waterbody);
- Cross sections of roadways, with edge details such as curbs and sidewalks;
- Location and dimensions of channel modifications, such as bridge or culvert crossings;
- Locations, cross sections, and profiles of all stream or wetland crossings and their method of stabilization

< **(As applicable)**

Appendix B: Soil Evaluations

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment System Program

Site Evaluation Form
Part A – Soil Profile Description

Application Number: NA

Property Owner: William M. Stamp Jr. Trustee
Property Location: 172 Beaver River Rd. (AP 8E Lot 12) Richmond, RI
Date of Test Hole: April 11, 2018
Soil Evaluator: Chris Sutter
License Number: D-4077
Weather: Clear, 40's
Shaded: Yes ☑ No ☐
Time: 12:30 pm

TH 1 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
A	0-10"	C	S	10YR 3/2					fsl	1-sbk	fri	4
Bw	10-36"	C	S	10YR 5/6					fsl	1-sbk	fri	4
C1	36-90"	C	S	2.5Y 5/4					gs	0-sg	L	1
C2	90-108"			2.5Y 6/3					s	0-sg	L	1

TH 2 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
A	0-15"	C	S	10YR 3/2					fsl	1-sbk	fri	4
Bw	15-30"	C	S	10YR 4/6					ls	1-sbk	fri	3
C1	30-42"	C	S	2.5Y 4/3					gs	0-sg	L	1
C2	42-96"			2.5Y 5/3	7.5YR 5/8	C	3	P	s	0-sg	L	1

TH 1 Soil Class Outwash Total Depth 108" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 96" (og)

TH 2 Soil Class Outwash Total Depth 96" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 60" SHWT 42" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment System Program

Site Evaluation Form
Part A – Soil Profile Description

Application Number: NA

Property Owner: William M. Stamp Jr. Trustee
Property Location: 172 Beaver River Rd. (AP 8E Lot 12) Richmond, RI
Date of Test Hole: April 11, 2018
Soil Evaluator: Chris Sutter
License Number: D-4077
Weather: Clear, 40's
Shaded: Yes ☑ No ☐
Time: 12:30 pm

TH 3 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
A	0-18"	C	S	10YR 3/2					sl	1-sbk	fri	3
Bw	18-30"	C	S	10YR 4/6					sl	1-sbk	fri	3
C1	30-42"	C	S	2.5Y 5/4					gs	0-sg	L	1
C2	42-60"	C	S	2.5Y 6/4	7.5YR 5/8	C	3	P	s	0-sg	L	1
C3	60-96"			2.5Y 5/3					vfs	0-m	fri	7

TH 4 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
A	0-20"	C	S	10YR 3/1					fsl	1-sbk	fri	4
Bw	20-39"	C	S	10YR 4/6					ls	1-sbk	fri	3
C	39-96"			2.5Y 5/4	7.5YR 5/8	C	3	P	gs	0-sg	L	1

TH 3 Soil Class Outwash Total Depth 96" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 60" SHWT 42" (og)

TH 4 Soil Class Outwash Total Depth 96" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 48" SHWT 39" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment System Program

Site Evaluation Form
Part A – Soil Profile Description

Application Number: NA

Property Owner: William M. Stamp Jr. Trustee
Property Location: 172 Beaver River Rd. (AP 8E Lot 12) Richmond, RI
Date of Test Hole: April 11, 2018
Soil Evaluator: Chris Sutter
License Number: D-4077
Weather: Clear, 40's
Shaded: Yes ☑ No ☐
Time: 12:30 pm

TH 5 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
A	0-12"	C	S	10YR 3/2					fsl	1-sbk	fri	4
Bw	12-18"	C	S	10YR 4/6					gls	1-sbk	fri	3
C1	18-48"	C	S	2.5Y 5/4	7.5YR 5/8	C	3	P	gs	0-sg	L	1
C2	48-96"			2.5Y 6/4	7.5YR 5/8	C	3	P	s	0-sg	L	1

TH 6 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-140"	C	S	10YR 3/1					sl	1-sbk	fri	4
C1	14-38"	C	S	10YR 4/6	7.5YR 5/8	C	3	P	gls	1-sbk	fri	3
C2	38-96"			2.5Y 5/4	7.5YR 5/8	C	3	P	gs	0-sg	L	1

TH 5 Soil Class Outwash Total Depth 96" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 42" SHWT 30" (og)

TH 6 Soil Class Outwash Total Depth 96" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 32" SHWT 24" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment System Program

Site Evaluation Form
Part A – Soil Profile Description

Application Number: NA

Property Owner: William M. Stamp Jr. Trustee
Property Location: 172 Beaver River Rd. (AP 8E Lot 12) Richmond, RI
Date of Test Hole: April 11, 2018
Soil Evaluator: Chris Sutter
License Number: D-4077
Weather: Clear, 40's
Shaded: Yes ☑ No ☐
Time: 12:30 pm

TH 7 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-10"	C	S	10YR 3/2					fsl	1-sbk	fri	4
Bd	10-32"	C	S	2.5Y 2.5/1	7.5YR 5/8	C	3	P	gls	0-m	firm	9
C	32-96"			2.5Y 5/4	7.5YR 5/8	C	3	P	gcos	0-m	fri	1

TH 8 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-18"	C	S	10YR 3/1					sl	1-sbk	fri	3
Bw	18-22"	C	S	10YR 5/6					gls	1-sbk	fri	3
Cd	22-54"	C	S	2.5Y2.5/1	7.5YR 5/8	C	3	P	s	0-m	firm	9
C2	54-96"			2.5Y 5/4					gs	0-sg	L	1

TH 7 Soil Class Outwash Total Depth 96" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 36" SHWT 24" (og)

TH 8 Soil Class Outwash Total Depth 96" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 52" SHWT 36" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment System Program

Site Evaluation Form
Part A – Soil Profile Description

Application Number: NA

Property Owner: William M. Stamp Jr. Trustee
Property Location: 172 Beaver River Rd. (AP 8E Lot 12) Richmond, RI
Date of Test Hole: April 11, 2018
Soil Evaluator: Chris Sutter
License Number: D-4077
Weather: Clear, 40's
Shaded: Yes ☑ No ☐
Time: 12:30 pm

TH 9 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-12"	C	S	10YR 3/1					sl	1-sbk	fri	3
Bw	12-24"	C	S	10YR 4/6					ls	1-sbk	firm	3
C1	24-36"	C	S	2.5Y 5/4					s	0-sg	L	1
C2	36-44"	C	S	2.5Y 5/2	7.5YR 5/8	C	3	P	vfs	0-m	fri	7
C3	44-96"			2.5Y 5/4					gs	0-sg	L	1

TH 10 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-15"	C	S	10YR 2/1					sl	1-sbk	fri	3
Bw	15-34"	C	S	10YR 5/6					gls	1-sbk	fri	3
C1	34-50"	C	S	2.5Y 5/4	7.5YR 5/8	C	3	P	s	0-sg	L	9
C2	50-96"			2.5Y 6/3					gs	0-sg	L	1

TH 9 Soil Class Outwash Total Depth 96" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 54" SHWT 32" (og)

TH 10 Soil Class Outwash Total Depth 96" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 60" SHWT 48" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment System Program

Site Evaluation Form
Part A – Soil Profile Description

Application Number: NA

Property Owner: William M. Stamp Jr. Trustee
Property Location: 172 Beaver River Rd. (AP 8E Lot 12) Richmond, RI
Date of Test Hole: April 11, 2018
Soil Evaluator: Chris Sutter
License Number: D-4077
Weather: Clear, 40's
Shaded: Yes ☑ No ☐
Time: 12:30 pm

TH 11 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-12"	C	S	10YR 3/1					sl	1-sbk	fri	3
Bw	12-364"	C	S	10YR 4/6					ls	1-sbk	firm	3
C1	36-72"	C	S	2.5Y 5/4					gls	0-m	fri	6
C2	72-80"	C	S	2.5Y 5/4					gs	0-sg	L	1
C3	80-108"			2.5Y 6/3					s	0-sg	L	1

TH 12 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-12"	C	S	10YR 3/2					sl	1-sbk	fri	3
Bw	12-29"	C	S	10YR 3/6					gls	1-sbk	fri	3
C1	29-42"	C	S	2.5Y 6/3					s	0-sg	L	1
C2	42-62"	C	S	2.5Y 5/3	7.5YR 5/8	C	3	P	gs	0-sg	L	1
C3	62-114"			2.5Y 6/3					s	0-sg	L	1

TH 11 Soil Class Outwash Total Depth 108" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 102" SHWT 84" (og)

TH 12 Soil Class Outwash Total Depth 114" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 108" (og)

Comments:

Appendix C: Temporary Sediment Trap Calculations

TEMPORARY SEDIMENT TRAP CALCULATIONS

Applicability: Use Temporary Sediment Traps for disturbed areas where the contributing drainage area is 5 acres or less.
Refer to the Rhode Island Soil Erosion Control Handbook - Section Six: Sediment Control Measures - Temporary Sediment Traps

GREEN development, LLC

3760 Quaker Lane
North Kingstown, RI 02858
(401) 295-4998
www.green-ri.com

Sediment Trap # 1

Drainage Area (DA) = 4.841 Acres

Required Sediment Storage Volume Calculation; V= DA x 1"
(RISDISM Standard 10 V = **17,573 cu.ft.**
Requires 1" runoff Volume)

Wet Storage Volume Calculation; Vw= 0.85 x Aw x Dw
Vw= 10,181 cu.ft.
Wet Storage Volume Check = Vw > 0.5 V Ok

Dry Storage Volume Calculation; Vd= [(Aw + Ad)/2] * Dd
Vd= 13,420 cu.ft.

Provided Sediment Storage Volume **V= 23,601 cu.ft.**

Sediment Trap Details

	Abbr	Value	Unit
Wet Storage Depth	Dw	2.0	feet
Dry Storage Depth	Dd	2.0	feet
Total Depth	D	4.0	feet
Bottom of Trap Area	Ab	4,648	sq.ft
Wetted Surface Area	Aw	5,989	sq.ft
Surface Area at Outlet	Ad	7,431	sq.ft

Sediment Trap # 2

Drainage Area (DA) = 4.980 Acres

Required Sediment Storage Volume Calculation; V= DA x 1"
(RISDISM Standard 10 V = **18,077 cu.ft.**
Requires 1" runoff Volume)

Wet Storage Volume Calculation; Vw= 0.85 x Aw x Dw
Vw= 9,056 cu.ft.
Wet Storage Volume Check = Vw > 0.5 V Ok

Dry Storage Volume Calculation; Vd= [(Aw + Ad)/2] * Dd
Vd= 11,524 cu.ft.

Provided Sediment Storage Volume **V= 20,580 cu.ft.**

Sediment Trap Details

	Abbr	Value	Unit
Wet Storage Depth	Dw	1.5	feet
Dry Storage Depth	Dd	1.5	feet
Total Depth	D	3.0	feet
Bottom of Trap Area	Ab	6,001	sq.ft
Wetted Surface Area	Aw	7,103	sq.ft
Surface Area at Outlet	Ad	8,262	sq.ft

TEMPORARY SEDIMENT TRAP CALCULATIONS

Applicability: Use Temporary Sediment Traps for disturbed areas where the contributing drainage area is 5 acres or less.
Refer to the Rhode Island Soil Erosion Control Handbook - Section Six: Sediment Control Measures - Temporary Sediment Traps

GREEN development, LLC

3760 Quaker Lane
North Kingstown, RI 02858
(401) 295-4998
www.green-ri.com

Sediment Trap # 3

Drainage Area (DA) = 4.891 Acres

Required Sediment Storage Volume Calculation; V= DA x 1"
(RISDISM Standard 10 V = **17,754 cu.ft.**
Requires 1" runoff Volume)

Wet Storage Volume Calculation; Vw= 0.85 x Aw x Dw
Vw= 8,884 cu.ft.
Wet Storage Volume Check = Vw > 0.5 V Ok

Dry Storage Volume Calculation; Vd= [(Aw + Ad)/2] * Dd
Vd= 11,161 cu.ft.

Provided Sediment Storage Volume **V= 20,045 cu.ft.**

Sediment Trap Details

	Abbr	Value	Unit
Wet Storage Depth	Dw	1.0	feet
Dry Storage Depth	Dd	1.0	feet
Total Depth	D	2.0	feet
Bottom of Trap Area	Ab	9,060	sq.ft
Wetted Surface Area	Aw	10,452	sq.ft
Surface Area at Outlet	Ad	11,869	sq.ft

Sediment Trap # 4

Drainage Area (DA) = 4.984 Acres

Required Sediment Storage Volume Calculation; V= DA x 1"
(RISDISM Standard 10 V = **18,092 cu.ft.**
Requires 1" runoff Volume)

Wet Storage Volume Calculation; Vw= 0.85 x Aw x Dw
Vw= 9,092 cu.ft.
Wet Storage Volume Check = Vw > 0.5 V Ok

Dry Storage Volume Calculation; Vd= [(Aw + Ad)/2] * Dd
Vd= 11,235 cu.ft.

Provided Sediment Storage Volume **V= 20,327 cu.ft.**

Sediment Trap Details

	Abbr	Value	Unit
Wet Storage Depth	Dw	1.0	feet
Dry Storage Depth	Dd	1.0	feet
Total Depth	D	2.0	feet
Bottom of Trap Area	Ab	9,645	sq.ft
Wetted Surface Area	Aw	10,697	sq.ft
Surface Area at Outlet	Ad	11,773	sq.ft

TEMPORARY SEDIMENT TRAP CALCULATIONS

Applicability: Use Temporary Sediment Traps for disturbed areas where the contributing drainage area is 5 acres or less.
Refer to the Rhode Island Soil Erosion Control Handbook - Section Six: Sediment Control Measures - Temporary Sediment Traps

GREEN development, LLC

3760 Quaker Lane
North Kingstown, RI 02858
(401) 295-4998
www.green-ri.com

Sediment Trap # 5

Drainage Area (DA) = 2.753 Acres

Required Sediment Storage Volume Calculation; V= DA x 1"
(RISDISM Standard 10 V = **9,993 cu.ft.**
Requires 1" runoff Volume)

Wet Storage Volume Calculation; Vw= 0.85 x Aw x Dw
Vw= 5,009 cu.ft.
Wet Storage Volume Check = Vw > 0.5 V Ok

Dry Storage Volume Calculation; Vd= [(Aw + Ad)/2] * Dd
Vd= 6,233 cu.ft.

Provided Sediment Storage Volume **V= 11,242 cu.ft.**

Sediment Trap Details

	Abbr	Value	Unit
Wet Storage Depth	Dw	1.0	feet
Dry Storage Depth	Dd	1.0	feet
Total Depth	D	2.0	feet
Bottom of Trap Area	Ab	5,239	sq.ft
Wetted Surface Area	Aw	5,893	sq.ft
Surface Area at Outlet	Ad	6,572	sq.ft

Sediment Trap # 6

Drainage Area (DA) = 3.694 Acres

Required Sediment Storage Volume Calculation; V= DA x 1"
(RISDISM Standard 10 V = **13,409 cu.ft.**
Requires 1" runoff Volume)

Wet Storage Volume Calculation; Vw= 0.85 x Aw x Dw
Vw= 6,716 cu.ft.
Wet Storage Volume Check = Vw > 0.5 V Ok

Dry Storage Volume Calculation; Vd= [(Aw + Ad)/2] * Dd
Vd= 8,272 cu.ft.

Provided Sediment Storage Volume **V= 14,988 cu.ft.**

Sediment Trap Details

	Abbr	Value	Unit
Wet Storage Depth	Dw	1.0	feet
Dry Storage Depth	Dd	1.0	feet
Total Depth	D	2	feet
Bottom of Trap Area	Ab	7,184	sq.ft
Wetted Surface Area	Aw	7,901	sq.ft
Surface Area at Outlet	Ad	8,643	sq.ft

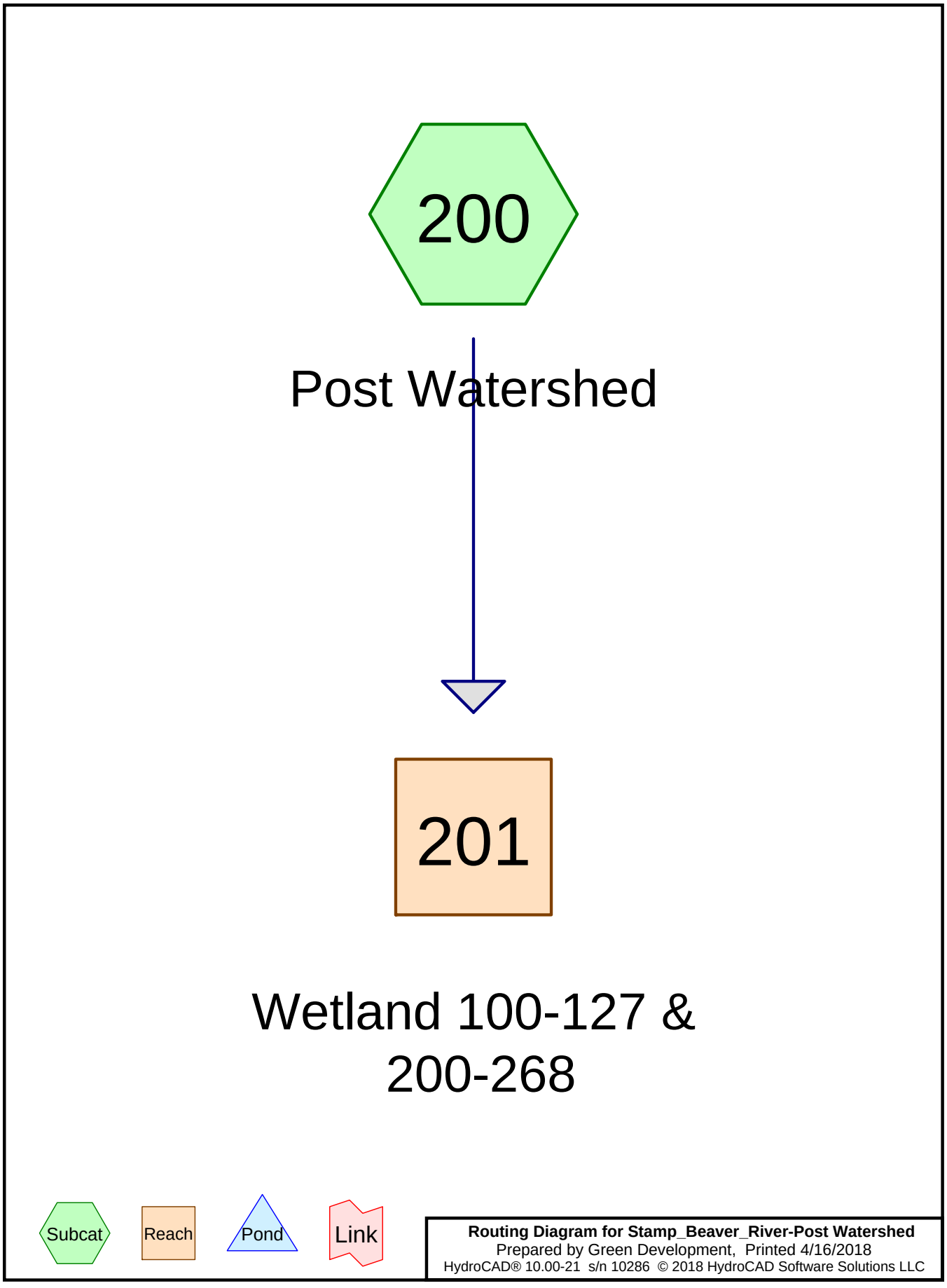
Appendix D: HydroCAD

D-1 HydroCAD Diagram

Wetland 100-127 &
200-268

Subcat Reach Pond Link

Routing Diagram for Stamp_Beaver_River-Pre Watershed
Prepared by Green Development, Printed 4/16/2018



Routing Diagram for Stamp_Beaver_River-Post Watershed
Prepared by Green Development, Printed 4/16/2018

D-2 1.2” Water Quality Storm Analysis

Summary for Subcatchment 100: Pre Watershed

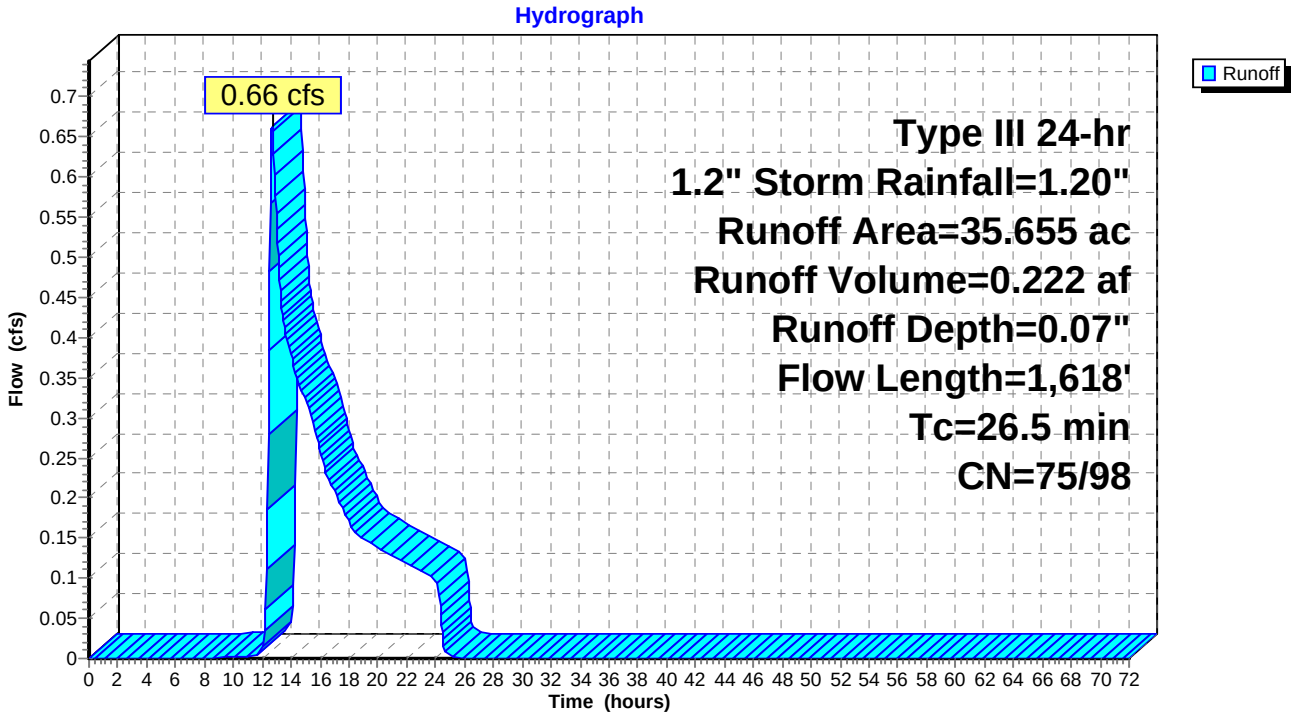
Runoff = 0.66 cfs @ 12.69 hrs, Volume= 0.222 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 1.2" Storm Rainfall=1.20"

	Area (ac)	CN	Description
*	0.042	98	Impervious
	8.469	67	Row crops, straight row, Good, HSG A
	20.308	78	Row crops, straight row, Good, HSG B
	1.650	85	Row crops, straight row, Good, HSG C
	0.828	89	Row crops, straight row, Good, HSG D
	0.000	30	Woods, Good, HSG A
	1.277	55	Woods, Good, HSG B
	0.631	70	Woods, Good, HSG C
	1.818	77	Woods, Good, HSG D
	0.632	61	>75% Grass cover, Good, HSG B
	35.655	75	Weighted Average
	35.613	75	99.88% Pervious Area
	0.042	98	0.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	120	0.0333	0.22		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.30"
12.2	943	0.0064	1.29		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
2.3	272	0.0147	1.95		**Shallow Concentrated Flow, C-D** Unpaved Kv= 16.1 fps
2.6	235	0.0085	1.48		**Shallow Concentrated Flow, D-E** Unpaved Kv= 16.1 fps
0.3	48	0.0208	2.32		**Shallow Concentrated Flow, E-F** Unpaved Kv= 16.1 fps
26.5	1,618	Total			

Subcatchment 100: Pre Watershed

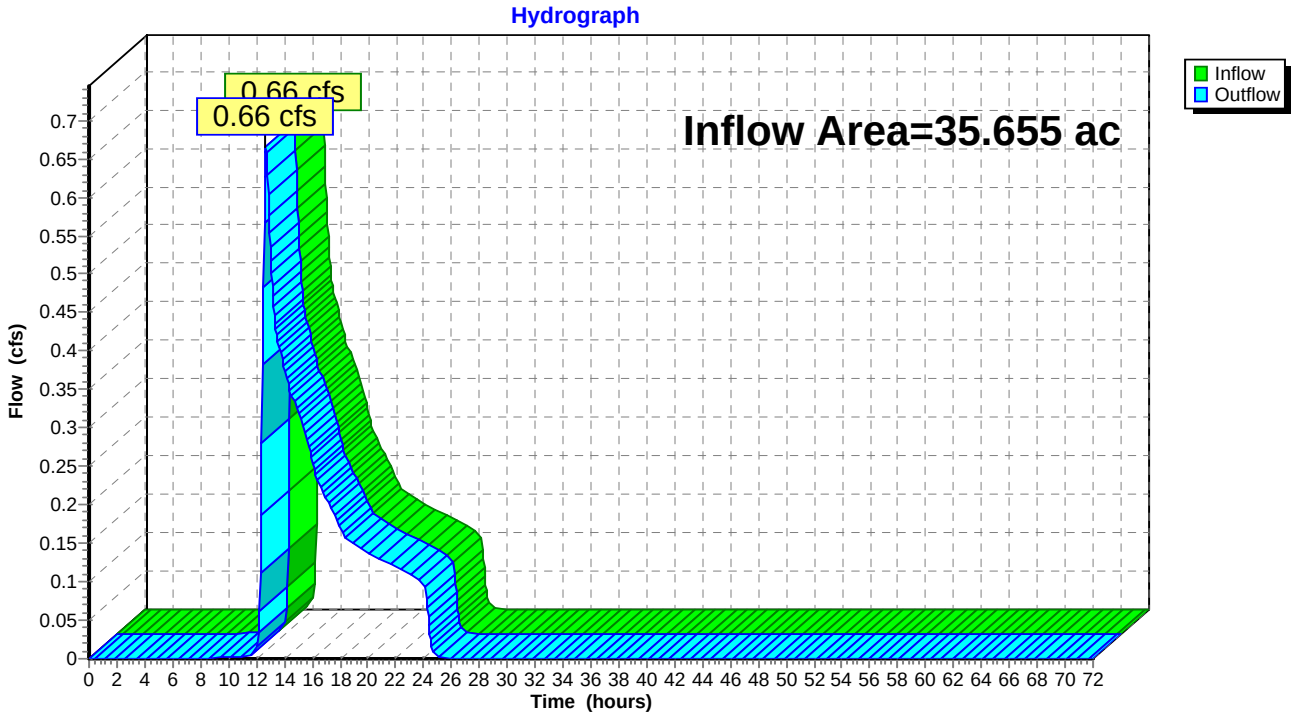


Summary for Reach 101: Wetland 100-127 & 200-268

Inflow Area = 35.655 ac, 0.12% Impervious, Inflow Depth = 0.07" for 1.2" Storm event
Inflow = 0.66 cfs @ 12.69 hrs, Volume= 0.222 af
Outflow = 0.66 cfs @ 12.69 hrs, Volume= 0.222 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 101: Wetland 100-127 & 200-268



Summary for Subcatchment 200: Post Watershed

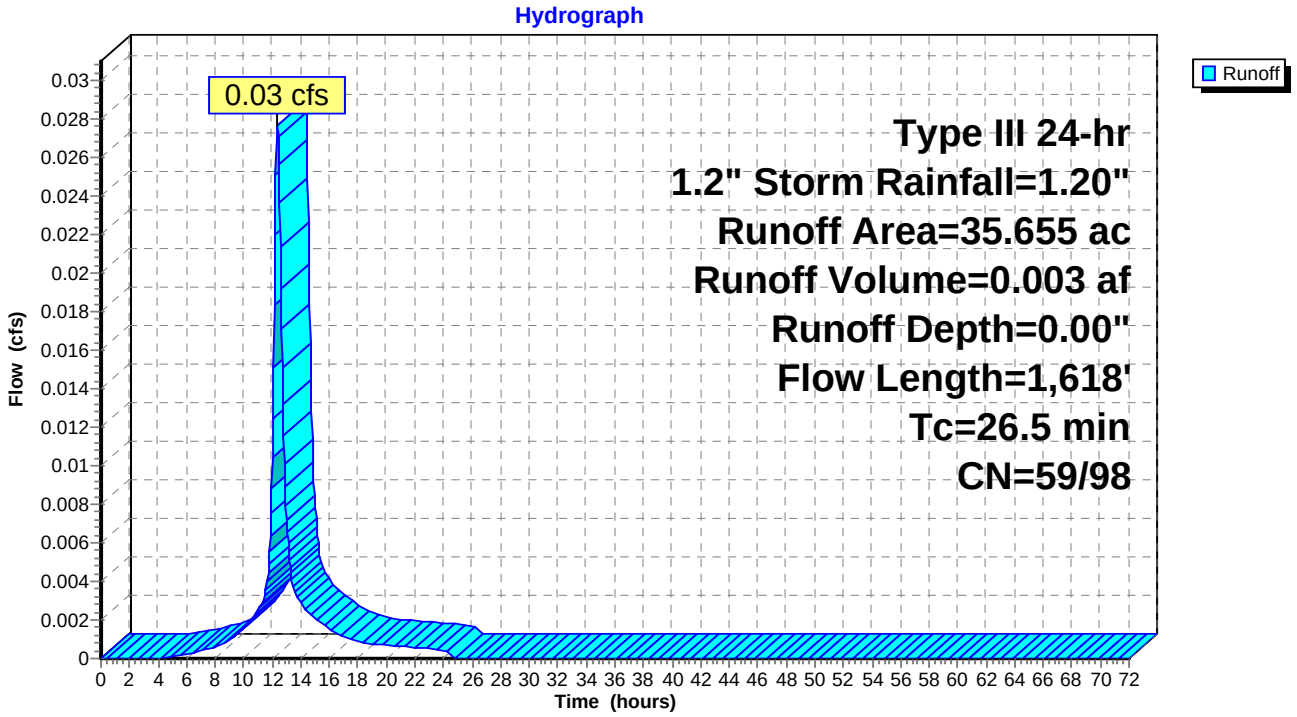
Runoff = 0.03 cfs @ 12.35 hrs, Volume= 0.003 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 1.2" Storm Rainfall=1.20"

	Area (ac)	CN	Description
*	0.042	98	Impervious
	8.067	39	>75% Grass cover, Good, HSG A
	20.371	61	>75% Grass cover, Good, HSG B
	1.650	74	>75% Grass cover, Good, HSG C
	0.828	80	>75% Grass cover, Good, HSG D
	1.277	55	Woods, Good, HSG B
	0.631	70	Woods, Good, HSG C
	1.818	77	Woods, Good, HSG D
	0.378	96	Gravel surface, HSG A
	0.593	96	Gravel surface, HSG B
	35.655	59	Weighted Average
	35.613	59	99.88% Pervious Area
	0.042	98	0.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	120	0.0333	0.22		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.30"
12.2	943	0.0064	1.29		**Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps
2.3	272	0.0147	1.95		**Shallow Concentrated Flow, C-D** Unpaved Kv= 16.1 fps
2.6	235	0.0085	1.48		**Shallow Concentrated Flow, D-E** Unpaved Kv= 16.1 fps
0.3	48	0.0208	2.32		**Shallow Concentrated Flow, E-F** Unpaved Kv= 16.1 fps
26.5	1,618	Total			

Subcatchment 200: Post Watershed

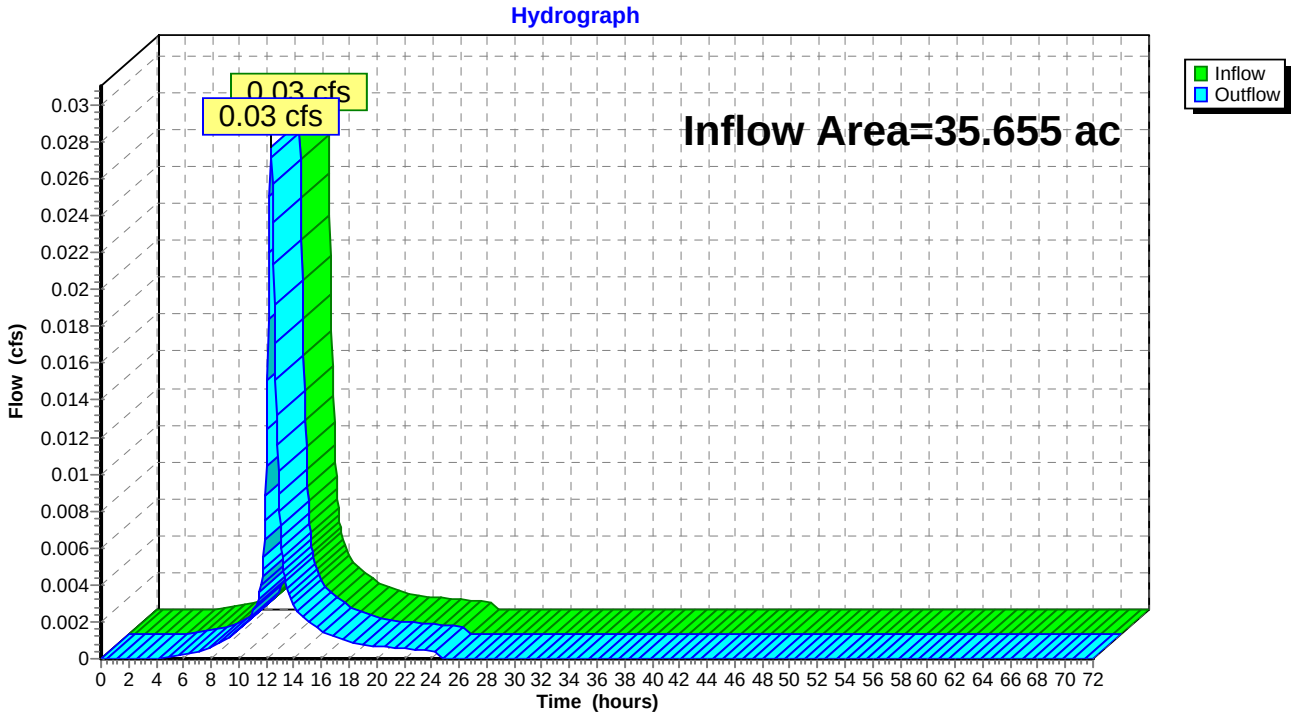


Summary for Reach 201: Wetland 100-127 & 200-268

Inflow Area = 35.655 ac, 0.12% Impervious, Inflow Depth = 0.00" for 1.2" Storm event
Inflow = 0.03 cfs @ 12.35 hrs, Volume= 0.003 af
Outflow = 0.03 cfs @ 12.35 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 201: Wetland 100-127 & 200-268



D-3 1-Year Storm Analysis

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: Pre Watershed Runoff Area=35.655 ac 0.12% Impervious Runoff Depth=0.83"
Flow Length=1,618' Tc=26.5 min CN=75 Runoff=19.23 cfs 2.474 af

Reach 101: Wetland 100-127 & 200-268 Inflow=19.23 cfs 2.474 af
Outflow=19.23 cfs 2.474 af

Total Runoff Area = 35.655 ac Runoff Volume = 2.474 af Average Runoff Depth = 0.83"
99.88% Pervious = 35.613 ac 0.12% Impervious = 0.042 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 200: Post Watershed Runoff Area=35.655 ac 0.12% Impervious Runoff Depth=0.24"
Flow Length=1,618' Tc=26.5 min CN=59 Runoff=2.86 cfs 0.707 af

Reach 201: Wetland 100-127 & 200-268 Inflow=2.86 cfs 0.707 af
Outflow=2.86 cfs 0.707 af

Total Runoff Area = 35.655 ac Runoff Volume = 0.707 af Average Runoff Depth = 0.24"
99.88% Pervious = 35.613 ac 0.12% Impervious = 0.042 ac

D-4 10-Year Storm Analysis

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: Pre Watershed Runoff Area=35.655 ac 0.12% Impervious Runoff Depth=2.37"
Flow Length=1,618' Tc=26.5 min CN=75 Runoff=58.70 cfs 7.037 af

Reach 101: Wetland 100-127 & 200-268 Inflow=58.70 cfs 7.037 af
Outflow=58.70 cfs 7.037 af

Total Runoff Area = 35.655 ac Runoff Volume = 7.037 af Average Runoff Depth = 2.37"
99.88% Pervious = 35.613 ac 0.12% Impervious = 0.042 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 200: Post Watershed Runoff Area=35.655 ac 0.12% Impervious Runoff Depth=1.18"
Flow Length=1,618' Tc=26.5 min CN=59 Runoff=25.62 cfs 3.500 af

Reach 201: Wetland 100-127 & 200-268 Inflow=25.62 cfs 3.500 af
Outflow=25.62 cfs 3.500 af

Total Runoff Area = 35.655 ac Runoff Volume = 3.500 af Average Runoff Depth = 1.18"
99.88% Pervious = 35.613 ac 0.12% Impervious = 0.042 ac

D-5 100-Year Storm Analysis

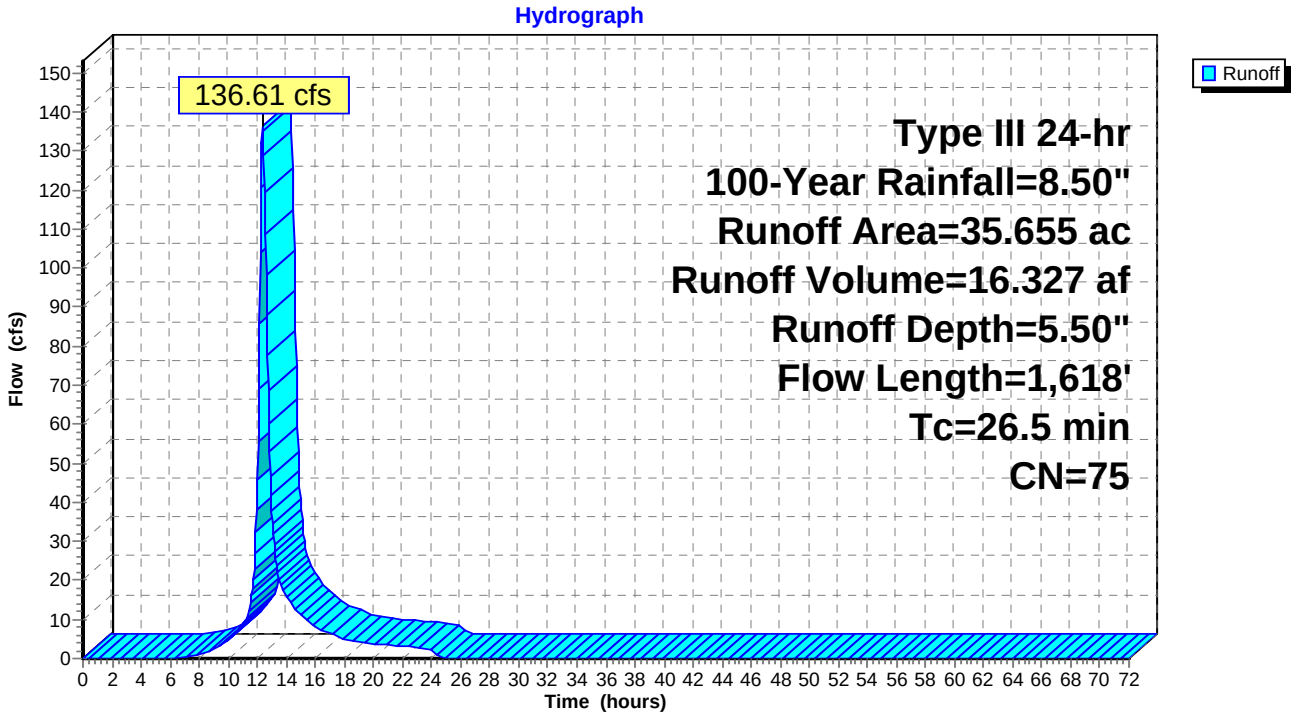
Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment100: Pre Watershed Runoff Area=35.655 ac 0.12% Impervious Runoff Depth=5.50"
Flow Length=1,618' Tc=26.5 min CN=75 Runoff=136.61 cfs 16.327 af

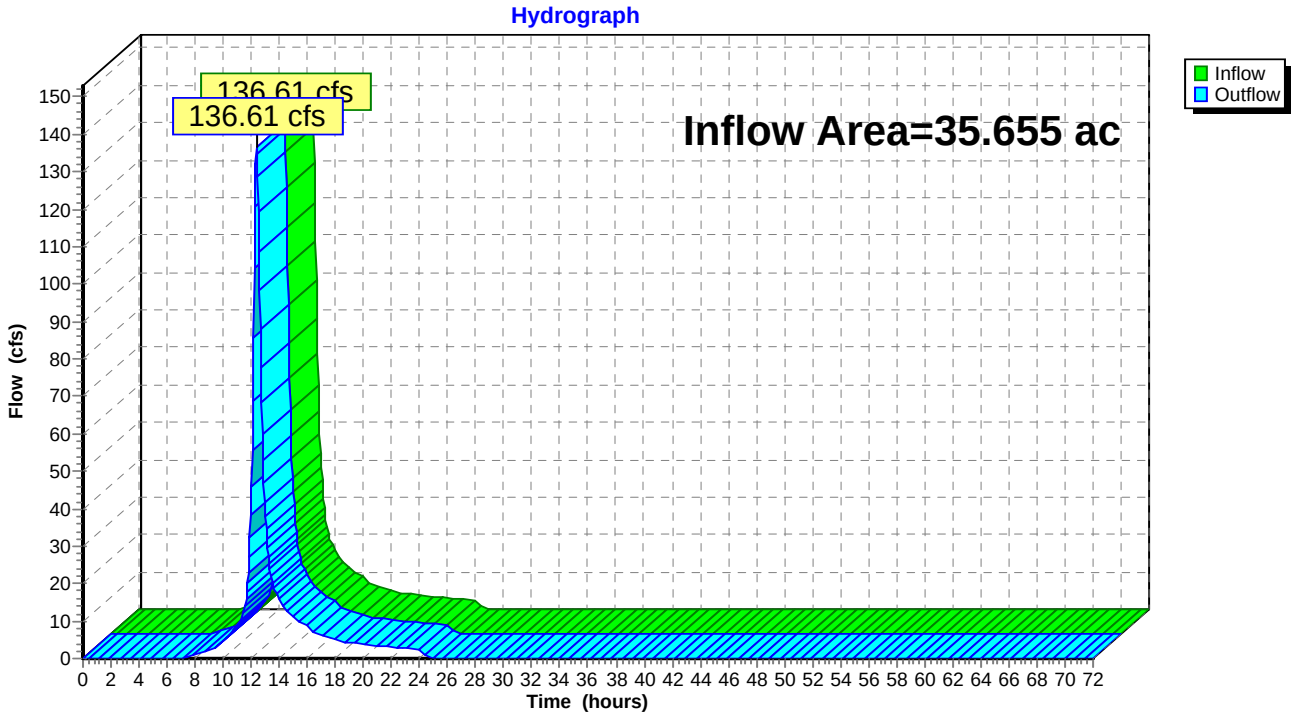
Reach 101: Wetland 100-127 & 200-268 Inflow=136.61 cfs 16.327 af
Outflow=136.61 cfs 16.327 af

Total Runoff Area = 35.655 ac Runoff Volume = 16.327 af Average Runoff Depth = 5.50"
99.88% Pervious = 35.613 ac 0.12% Impervious = 0.042 ac

Subcatchment 100: Pre Watershed



Reach 101: Wetland 100-127 & 200-268



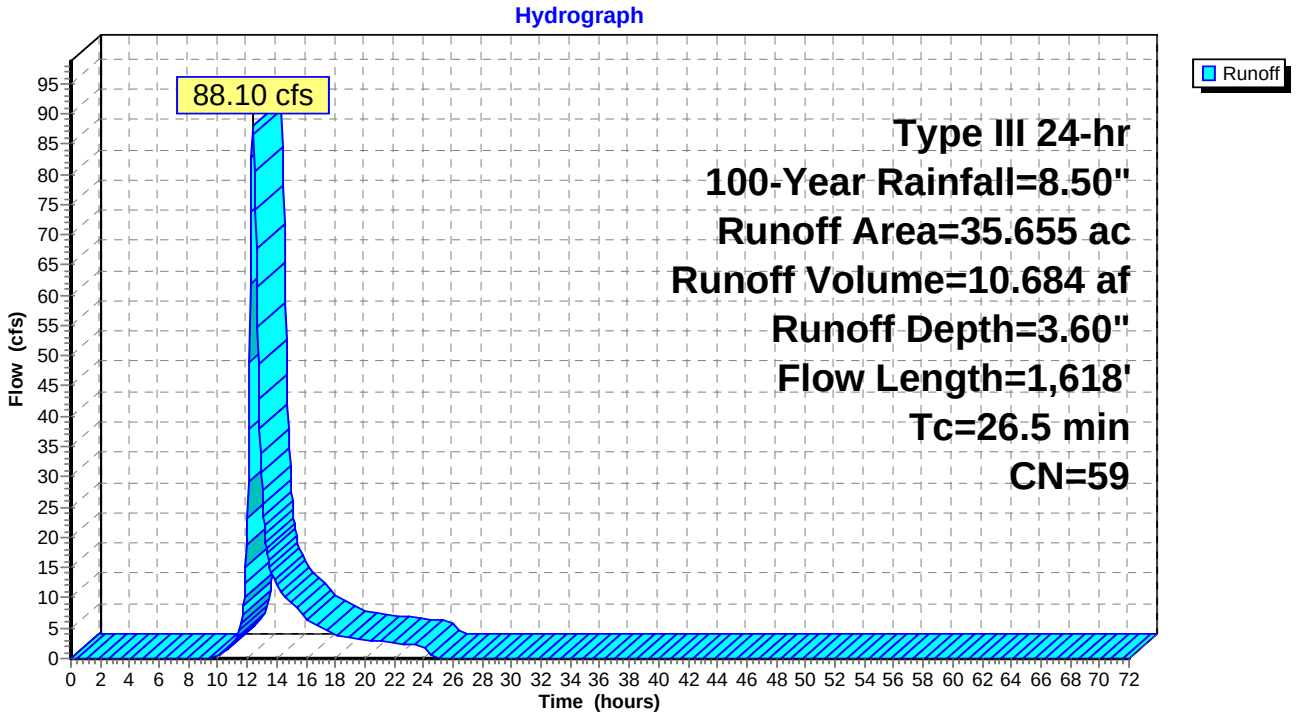
Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 200: Post Watershed Runoff Area=35.655 ac 0.12% Impervious Runoff Depth=3.60"
Flow Length=1,618' Tc=26.5 min CN=59 Runoff=88.10 cfs 10.684 af

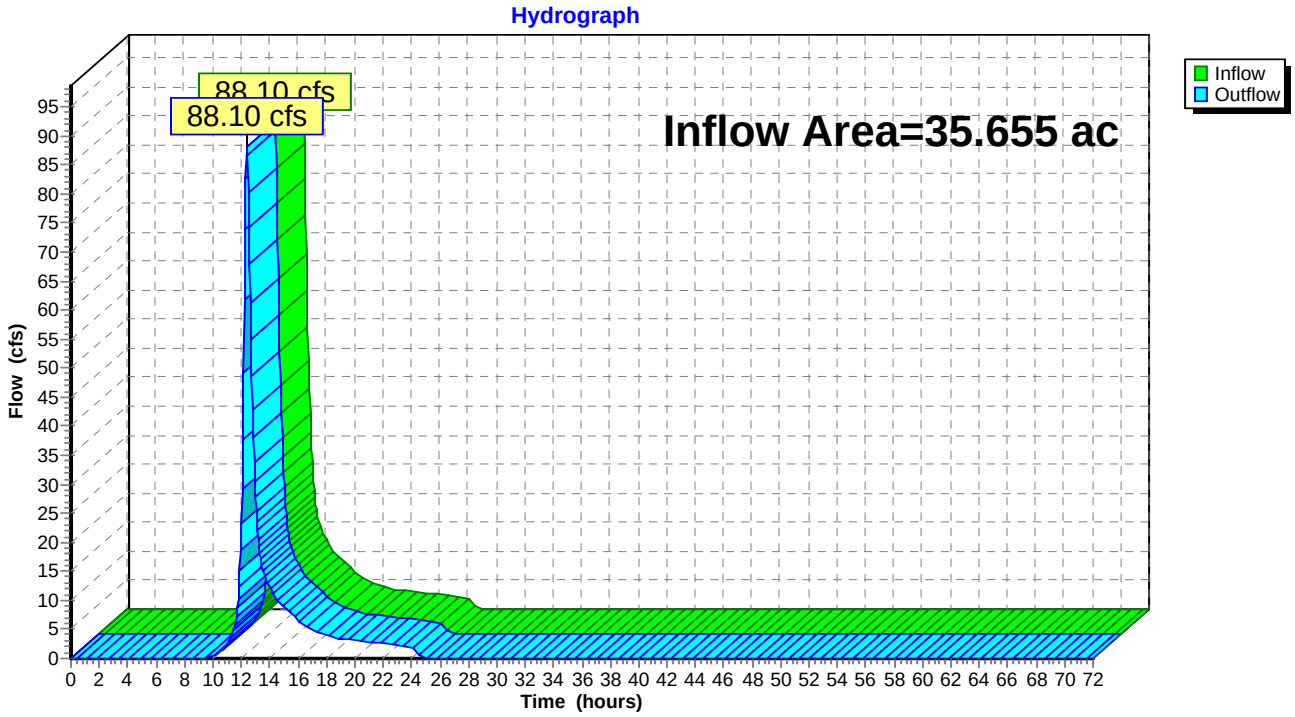
Reach 201: Wetland 100-127 & 200-268 Inflow=88.10 cfs 10.684 af
Outflow=88.10 cfs 10.684 af

Total Runoff Area = 35.655 ac Runoff Volume = 10.684 af Average Runoff Depth = 3.60"
99.88% Pervious = 35.613 ac 0.12% Impervious = 0.042 ac

Subcatchment 200: Post Watershed



Reach 201: Wetland 100-127 & 200-268



Appendix E: Watershed Maps

08/02/2018
09:21:05 AM
6 Pages
DECISION
Bk: 321 Pg: 868

Town of Richmond, Rhode Island
5 Richmond Townhouse Road, Wyoming, RI 02898
www.richmondri.com

RICHMOND ZONING BOARD OF REVIEW
DECISION

Petitioner: **G.D. Richmond Beaver River I, LLC**, 3760 Quaker Lane, North Kingstown, RI 02852
Premises: 172 Beaver River Road, Richmond, Tax Assessor's Plat 8-E, Lot 12
Zoning District: R-3 (Residential 3-acre)
Applicable Sections of the Richmond Zoning Ordinance: Sections 18.60.020 and 18.60.030 (Appeal of zoning enforcement officer's determination); Chapter 18.34 (Solar Energy Systems); Section 18.52.060 (Special use permits).

The Zoning Board of Review conducted a public hearing on this petition on July 23, 2018. After the Board closed the public hearing, the Board voted to continue the petition to August 1, 2018 for a decision. On August 1, 2018, the Board denied the appeal because, based on the following findings of fact and conclusions of law, the appeal was not timely filed.

Findings of Fact

1. The appellant, G.D. Richmond Beaver River I, LLC, submitted an application to the Zoning Board of Review clerk on May 15, 2018. The application requested a special use permit to construct a commercial solar energy system on a 43.67-acre lot in the R-3 zoning district and an advisory development plan review by the Planning Board, which is required for a commercial solar system in the R-3 zoning district. The application also appealed a determination by the Zoning Enforcement Officer, Russell W. Brown, contained in a memorandum dated April 2, 2018 addressed to the Town Planner, Juliana Berry. The application was accompanied by an application fee, a radius map and list of the names and addresses of the owners of property within 200 feet of the subject property, and material describing the proposed project at 172 Beaver River Road.

2. Under Section 18.16.010 of the zoning ordinance, a solar energy system (use code 506) is allowed by special use permit in the R-3 zoning district subject to the conditions in Chapter 18.34, entitled Solar Energy Systems.

3. Section 18.34.040 of the zoning ordinance says in part:

> 18.34.040 Procedure for approval of a special permit use. The zoning board of review shall ask the planning board to conduct an advisory development plan review before the zoning board of review renders a decision on an application for a special use permit for a solar energy system.
>
> A. The applicant shall submit an application for development plan review to the administrative officer at the same time the applicant submits an application to the zoning board of review for a special use permit.

4. On March 29, 2018, in preparation for submission of the G. D. Richmond Beaver River I special use permit application, Kevin Morin, P.E., a representative of Green Development, LLC, a related firm, attended a pre-submission conference on the development plan review application with Ms. Berry, the Town Planner. Mr. Morin electronically submitted application materials to Ms. Berry before the pre-submission meeting.

5. Ms. Berry testified that she was directed by the applicant to communicate with Mr. Morin concerning the proposed project.

6. On March 29, 2018, Section 18.34.030 said, in part:

> 18.34.030 Requirements for a special permit use. The following requirements shall apply to a solar energy system that is allowed by special use permit in the zoning district.
>
> A. The solar energy system shall be within two (2) miles of a utility substation.

7. After her pre-submission meeting with Mr. Morin, Ms. Berry asked Mr. Brown, the Zoning Enforcement Officer, for his opinion on whether Section 18.34.030(A) required an entire solar energy system to be located within two miles of a utility substation.

8. In a memorandum addressed to Ms. Berry dated April 2, 2018, Mr. Brown wrote:

> You have asked if a lot or parcel of land in an R-3 zoning district has a portion of that lot or parcel within two (2) miles of a utility substation, can the remaining portion of the lot or parcel of land that is outside of the two (2) mile radius be used as a solar energy system? 18.34.030 (A) is very clear that the solar energy system must be located within two (2) miles of a utility substation. Therefore any area outside of the two (2) miles radius cannot be used as a solar energy system.

9. Ms. Berry forwarded Mr. Brown's memorandum to Mr. Morin by e-mail on April 2, 2018 at 11:40 a.m.

10. On April 2, 2018, the G. D. Richmond Beaver River I solar project planned for 172 Beaver River Road was Green Development's only project in Richmond.

11. Green Development did not explicitly confirm to Ms. Berry that her April 2 e-mail had been received, but Michelle Carpenter, an official at Green Development, replied to Ms. Berry's April 2 e-mail on April 5. The reply e-mail inquired about the status of a proposed amendment to Section 18.34.030(A). The reply e-mail is evidence that Ms. Carpenter understood the significance of the language in Section 18.34.030(A) to the viability of the G. D. Richmond Beaver River I application.

12. Mr. Morin, the engineer who prepared the G. D. Richmond Beaver River I application, testified that after he saw the zoning enforcement officer's April 2 determination, he thought that G.D. Richmond Beaver River I might have to request a variance rather than a special use permit. His testimony is evidence that he understood the significance of the language in Section 18.34.030(A) to the viability of the G. D. Richmond Beaver River I application.

13. Officials at Green Development knew or should have known by April 5, 2018 at the latest that the zoning enforcement officer's April 2 determination concerning the requirements of Section 18.34.030(A) would affect the viability of the project planned for 172 Beaver River Road.

14. John O. Mancini, a lawyer representing G. D. Richmond Beaver River I, addressed a letter to the Zoning Board of Review dated April 16, 2018 that said, in part:

> The purpose of this correspondence is to specifically appeal pursuant to R.I. Gen. Laws § 45-24-64 that decision as issued by Russell Brown, Zoning Enforcement Officer ("Zoning Enforcement Officer") relating to Section 18.34.030(A), location of a solar energy system. Specifically, the Zoning Enforcement Officer on April 2, 2018 interpreted Section 18.34.030 (A) as indicating that a solar energy system must be located *entirely* within 2 miles of a utility substation. Accordingly, the Applicant disagrees and disputes the Zoning Enforcement Officer's decision and asserts that the same is incorrect and does not comport with the plain meaning of the Ordinance.

Mr. Mancini did not offer any evidence or testimony concerning when the letter was delivered, how it was delivered, or to whom it was delivered.

15. Mr. Mancini's correspondence to the Zoning Board of Review dated April 16, 2018 was not delivered to the zoning board clerk until May 15, 2018, when the zoning board clerk received it as one of the enclosures with the application form.

16. Mr. Mancini introduced into evidence, as Appellant's Exhibit A, a letter dated April 20, 2018 from himself to Town Solicitor Karen Ellsworth concerning his client's appeal. Attached were a copy of the April 2, 2018 determination and a copy of the April 16, 2018 correspondence addressed to the Zoning Board of Review. Mr. Mancini did not offer any evidence or testimony concerning when the letter was delivered, how it was delivered, or to whom it was delivered.

17. Mr. Mancini introduced into evidence, as Appellant's Exhibit B, a Letter of Transmittal form dated April 19, 2018 from Green Development addressed to the attention of Russell W. Brown, Zoning Official, and as Appellant's Exhibit C, a Letter of Transmittal form dated April 19, 2018 from Green Development addressed to the attention of Juliana Berry, Town Planner. Mr. Mancini did not offer any evidence or testimony concerning how the forms were transmitted, to whom they were transmitted, or what was transmitted with the forms.

18. Although Appellant's Exhibits B and C, the transmittal forms, were dated April 19, the zoning board clerk did not receive and stamp them until May 15.

Conclusions of Law

A. Section 18.60.020 of the zoning ordinance says in part:

> 18.60.020 Appeal of zoning enforcement officer's determination.
>
> A. An aggrieved party shall have the right to appeal a decision or violation notice by the zoning enforcement officer to the zoning board of review. The appeal shall be taken within thirty (30) days from the date the appellant received the decision or violation notice or the date on which the appellant knew or should have known of the decision or violation notice.

B. Mr. Morin and Ms. Carpenter, the officials at Green Development who were responsible for the G. D. Richmond Beaver River I special use permit application, knew about the zoning enforcement officer's April 2 determination by April 5 at the latest, and knew or should have known by April 5 at the latest that the determination would affect the viability of the G. D. Richmond Beaver River I project.

C. Section 18.08.010 of the zoning ordinance, entitled Definitions, says in part:

> Aggrieved party.

A. Any person or persons or entity or entities who can demonstrate that his or her property will be injured by a decision of any officer or agency responsible for administering the zoning ordinance; or

B. Anyone requiring notice pursuant to R.I. Gen. Laws title 45, ch. 24.

D. The appellant, G. D. Richmond Beaver River I, was an aggrieved party, and therefore entitled to appeal Mr. Brown's April 2, 2018 determination, by April 5, 2018 at the latest.

E. Section 18.60.020 of the zoning ordinance says in part:

18.60.020 Appeal of zoning enforcement officer's determination.

B. An aggrieved party appealing a decision or violation notice shall complete a form provided by the clerk of the zoning board of review. A copy of the decision or violation notice shall be filed with the appeal.

F. Section 18.52.030 of the zoning ordinance says in part:

18.52.030 Application. Applications to the zoning board of review shall be submitted, and notice shall be given, in the following manner:

A. Applicants for variances and special use permits, and persons appealing an order, requirements, decision, or determination of the zoning enforcement officer or any other town official charged with the enforcement or interpretation of this Title, shall complete a form provided by the clerk of the zoning board of review. The applicant shall submit the following to the clerk of the zoning board of review:

1. The completed application form.
2. The fee required by Ch. 3.06 of the Richmond Code of Ordinances.
3. Any supplemental material required by this title, by the zoning board of review rules of procedure for the submission and consideration of petitions, or by the instructions on the form.
4. A copy of a portion of a Richmond tax assessor's map showing the property that is the subject of the application and all property within two hundred (200) feet of the subject property.
5. A list of the last known names and addresses of the owners of all property within two hundred (200) feet of the subject property, as shown on the current real estate tax assessment records.

G. There is no evidence in the record that at any time before May 15, Mr. Mancini's April 16, 2018 correspondence to the Zoning Board of Review was delivered to the zoning board clerk or that it was accompanied by an application form and the other application materials required by Sections 18.52.020 and 18.52.030 of the zoning ordinance.

H. An appeal that was submitted to anyone other than the zoning board clerk, or an appeal that was not accompanied by the application material required by Sections 18.52.020 and 18.52.030, would not satisfy the requirements of the zoning ordinance concerning filing of an appeal from a determination of the zoning enforcement officer.

I. Neither G. D. Richmond Beaver River I, Green Development, or anyone acting on their behalf submitted an appeal of the zoning enforcement officer's April 2 determination to the Zoning Board of Review clerk within thirty days of April 5, 2018.

Based on the above findings of fact and conclusions of law, the Zoning Board of Review finds that the May 15, 2018 appeal of G. D. Richmond Beaver River I was not timely filed.

Cynthia Davis, moved that the appeal be denied based on the above findings of fact and conclusions of law. Sean Carney seconded the motion. Voting in favor of the motion: Vincent Rinaldi, Jr., Cynthia Davis, Sean Carney, Jeffrey Vaillancourt, and Second Alternate Bruce Lane.

Vincent Rinaldi, Jr., Chair
Date: August 1, 2018

Section 18.34.030 prior to amendment on 15 May 2018

18.34.030 Requirements for a special permit use. The following requirements shall apply to a solar energy system that is allowed by special use permit in the zoning district.

A. The solar energy system shall be within two (2) miles of a utility substation.

B. The security fence shall be located 25 feet from the perimeter of the solar energy system.

C. The minimum front, side and rear yards required in the zoning district by Sec. 18.20.010 shall not apply. The front, side and rear yards shall be at least fifty (50) feet, measured from the property line to the perimeter of the solar energy system.

D. A vegetative buffer at least twenty-five (25) feet wide shall be maintained between the security fence and the boundaries of the lot. The zoning board of review shall have the authority to require a wider vegetative buffer if there is sufficient competent evidence in the record to support the increase.

E. The lot or parcel must be large enough to accommodate a solar energy system that covers at least eleven (11) contiguous acres that are not within the jurisdictional boundaries of a wetland, as that phrase is defined in the current R.I. department of environmental management rules and regulations governing the administration and enforcement of the freshwater wetlands act.

F. A solar energy system shall not be located on a lot that is protected from development by a conservation easement, preservation easement, or deed restriction, or on a lot or portion of a lot that is classified by the tax assessor as farm land, forest land, or open space land pursuant to title 44, chapter 27 of the general laws.
(Ord. dated 7-25-17)

Section 18.34.030 as amended on 15 May 2018

18.34.030 Requirements for a special permit use. The following requirements shall apply to a solar energy system that is allowed by special use permit in the zoning district.

A. The entire lot on which the solar energy system is located shall be within two (2) miles of a utility substation.

B. The security fence shall be located 25 feet from the perimeter of the solar energy system.

C. The minimum front, side and rear yards required in the zoning district by Sec. 18.20.010 shall not apply. The front, side and rear yards shall be at least fifty (50) feet, measured from the property line to the perimeter of the solar energy system.

D. A vegetative buffer at least twenty-five (25) feet wide shall be maintained between the security fence and the boundaries of the lot. The zoning board of review shall have the authority

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(Ord. dated 7-25-17; Ord. dated 5-15-18)

Town of Richmond, Rhode Island
5 Richmond Townhouse Road, Wyoming, RI 02898
www.richmondri.com

Planning Board
June 11, 2019

STAFF REPORT

Advisory Development Plan Review of applicant GD Beaver River I, LLC to construct a 5.3 MW AC ground-mounted solar energy system located at 172 Beaver River Road, Plat 8E Lot 12, zoned R-3 and requiring a recommendation to the Zoning Board of Review for the Special Use Permit application

*Plat/Lot: 8E Lot 12
*Address: 172 Beaver River Road, Richmond, RI 02812
*Zone: Residential R-3
*Acreage: 44 acres (approximate)
*Current Use: Single-family residential, agriculture
*Proposed Use: 5.3 MW AC ground-mounted solar energy system
*Owner: William M. Stamp, Trustee
*Applicant: GD Richmond Beaver River I, LLC

Recommended Board Action
Provide an advisory Development Plan Review opinion to the Zoning Board of Review for its consideration. The opinion shall state whether the Planning Board finds that the applicant's plan for the site complies with the purposes, standards and requirements of the Zoning Ordinance and is consistent with the Comprehensive Community Plan. If applicable, the Planning Board may recommend any conditions to the Zoning Board of Review for the special use permit application.

A Board motion is needed to recommend a financial guarantee amount for the facility's removal and site restoration upon cessation of operations.

Project Overview
The applicant proposes a 5.3 MW AC ground-mounted solar energy system located at 172 Beaver River Road, encompassing approximately 24 acres. The project area is accessed from Beaver River Road. The project includes 20,700 (360-watt) solar panels on racking systems. The panels will be approximately nine to 12 feet in height, and includes five transformers and 10 inverters. Utilities shall be underground to the extent possible. No outdoor lighting is proposed.

The parcel is approximately 44 acres in area and largely cleared. There is a single-family residential house on the property. The zone for the subject property and its surroundings is R-3. The southern-most portion of the property is wooded. GIS data indicates the presence of wetlands and Flood Zones A and X along the Beaver Riverbank. The property has a Farm, Forest and Open Space (FFOS) designation associated with it. The parcel is not located within a Natural Heritage Area. The parcel is located within Aquifer Protection Overlay and Agricultural Overlay Districts. The surrounding area along Beaver River Road is characterized by single-family residential dwellings and lands historically used for agriculture.

Beaver River Road is a unique corridor within the town. The Comprehensive Community Plan designates the southern portion of Beaver River Road (including the subject property) as a local scenic area. In March of this year, federal legislation was signed dedicating the seven rivers (including the Beaver River) that comprise the Wood-Pawcatuck River watershed as a nationally-recognized Wild and Scenic River. This designation, established under the Wild and Scenic Rivers Act of 1968, affords special protections to safeguard water quality, fish and animal communities, and recreational resources. Due to its historic qualities, Beaver River Road is also eligible for listing on the National Register of Historic Places.

Background

The special use permit and development plan review applications date back to 2018. Following an internal review of the application, the town's Zoning Official determined that the project was not in compliance with the solar energy systems ordinance in that the project was not located entirely within a two-mile radius of a utility substation. Following that determination, the applicant filed an appeal of the Zoning Official's opinion, asserting that the application was in compliance with the solar energy systems ordinance.

The Zoning Board of Review considered the applicant's appeal on July 23, 2018 and August 1, 2018. It was determined that the applicant filed the appeal after the 30-day appeal window had expired. The Zoning Board of Review therefore upheld the Zoning Official's determination that the project was not in compliance with the solar energy systems ordinance.

The Zoning Board of Review's decision was subsequently appealed to the State Superior Court. Following deliberations, the court issued a consent order to remand the application back to the Zoning Board of Review for a full review of the special use permit and development plan review applications in accordance with the town's solar energy systems ordinance. A copy of the Zoning Board of Review's decision from August 1, 2018 is attached for reference.

Since the receipt of the initial applications in 2018, the solar energy systems ordinance was changed to provide greater clarity regarding the location of a solar energy system from the nearest utility substation (Sec. 18.34.030(A)). Excerpts of the previous and current versions of the solar energy systems ordinance are attached for reference.

Proposal and Analysis

The 5.3 MW AC ground-mounted solar energy system is proposed to encompass 24 acres throughout the property. The existing single-family residential structure would be removed for the purposes of the installation. The project provides a 20-foot wide permeable (gravel) access drive to the solar energy system from Beaver River Road. The access drive runs along the easterly side of the parcel, terminating at a hammerhead turnaround at the northeast end of the property and a dead end at the southeast end of property. A 16-foot high access gate and lockbox is located at the west end of the property at the entrance. The arrays will be enclosed with a six-foot high chainlink fence around the project perimeter. The fence would provide a six-inch clearance at its base for wildlife passage. Other site improvements include the installation of five concrete equipment pads and utilities, and areas for construction staging, soil erosion control and potential topsoil stockpiling. No removal of vegetation is proposed along the Beaver Riverbank. No exterior lighting is proposed.

The proposal includes a 25-foot wide vegetated buffer along the west side of the project area, adjacent to the street. Plantings include a combination of groundcover, shrubs and small trees. Stormwater best management practices consist of erosion and sediment control barriers around the project perimeter. Since the project is not anticipated to substantially affect current stormwater runoff patterns due to the current grade of the site, no additional drainage improvements are proposed. All areas located outside of the limit of disturbance remain unchanged.

Construction sequencing would include site work such as soil erosion and sedimentation control, installation of sediment swales and traps, grade stabilization, installation of the arrays and utilities, demolition of the existing structures on site, and fencing and landscaping. Upon completion of construction, conditions will be remotely monitored by the solar operator, and preventative maintenance through testing and inspections of equipment will be conducted periodically.

The project includes a decommissioning plan. The plan includes the removal of the arrays and utilities, fencing and on-site equipment. Upon removal of the equipment and utilities, the site would be restored to its natural state. All appropriate materials will be recycled, while all others properly disposed of. A peer review of the decommissioning plan and cost estimates were conducted by Crossman Engineering. A detailed summary of the decommissioning plan, cost estimates, and the peer-reviewed response letter with recommendations from Crossman Engineering, is attached for reference.

The project lacks an Interconnection Service Agreement between the applicant and National Grid. A transmission impact study is currently being conducted by National Grid to determine if the project is feasible to connect to nearby transmission infrastructure. The System Impact Study is attached for reference.

The subject site, along with other properties along Beaver River Road, are eligible for listing on the National Register of Historic Places. Due to the historic sensitivity associated with the project area, staff contacted the State Historic Preservation Office for an advisory

opinion as related to how the project may or may not affect the eligibility of Beaver River Road for future listing on the National Register of Historic Places. The State Historic Preservation Office concluded that the project would negatively impact the area's eligibility for future listing on the National Register of Historic Places. The Determination of Eligibility and response letter from the Rhode Island Historical Preservation & Heritage Commission are attached for reference.

Comprehensive Community Plan Consistency

The project is in conflict with the Comprehensive Community Plan in the following ways:

- *Natural and Cultural Resources – Policy NC6: Identify and maintain scenic rural landscapes, vistas, and key cultural and historic resources.* The Comprehensive Community Plan identifies the subject property and nearby surroundings as a local scenic area, while the property and its immediate surroundings are eligible for listing on the National Register of Historic Places. The proposed project would physically and visually alter the character-defining elements that comprise the pastoral setting of the area, which contribute directly towards its eligibility for inclusion on the National Register of Historic Places.
- *Natural and Cultural Resources – Policy NC2: Protect rare and unique natural resources.* The project abuts the Beaver River, which is one of seven rivers that contribute to the Wood-Pawcatuck River Watershed's federal designation as a Wild and Scenic River. The project would have an adverse effect on the scenic qualities associated with the Beaver River, and as a utility-scaled development, would be incompatible with the underlying rural, forested and agriculture-based setting of Beaver River Road.
- *Land Use - Goal LU 8: Encourage development that protects the town's historical and archaeological heritage.* The project is located within a historically-significant area. The expansive nature of the proposed limit of disturbance associated with the project, which encompasses nearly 24 acres, would negatively affect the underlying rural and agricultural setting that characterizes Beaver River Road as a local scenic area and a location eligible for inclusion on the National Register of Historic Places.

Zoning Ordinance Compliance

The project is not in compliance with Chapter 18.34 of the Zoning Ordinance. Only a portion of the project falls within the required two-mile radius of a utility substation, and the project lacks an Interconnection Service Agreement with National Grid.

The property has a Farm, Forest and Open Space (FFOS) designation associated with it. In accordance with Chapter 18.34.030(F), solar systems may not be permitted within properties classified by the tax assessor as farm land, forest land, or open space.

Correspondence

Staff received a letter on behalf of the Richmond Historical Society that expressed concerns about the siting of the arrays in context with the historic setting of the property and its immediate surroundings. The letter is attached for reference.

Summary

The application as presented is not consistent with the Comprehensive Community Plan and not in compliance with Chapter 18.34 of the Zoning Ordinance. Staff therefore recommends that the Planning Board provide a negative recommendation to the Zoning Board of Review for its consideration of the project.

Should the Planning Board wish to provide a positive recommendation to the Zoning Board of Review, a motion is needed to recommend a financial guarantee amount for the facility's removal and site restoration upon cessation of operations. The Planning Board may also suggest recommended conditions of approval for the Zoning Board of Review's consideration.

Attachments:

1. Application, Notification List, Owner's Authorization, Development Plan Review Checklist
2. Project narrative prepared by Green Development, LLC dated May 14, 2018
3. Letter from Mancini Carter PC dated April 20, 2018 (with exhibits)
4. Zoning Board of Review decision dated August 1, 2018
5. Excerpts of Section 18.34.030 prior to, and following, amendments dated May 15, 2018
6. Decommissioning plan dated April 2018
7. Decommissioning Plan Review Memorandum prepared by Crossman Engineering dated May 21, 2019
8. System Impact Study for Distributed Generation Interconnection to National Grid's 12.47 kV system, version 1.0 dated February 8, 2018
9. Determination of Eligibility Notification – National Register of Historic Places, dated October 16, 1995
10. Letter from Historical Preservation & Heritage Commission dated May 31, 2019
11. Soil Erosion and Sediment Control Plan dated December 12, 2018
12. Stormwater Operation and Maintenance Plan dated April 2018
13. Stormwater Management Report dated April 2018
14. Operation and Maintenance Program
15. 7.45-Megawatt Solar Installation Development Major LDP and SUP Application prepared by Pimental Consulting, Inc. dated May 14, 2019
16. Letter on behalf of the Richmond Historical Society dated June 4, 2019
17. Plans entitled "Development Plan Review & Special Use Permit Submission, GD Richmond Beaver River I, DC 7.45 MW, AC 5.3 MW, 172 Beaver River Road, Richmond, Rhode Island 02812, Assessor's Plat 8E Lot 12 prepared by Green Development, LLC dated April 18, 2019 and revised May 9, 2018 in 17 sheets

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