



July 14, 2021

Jim Seymour, PE  
Planning Department  
Town of Raymond  
401 Webbs Mills Road  
Raymond, ME 04071

Dear Jim,

We appreciate the time you have spent with us working through the municipal approval process as we seek permits for the Raymond Solar Project (Project). On behalf of BlueWave Solar (BlueWave), we wanted to formally initiate the Site Plan Review process for the proposed Project.

BWC Lake Floria, LLC, an entity wholly owned by BlueWave, is proposing the development of the Raymond Solar Project, a distributed generation solar energy facility. Biodiversity Research Institute, Inc. (BRI) has been engaged as the lead consultant to support the Project.

The Project is a 5.0 megawatt (MW AC) ground mounted utility-scale solar array that will deliver clean renewable energy to the local electrical grid. The Project will contribute to Maine's renewable energy production goals and benefit local energy consumers. The Project is located on Dens Drive off Webbs Mills Road/State Route 85 and includes a portion of the parcels known as Map 9, Lot 4 and Map 10, Lots 87A and 88.

Prior to Project design, a formal wetland and waterbody delineation was performed. This Site was selected due to the accessible upland areas, proximity to local transmission grid, and the willingness of landowners. In addition to this application, the Project is applying for a Maine Department of Transportation (MDOT) Driveway/Entrance permit and a Site Location of Development Act (SLODA) permit from the Maine Department of Environmental Protection (MDEP).

Solar energy projects are very low impact in nature, and solar arrays are not considered impervious surfaces by the MDEP. Additionally, the solar array panel racking system consists of steel piles driven or drilled into the ground to support the mounted panels and will not permanently impact or alter the land. Any disturbed areas are reseeded with a conservation seed mix meadow buffer. The solar panels are surrounded by an agricultural fence that allows for small animals to move freely through the Site. When the useful life of the Project ends, it is decommissioned, and the land is returned to a natural state. The Site would then be suitable for other uses and would not have any permanent impact or alteration from the Project.



We look forward to continuing conversations with the Town of Raymond through the Site Plan Review process. If you have any questions, please do not hesitate to contact me at (207) 631-9134 or by email at [dale.knapp@BRIenvironmental.org](mailto:dale.knapp@BRIenvironmental.org).

Sincerely,

A handwritten signature in black ink, appearing to read "DK", enclosed within a large, sweeping, hand-drawn oval.

Dale F. Knapp, CSS, LSE, CEP, PWS  
Principal  
BRI Environmental  
30 Danforth Street, Suite 213  
Portland, ME 04101

# Town of Raymond Planning Board Application for Subdivision and Site Review

rev 1-25-17

## INSTRUCTIONS

*Please read these instructions carefully. If you are uncertain about a requirement please contact the Town Planner through the Town Offices at 655- 4742 x 161. Failure to submit a complete application as indicated below will delay your application. Deadlines: Complete applications must be submitted by the deadline to be considered for the next meeting. If you are unsure of whether or not an item is required, request a waiver. Ideally you have met with staff and are informed regarding the applicability of items.*

### **Application packets:**

**For projects requiring Planning Board Review** - 15 copies all documents & copies of plans shall be submitted as: 8- Full sized, & 7 reduced plans to fit on 11"x17" plan sheets.

**For projects requiring Staff Review** -5 copies of all documents, and plan copies shall be all full sized. Regardless of review authority all multiple sheet plan sets must be bound. Plan sets of less than 10 pages must be folded accordion style so that the title block is visible on the front of the plan. Plan sets of more than 10 pages may be submitted rolled. Application fees and escrow checks are part of a complete application.

**Applicant:** The applicant must have documentation with owner(s) signature if the owner does not sign the application.

**Owner:** If the owner is a non-person, documentation from the Secretary of the Association or Corporation must be submitted certifying that the person signing has authority to act for the entity.

**Correspondence:** Correspondence will be mailed to one person other than the applicant. Please indicate whether or not the Agent or the Owner will be notified. Condominium Development: All condominium development is subject to both subdivision and site review unless it is a single-family development.

**Project Review:** All projects are required to go to pre-app conference at the Board level. The applicant may opt for a staff review by the Plan Review Committee prior to submittal to the Board. This is highly encouraged for complex development proposals and for applicants that do not hire a professional consultant to represent them or are unfamiliar with the Planning Board regulations and approval process.

**Other Approvals:** A complete copy of any other agency application reviews or approvals must be noted at the time the application is submitted. Town approvals are not granted until all other required agency(s) associated with aspects of the project, but not limited to State, Federal, or other Authority is approved and copies delivered with the Final Plan submittal or application. The Planning Board may issue a condition of approval if it has written evidence that the outside agency has completed the review of an application for the project and is processing the project for approval.

**Fees:** Application fees are non-refundable except in cases where applications are withdrawn within two business days of the deadline. Escrow fees are utilized for plan review including Planner's time in reviewing submissions, drafting materials for the Planning Board, and attending meetings related to the application. Any remaining amount after the review of the plan will be returned to the party which submitted the escrow. If the property is transferred to another party it is important to address the escrow account to assure it is returned to the appropriate party.





# APPLICATION FOR SITE REVIEW ADDENDUM

## Property Information

Parcel: Map 10, Lot 87A,

Deed Reference: Book 10068, Page 022

Parcel Size: 100.717 acres. (82.619 acres north of Map 9, Lot 4; 18.098 acres south of Map 9, Lot 4.)

Parcel: Map 10, Lot 88

Deed Reference: Book 7621, Page 251

Parcel Size: 18.098

Parcel: Map 9, Lot 4

Deed Reference: Book 3053, Page 55

Parcel Size: 90.32 acres

## Owner Information

Parcels: Map 10, Lot 87A and Lot 88

Dennis J. Cole

8 Dens Drive

Raymond, ME

04071

Parcel: Map 9, Lot 4

Central Maine Power CO

C/O Avangrid Management Company

One City Center, 5<sup>th</sup> floor

Portland, ME

04101



# Town Of Raymond Maine

## Submissions Checklist and Requirements for: Major, Minor, and Staff Review Site Plan

BWC Lake Floria, LLC - Raymond Solar Project

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**Applicant and Project Name:**

0 Dens Drive, Raymond, ME

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**Street Address of Proposed Project:**

**INTENT OF SUBMISSIONS CHECKLIST:**

The purpose of this checklist is to provide applicants a reminder checklist of the common elements typically required by Land Use Ordinance, and to assist the Planning Staff or Planning Board. This does not replace the requirements and responsibilities of the applicant to follow the land use ordinance. This is meant to be used as a tool and as guidance to help the applicant with preparing a complete document. Please note that the Planning Staff and or Code Enforcement Officer may determine that any project may be elevated to Planning Board review if determined there are items of the proposed project that promote substantial concerns, public opposition/concern, or could require a waiver of the performance standards.

Please check off appropriate box, fill in spaces provided, or attach separate documents to support the application requirements and checklist items. If the item is not applicable to the proposed project, please label NA or leave the associated box or space blank. Thank You.

**BASIC APPLICATION INFORMATION:**

- Read, fill out required application form, and comply with all the submission requirements of the Site Plan Ordinance. (See Raymond Land Use Ordinance Article 10 - Site Plan Review D. Submissions)
- Name, address, phone # for record owner and applicant
- Names and addresses of all consultants working on the project
- Appropriate application fees and/or review escrow fees included
- Provide necessary copies of application documents, and plans per the level of review authority:
  - Planning Board Review- 15 copies all documents & copies of plans shall be submitted as:
    - 8- Full sized, & 7 reduced plans to fit on 11"x17 plan sheet
  - Staff Review -5 copies of all documents, and plan copies shall be all full sized.

**Type of Proposed Land Use:**

- a. Residential
- b. Commercial
- c. Industrial
- d. Recreational
- e. Other Public Utility and Communications Facility

Is the Project Site part of a Subdivision? Y/N (circle one)

If yes, what size or class of subdivision? Major  Minor  Amended   
If yes, Subdivision name and date of Raymond Planning Board approval, Registry Plan Book/Page  
Date \_\_\_\_\_ Book/Page \_\_\_\_\_

**Site Plan Classification: (Refer to Raymond Land Use Ordinance Article 10 - Site Plan Review B. Authority and classification of Site Plans)**

- Staff Review** (New Building 500 SF to 2,400 SF)  
(Any Exterior renovation that does not exceed 2400 SF)  
(Additional or altered impervious surface that does not exceed 10,000 SF)  
(All Backlot and Backlot Driveways)
- Minor** (New Building that does not exceed 4800 SF)  
(Any Exterior renovation that does not exceed 4800 SF)  
(Additional or altered impervious surface that does not exceed 20,000 SF)
- Major** (New Building that exceeds 4800 SF)  
(Any Exterior renovation that exceeds 4800 SF)  
(Additional or altered impervious surface that exceeds 20,000 SF)

**Amended Plans** (Refer to Land Use Ordinance Article 10, Sect.B.3 for descriptions)

- Di Minimus Revisions
- Staff Review Revisions
- Minor Site Plan Revisions
- Major Site Amendments

**Road Development:** (Refer to Raymond Street Ordinance for Design Standards)

Private  Backlot Driveway  Amended/Road Extension

**Shoreland Zoning:** (Refer to Raymond Shoreland Zoning Provisions)

Yes /  **No** The project falls within the Shoreland Zone (circle one)  
(Please note that Raymond's Shoreland zone setbacks is 600 feet from a great pond/lake exceeding state requirements, see the official Shoreland Zoning Map for official determination)

(if, yes, name of protected Waterbody/Resource, and distance from resource edge)  
\_\_\_\_\_ (lake/pond/stream/river/waterbody resource)

**Conditional Rezoning:** Y/ **No** (circle one) (See Raymond Land Use Ordinance Article 7 - Amendments D. Conditional Rezoning)

(if yes, date of approval, recorded deed/document information) \_\_\_\_\_

**Site Plan Application: Name of Proposed project** Raymond Solar Project

**(Refer to Raymond Land Use Ordinance Article 10 - Site Plan Review D. Submissions)**

Project Narrative: Describe project location, existing conditions of the site and proposed improvements

- Evidence of right, title, or interest in the property: (deed, purchase agreement)
- Proposed use, (Structure size, added net impervious area)
- Land Setback Constraints (Zoning yard setbacks, ZBA approval if required)
- Land Use Restrictions (Easements, Buffers, deeded limitations)
- Opportunities of site (open space, trails, public connectivity, or land preservation)
- Estimate timetable of the project (permit approvals, construction phases and project completion)

**Identify the following requirements as part of the Final Plan:**

**(Refer to Raymond Land Use Ordinance Article 9 – Minimum Standards)**

- Survey Services required:** (Boundary by licensed Maine Surveyor, topography (datum) information w/ 2 ft intervals, metes and bound description, ROW delineation, benchmark elevation)
- Parking Provisions:** (Required parking to floor area use ratio, # proposed, # Required, #handicap accessibility spaces, space dimensions, entrance locations, loading docks, green space/islands)

**(Refer to Raymond Land Use Ordinance Article 9 – Minimum Standards C. Off-Street Parking and D. Off-Street Loading and Article 10 – Site Plan Review, F. Performance Standards: 1-15**

- N/A  **Traffic study:** (trip generation, peak usage, driveway access/entrance permit, local intersection impacts)
- N/A  **Utility service:** (Points of origination, location, above or underground install, Letter of capacity to serve)
- N/A  **Building Design:** (Proposed building footprint plan, side and front elevation views, locations of access)
- N/A  **Site Lighting:** (cut-off light fixture detail, pole height, locations, photometrics/lighting intensity plan)
- N/A  **Septic Design:** (Daily flow, subsurface wastewater layout size, location, test pit logs, HHE-200)
  - Solid Waste Removal:** (Estimated solid waste generated by proposed use, removal process/hauler, dumpster location, recycling efforts, needs for special waste)
  - Groundwater Protection:** (Aquifer protection, well location, hazardous materials contain/storage, SSPP)
  - Stormwater Management:** Refer to Article 10 – Site Plan Review –D. Submission Requirements, 14) (watershed analysis, peak runoff calculations, pipe sizing, runoff quantity and quality)
  - Stormwater Design Requirements:** Refer to Article 9 – Minimum Standards: X Stormwater Quality and Phosphorus Control (phosphorus export treatment calculations or Point System computations)
  - Erosion and Sedimentation Control design** (silt fencing locations, sediment barriers, slope protection geotextile fabric/stone sizing, channel protection)
  - Landscaping** (buffers, plantings, plant species size and locations)
- N/A  **Soils Mapping** (medium/high intensity soils maps, test pit logs, geotechnical reports)
  - Fire prevention** (nearest hydrant identified, sprinkler/suppression requirements, Fire lane/site access, Dept. review sign-off)
  - Signs:** (Proposed site signs, location, height, size, illumination, wayfinding signs, traffic controls)
- N/A  **Design Guidelines for Commercial Zoned Properties:** Recommend to address the Raymond Design Guidelines (A separate document is available online or at the Town Office)
- N/A  Prepared narrative addressing each component of design as outlined in the Guidelines
  - Waiver Requests:** (Any waiver request must be submitted in writing with the application)  
(Only the Planning Board can approve a waiver request!)
  - Other State/Federal Agency permits/review (if required):**

- Federal:** (Army Corp , other)
- State DEP:** (Site Location Application , Stormwater Management , permit by rule ,  
NRPA permit , Wetland Alteration , VRAP or ESA Approval ,  
Other \_\_\_\_\_ (name))
- State:**(MDOT traffic movement permit-TMP , entrance permit )  
(DHS wastewater design approval-engineered system > 2000gal/day )

**Road Development: Refer to Raymond Street Ordinance for Design Standards &  
Refer to Article 10 - Site Plan Review T. Back Lots and Back Lot Driveways**

**Backlot Driveway  Private Road  Public Street**

- Proposed access originates from Dens Drive \_\_\_\_\_ (name of road/street/ lane/way)
- Proposed road/backlot driveway name Faron Woods Drive \_\_\_\_\_ (to be confirmed by e911)
- Proposed length (LF), travel width (LF) Total Impervious area of travel surface(SF)
- Proposed # of lots/units accessing proposed road/backlot driveway
- Road terminus selected: Hammerhead Turnaround  Cul de Sac/terminus circle  Loop
- Draft deed of new access/private road or backlot driveway
- N/A  Current Road frontage: of original lot \_\_\_\_\_ SF proposed lot(s) \_\_\_\_\_ SF
- Closest driveway to proposed access/road/backlot driveway (provide map with distance)
- Proposed private Road ownership (1 owner, shared ownership, Homeowner Assoc., other)
- N/A  Waterbody/Wetland impacts (On-site flagging/mapping, type of resource, crossing/filling location and est. fill volume (CY.), minimization and avoidance)
- Engineering/Professional Design required: (Culvert sizing, stormwater calculations, phosphorus export, treatment computations, erosion and sedimentation control plan)
- Survey Services required: (Boundary, topography information w/2 foot countour intervals, Metes and bound description, ROW Monumentation,

**Road Plan Requirements:**

- Road cross section of materials, ( surface and base materials and depths)
- Plan and profile view of proposed road/access (Stationing, vertical curve/slope data)
- Proposed drainage measures,
- Erosion control measures locations,
- Tree clearing limits
- Road curve data (Pt & Pc stationing, radius, length)
- Proposed utility locations (catch basins, storm drain, water, electrical, gas, cable, etc)
- Zoning space and bulk requirements
- Stormwater phosphorus export treatment calculations or Point System computations
- Is the proposed property and access or private road/backlot driveway part of a previous approved plan? Y/ (circle one)

If Yes, indicate project name, date approved, and recorded deed information

Date \_\_\_\_\_ Book/Page \_\_\_\_\_

**Shoreland Zoning (SZ) : (Refer to Raymond Shoreland Zoning Provisions)**

Proposed Use(s) Public Utility & Communications Facility

N/A **Type of Shoreland Zone(SZ)** LRR1  LRR2  SP  RP

N/A  Existing Lot Size: \_\_\_\_\_SF/AC \_\_\_\_\_% of lot area in SZ

N/A  Existing Impervious Area on Lot= \_\_\_\_\_SF and % of impervious area on exist. Lot= \_\_\_\_%

N/A  Proposed Impervious Area on Lot= \_\_\_\_\_SF and % of total impervious area on exist. Lot= \_\_\_\_%

N/A  Closest horizontal distance of structure development and soil disturbance to waterbody or protected resource = \_\_\_\_\_LF

Mapping of Floodplains: (include FEMA or FIRM maps, indicate 100 -YR flood elevation)

N/A  Label Proposed Structure Footprint Size (SF) and Height (LF)

Is Tree Clearing within 100 feet of waterbody or resource required? (Y/N: (circle one))

Acquisition of state department sign offs: (protected/ endangered species, historical, essential habitats, Aquatic wildlife, wading birds, other.

### Final Site Plan Necessities:

Provide a signature and date block on the final plan for Planning Board or Planning Authority  
Signatures

All Planning Board waivers shall be noted on the final plan prior to signing for the approval

All conditions of approval shall be noted on the final plan prior to the signing of the Planning Board or Planning Authority

Development of requiring Subdivision review, or Road Development Plans, shall provide a recording block and be recorded at the Cumberland County Registry of Deeds within 60 days of the Planning Board signing the approved plan.

The applicant is requested to provide a final pdf electronic version of the final plans upon approval

All Planning Board or Staff approvals are accompanied by a formal Finding of Fact document or letter.

All application fees, escrows, or applicable performance bonds or estimated inspection fee escrow accounts are to be reviewed and approved by the Town, and paid in full. The applicant cannot

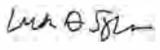
For diligent processing of Final Site Plans the applicant should reply in writing to the Criteria and Site Plan Standards that the Planning Board Shall Consider for determining approval for Site Plan Review. That criteria is located in Article 10 - Site Plan Review, E. Criteria and Standards; a-k.

N/A  For diligent processing of Final Shoreland Zoning Applications the applicant should reply in writing to the required findings that the project meets the criteria as located in the Shoreland Zoning Provisions Section 16: D Procedure for Administering Permits; 1-9.

commence construction until such fees are paid in full

# Agent Authorization

This form hereby authorizes Biodiversity Research Institute, Inc, to act on behalf BlueWave Project Development, LLC (BlueWave Solar) for all permitting matters including any municipal, state, or federal permit filings for solar project development activities in Maine.

By 

Name Mark Sylvia

Title Authorized Signatory

Date Jul 2, 2021

# BlueWave\_BRI Agent Authorization

Final Audit Report

2021-07-02

Created:	2021-07-01
By:	Alan Robertson (arobertson@bluewavesolar.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAyY6Df98JRDBXd9pUNMFhuvhqZFztFOqM

## "BlueWave\_BRI Agent Authorization" History

-  Document created by Alan Robertson (arobertson@bluewavesolar.com)  
2021-07-01 - 7:37:52 PM GMT- IP address: 73.126.33.102
-  Document emailed to Mark Sylvia (msylvia@bluewavesolar.com) for signature  
2021-07-01 - 7:39:17 PM GMT
-  Email viewed by Mark Sylvia (msylvia@bluewavesolar.com)  
2021-07-02 - 2:00:04 PM GMT- IP address: 45.41.142.53
-  Document e-signed by Mark Sylvia (msylvia@bluewavesolar.com)  
Signature Date: 2021-07-02 - 2:00:18 PM GMT - Time Source: server- IP address: 71.233.127.105
-  Agreement completed.  
2021-07-02 - 2:00:18 PM GMT

# State of Maine



## Department of the Secretary of State

*I, the Secretary of State of Maine, certify that according to the provisions of the Constitution and Laws of the State of Maine, the Department of the Secretary of State is the legal custodian of the Great Seal of the State of Maine which is hereunto affixed and of the reports of qualification of foreign limited liability companies in this State and annual reports filed by the same.*

*I further certify that BWC LAKE FLORIA, LLC, a DELAWARE limited liability company, is a duly qualified foreign limited liability company under the laws of the State of Maine and that the application for authority to transact business in this State was filed on February 09, 2021.*

*I further certify that said foreign limited liability company has filed annual reports due to this Department, and that no action is now pending by or on behalf of the State of Maine to forfeit the authority to transact business in this State and that according to the records in the Department of the Secretary of State, said foreign limited liability company is a legally existing limited liability company in good standing under the laws of the State of Maine at the present time.*

*In testimony whereof*, I have caused the Great Seal of the State of Maine to be hereunto affixed. Given under my hand at Augusta, Maine, this eleventh day of June 2021.



*Shenna Bellows*

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**Shenna Bellows**  
*Secretary of State*

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**EXHIBIT A**

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**Narrative**

# EXHIBIT A: NARRATIVE

## Project Summary

BWC Lake Floria, LLC, a subsidiary of BlueWave Solar (BlueWave), is proposing the development and operation of the Raymond Solar Project (Project), a ground mounted solar energy generation facility located in Raymond, Maine. The Project, including all infrastructure such as solar arrays, equipment pads, access roads, and interconnection equipment, will occupy a total of 43 acres.

The goal of the Project is to provide approximately 5.0 megawatts (MW AC) of renewable power to the local electrical grid that will contribute to Maine's renewable energy production goals and will benefit local energy consumers.

In addition to this Site Plan Review application, a Maine Department of Transportation (MDOT) Driveway/Entrance permit, and a Maine Department of Environmental Protection (MDEP) Site Location of Development Act permit (Site Law). The Project team anticipates filing the MDOT Driveway/Entrance permit application in late July 2021 and the MDEP Site Law permit in August/September 2021.

## Project Location and Existing Conditions

The proposed Project is comprised of a 43-acre area located off Webbs Mills Road / State Route 85 (Site). The Site includes portions of three parcels; Map 9, Lot 4 and Map 10, Lots 87A and 88. The Site will be accessed from a proposed private road off Dens Drive (Dens Drive is an existing Private Road) and will transition to a gravel access road that will continue into the Site area. See **Exhibit C: Site Plan**.

The Site is dominated by upland forest with a small portion of existing open field in the southwest portion of the Site. Several wetlands and one stream are present on the Site. A Central Maine Power Company (CMP) transmission line runs east to west through the southern portion of the Site. The surrounding area is largely forested with residential and agricultural developments. For more information regarding the natural resources on the Site, see **Exhibit G: Natural Resources**.

## Proposed Site Conditions

As proposed, the Project will have 49,445 square feet of total impervious area, including equipment pads, access roads, and racking posts. Solar panels are not considered impervious by MDEP and disturbed areas of the Site will be seeded with a conservation seed mix. The Project does not propose any buildings. As the solar array will be inaccessible to the public and built on private land, the Project presents few opportunities for public trail access or open space.

However, the Project will allow for continued use of the snowmobile trail that runs within the CMP transmission corridor by providing a ramped crossing and culvert over the Project access road.

## Title, Right, or Interest

BWC Lake Floria, LLC has provided an option to lease the land sufficient for the Project on both Project parcels owned by Dennis Cole (Map 10, Lot 87A and 88). The corresponding Option Agreement is included as **Exhibit B: Title, Right, or Interest**. The Project is also located on the CMP transmission corridor parcel (Map 9, Lot 4), and BlueWave is in the process of finalizing an Access Road Easement with CMP to construct the access road across this parcel. BlueWave estimates that this Access Road Easement will be finalized by mid-August, 2021 and it will be shared with the Planning Board as soon as it is received. This is the only land use restriction for the Project. There are no land setback constraints as all Project parcels are located in the rural-residential zone. An abutters list is provided as **Exhibit E: Abutters List**.

## Project Maps

The following Maps are included in **Exhibit D**:

- Project Location Map, Aerial
- Project Location Map, USGS Topographic Map
- Zoning Map
- Tax Map
- Boundary Survey
- FEMA 100-Year Flood Map
- Maine Geological Survey Significant Sand and Gravel Aquifers Map
- Natural Resources Map
- Significant Wildlife Habitat Map
- Snowmobile Trail Map

## Decommissioning Plan

BWC Lake Floria, LLC will be responsible for decommissioning the Project within six months of the end of its useful life or expiration/termination of the lease agreement. Please see **Exhibit I: Decommissioning Plan** for a detailed decommissioning plan for the Project. The Maine Department of Environmental Protection is requiring the Project to provide a form of surety (eg. Bond, Letter of Credit) to cover the costs of decommissioning, and a copy of this surety will be provided to the Town of Raymond prior to issuance of the building permit.

## Performance Guarantee

The Project will comply with the performance guarantee listed in Article 10 of the Town of Raymond Land Use Ordinance. After an amount is set by the Town Manager, the Project will post

a performance guarantee in the form of a certified check, performance bond, or irrevocable letter of credit. Please see **Exhibit L: Performance Guarantee Statement** for the notarized Performance Guarantee Statement.

## Private Road - Faron Woods Drive

The Project is proposing the construction of Faron Woods Drive, a private road that extends off the existing private road, Dens Drive. Faron Woods Drive will be 18 feet wide, approximately 597 feet long with a total impervious area of travel surface of 12,060 square feet. The private road will contain one hammerhead turnaround located before the proposed bar gate. The total road frontage of the private road is 597 feet long. During operation, unauthorized vehicles will not have access to the Site and traffic will be minimal; a technician may visit the site for routine maintenance 2-4 times per year. Faron Woods Drive will be owned by Dennis and Patricia Cole, the current landowners of Map 10, Lots 87A and 88.

The road will be constructed with 12-inch aggregate sub-base and 3-inch crushed aggregate base on top. The proposed access road will be constructed at grade and water will shed to one side of the road at a 2% slope, with the maximum grade not exceeding 10%. After construction is complete there will be a comprehensive cleanup of the entire road right-of-way. See the Waste and Hazardous Materials section below for more details regarding the cleanup of the road and the entire Project. The proposed road does not require any sidewalks and completely avoids direct impact to wetlands and waterbodies.

Faron Woods Drive and the proposed access road that continues north of the first bar gate will be superelevated to direct runoff to roadside buffers. Ditch turnout buffers are proposed in areas where the runoff will concentrate along the edge of the road. The ditch turnout buffers were designed in accordance with the Maine Stormwater Best Management Practices Manual, Volume III, Chapter 5 – Vegetated Buffers, Section 5.3 – Buffer Adjacent to Downhill Side of a Road. The locations of the buffers are illustrated on the Site Plan. See **Exhibit H: Stormwater Management and Erosion Control** for more details.

## Preliminary Construction Schedule

Contingent upon issuance of all required permits, Project construction is anticipated to begin in July 2022 and reach completion in January 2023. **Exhibit K: Construction Schedule** includes a preliminary construction schedule illustrating this timeline. Project infrastructure to be constructed will include gravel access roads, concrete inverter and switchgear pads, solar modules/racking, a step-up transformer and overhead power poles. The Project will interconnect to the overhead utility lines along Webbs Mills Road / State Route 85. Solar arrays will not require ballasted foundations and will instead rely on ground screws or pile-driven posts to mount solar panel racking; sub-grade concrete foundations will not be required. This installation method minimizes native soil disturbance, which in turn lowers any potential risk for erosion and sedimentation during or after construction. Construction will employ all applicable erosion and

sediment control Best Management Practices from commencement of work through to completion of the Project.

## Preservation of Landscape and Buffers

The Project solar array was strategically sited so it would not closely abut the adjacent land parcels. Natural features will be maintained between the proposed development and abutting properties. No clearing will take place along the boundary of the Project Parcels. A perennial conservation seed mix will be used across the Site to grow a meadow under and around the solar array. In addition, the Project will install an 7ft tall agricultural-style wooden post fence to allow for the movement of small wildlife in and out of the Project area.

The proposed Project has been designed with the surrounding scenic character in mind. A visual assessment of the Site and the surrounding three miles was conducted by T.J. Boyle Associates and is included as **Exhibit J: Visual Assessment Summary**. The summary concluded that the Project will not have an unreasonable adverse effect on the scenic character of the surrounding area. The memo includes the a viewshed analysis map and photographs from the study area.

## Vehicular Access, Parking, and Entrance to the Site

To prevent unauthorized vehicles from accessing the Site, the Project will be secured by two bar gates along the proposed private road/access road. The first bar gate is proposed at the terminus of Faron Woods Drive and second is proposed at the junction of the access road and 7-foot-tall fence surrounding the solar array. Maintenance personnel may visit the Site several times per year to perform routine maintenance and will be able to park at the hammerhead turnaround located adjacent to the bar gate at the fence line. This turnaround will be wider than the other two turnarounds to accommodate for two parking spaces. As the public will be restricted from entering the Site, public parking will not be necessary. In addition, the Project does not require and is not proposing any sidewalks or curbing.

## Stormwater Management and Erosion Control

A Stormwater Management Report and an Erosion and Sedimentation Control Inspection and Maintenance Plan were prepared by registered professional engineers at Berry, Huff, McDonald, Milligan, Inc. (BH2M). The Stormwater Management Report has been prepared to satisfy the requirements for the Maine Department of Environmental Protections “Stormwater Management Rules” Chapters 500, 501, and 502 as well as the most recent version of the “Maine Stormwater Best Management Practices Manual”.

The Stormwater Management Report was designed so that post development stormwater runoff will not exceed the pre-development stormwater runoff for the 24-hour duration, 2-,10-,25-year frequency storm events. Vegetated meadow conditions will be beneath the solar arrays to

provide treatment of stormwater produced by the panel posts, racks, and the equipment pads. Slopes within the solar arrays are on average less than 8%, and all less than 15%. Solar array meadow areas will not be mowed more than twice per year as required by MDEP and will remain vegetated. Roadside vegetated buffers will be implemented for the treatment of the proposed gravel access roads. Access roads will be designed to include runoff conveyance ditches that will protect road surfaces and will transport stormwater to established meadow buffers for treatment. The Project does not meet the conditions for application of the Phosphorus Standard, as the standard does not apply to the Project. See section 1.7 of the Stormwater Management Report provided in **Exhibit H: Stormwater Management and Erosion Control**, for more details explaining this rationale. Along with the Phosphorus Standard, the Stormwater Management Report also addresses the Basic, General, Urban Impaired Stream, and Flooding standards outlined in the MDEP Stormwater Management rules.

The Erosion and Sedimentation Control Inspection and Maintenance Plan is provided in **Exhibit H: Stormwater Management and Erosion Control** and identifies temporary and long-term Best Management Practices for both temporary construction-phase activity and long-term post-construction operation.

## Soils

Soil map units at the Site were identified through the Natural Resources Conservation Service (NRCS) Web Soil Survey for Cumberland County and Part of Oxford County, Maine, Version 17, June 5, 2020.

The Site is mapped with level to moderately steep slopes, with soils ranging from well drained to moderately well drained. Most of the Site is dominated by Paxton fine sandy loam (3 to 8 percent slope). This soil type is comprised of 87 percent Paxton soils and 13 percent minor soil components. Paxton is a fine sandy loam that has a moderately shallow restrictive layer at 18 to 40 inches. It is well drained with a low seasonal water table at 30 to 42 inches and is formed by coarse-loamy lodgement till derived from mica schist. The unit is not hydric. Bedrock is expected between 16 and 40 inches from the soil surface throughout the Site. For more details refer to the full Soils Report, see Appendix A, of the Stormwater Management Report (**Exhibit H: Stormwater Management and Erosion Control**).

The soils present on the Site are generally all suitable for the proposed use, given the lack of ground disturbance proposed. Properly installed and maintained Best Management Practices and Erosion Control Measures will address any necessary soil stabilization and restoration efforts.

## Utilities

The Project will not require the construction or use of telecommunication lines, wastewater disposal systems, or water supply infrastructure. The electrical lines required by the Project to

interconnect with the electrical grid are identified on the Site Plan. Along Dens Drive, Faron Woods Drive, and the proposed access road, the Project proposes the installation of approximately thirteen (13) aboveground utility poles associated with the electrical lines. To comply with CMP's requirements, the electrical lines are proposed to transition to a buried underground line extending north of the junction of the access road and the CMP transmission corridor. In an effort to limit ground disturbance and additional construction activities along the roads, the Project is requesting a waiver of the requirement to install utility lines underground.

## Water Supply

Operation of the Project will not require any water supply or subsurface wastewater disposal. During construction of the Project, non-potable water will be used for dust control on access roads. The water will be drawn from an offsite non-potable source and spread on-Site by tanker trucks. Any wash water produced during construction will be released on concrete pads and gravel surfaces.

## Sewage Disposal

Operation of the Project will not require any sewage disposal. During construction, temporary toilet facilities will be provided for construction personnel working on-Site. A Maine-licensed wastewater service provider will transport and maintain the temporary toilet facilities.

## Fire Protection and Emergency Vehicle Access

The Project proposes to place a Knox Box at both Project bar gates to allow for emergency personnel access. There are three hammerhead turnarounds and two 30-foot-wide passing areas proposed along on Faron Woods Drive and the access road. These were designed to allow for fire trucks or other emergency vehicles to turn around or pass one another during the event of an emergency. Faron Woods Drive and the access road will be engineered and constructed with road base materials that are adequate to support the weight class of emergency vehicles. The closest fire hydrant to the Site is located at the entrance to Raymond Elementary School, approximately 1,320 feet southeast of the entrance to Dens Drive.

## Waste and Hazardous Materials

Solid waste generation will be limited to the construction phase of the Project only. Waste generated will primarily derive from tree clearing, construction, and the installation of the Project equipment. In addition, the Project is expected to produce solid waste from the packing materials associated with the shipment of Project equipment such as solar panels, racking, conductors, inverters, and transformers and well as miscellaneous waste material.

Solid waste generated during clearing and construction of the Project will be hauled and disposed of by a Category A, state-licensed transporter. After tree clearing, all remaining stumps will either

be left in place or ground on-site and used to make erosion control mulch. All stumps that are not able to be chipped on-site will be hauled off-site and disposed of at a nearby transfer station.

The Project does not propose to use any hazardous materials during the construction phase or normal operation of the Project. The electrical transformers on the Site will contain 550 gallons of Envirotemp™ FR3™, non-toxic, biodegradable, vegetable transformer oil, thus not triggering the need for containment under the transformers. No energy storage systems are proposed.

## Odors

Construction of the Project may result in minor gasoline and or diesel exhaust fumes from construction vehicles on-Site. Normal operation of the Project will create no odors.

## Noise

During operation of the Project, there will be some sound generated, mostly from electrical equipment such as transformers. However, noise levels are expected to be minimal and should have no adverse impact on nearby properties. According to the NEMA TR1 Standard for a 2500 kVA transformer, the typical sound level emitted by the proposed transformer is 63 dBA at 10 meters (32.81 feet). Per the proposed Site plan (**Exhibit C: Site Plan**), the two 2500 kVA transformers will be installed at least 894 feet from the closest property line. Therefore, the Project should not create an adverse noise impact on surrounding properties.

## Vibrations

Construction Best Management Practices will be implemented to control any vibrations that occur during construction. The normal operation of the Project is expected to have minimal vibrations.

## Exterior Lighting

No exterior lighting is proposed for the Project.

## Signs

A placard will be installed on both of the Project bar gates and it will list emergency contact information. The placard will not be illuminated and is the only sign the Project proposes to install.

## Snowmobile Trail

A snowmobile trail maintained by the Raymond Rattlers Snowmobile Club follows the CMP transmission line corridor in Map 9, Lot 4. The Project team contacted Larry Wood with the

Raymond Rattlers about the proposed Project. Mr. Wood asked that the access road be designed so that snowmobiles could cross the access road at a perpendicular angle without running into a swale or ditch next to the proposed access road. The Project team has accommodated this request by proposing a buried culvert within the proposed swale on the eastern side of the access road so that a snowmobile can ride over the swale and still allow the passage of any stormwater parallel to the road. The edges of the road at this crossing will be graded and ramped in such a way to accommodate the ongoing use of the trail. See **Exhibit D: Maps** for a map depicting the nearby snowmobile trail.

## Agency Consultation

The Maine Natural Areas Program (MNAP) was contacted on October 9, 2020 to review the Site of the proposed Project for any Rare, Threatened, and Endangered (RTE) botanical species and any other unique natural communities or features. **Exhibit F: Agency Consultation** includes MNAP's response received October 19, 2020. MNAP's review of the Site involved examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts. The official response covers only botanical features. According to the review, there are no rare botanical features documented specifically within the Site.

The Maine Historic Preservation Commission (MHPC) was contacted in February 2021 for consultation on the Project. In the March 8, 2021 response letter, the MHPC requested additional information including "a site plan and photographs of any buildings, 50 years or older, located on or adjacent to the proposed project". This response letter is included in **Exhibit F: Agency Consultation**. On June 4, 2021, the Project team sent the MHPC a report that included the additional information they had requested. On June 16, 2021, a response from MHPC was received, stating that there are no National Register eligible properties on or adjacent to the parcels, and the Project area is not considered sensitive for archaeological resources. The report and response letter are included in **Exhibit F: Agency Consultation**.

On February 22, 2021, an inquiry was sent to the Maine Department of Inland Fisheries and Wildlife (MDIFW) regarding the presence of any protected species or habitats on-Site. MDIFW's response to the inquiry was received March 5, 2021, is included in **Exhibit F: Agency Consultation**, and is discussed in detail in **Exhibit G: Natural Resources**.

## Waiver Requests

The Project team requests the following waivers from the Planning Board:

- The Town Land Use Ordinance requires mapping of single trees with diameter of ten (10) inches measured three (3) feet from the base of the trunk. Due to the size of the Project, and the limit of disturbance being mostly forested, it would be unfeasible to measure the diameter of every tree located within the 43-acre Project area.
- The Town Land Use Ordinance requires the installation of utility lines to be underground. To limit ground disturbance and additional construction activities along the roads, the Project is requesting a waiver to allow for the installation of aboveground electrical lines on overhead utility poles from the southern end of Dens Drive to the junction of the access road and CMP transmission corridor. This request is also driven by the interconnection design provided by CMP which places protective equipment on poles along Dens Drive.
- The Town Land Use Ordinance requires the plans to show the location of the water mains, sewer mains, wells, fire hydrants, culverts, drains, pipe sizes, grades, and direction of flow, existing within two hundred (200) feet of the subject property. Since the Project will not require connection to municipal water, sewer, or stormwater drainage systems, the Project requests a waiver for this requirement.

**EXHIBIT B**

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**Title, Right, or Interest**

# BLUEWAVE

## OPTION AGREEMENT

THIS OPTION AGREEMENT (“Option”) is entered into September 9<sup>th</sup>, 2020 (the “Effective Date”) by **Dennis J Cole, an Individual**, of **8 Den's Drive, Raymond, ME, 04071** hereinafter referred to as the “Owner,” and **BWC Lake Floria, LLC**, a Delaware limited liability company with an address of PO Box 171381, Boston, MA 02117, hereinafter referred to as “BlueWave.” Owner and BlueWave are at times collectively referred to hereinafter as the “Parties” or individually as the “Party”.

### WITNESSETH:

WHEREAS, Owner is the owner of certain real estate located at the site addresses listed in column “1. Site Address” of Table 1 below, referred to on the **Raymond Assessor’s Database** as the parcel ID’s listed in column “2. Parcel ID” of Table 1 below, and being further described in the **Cumberland County Registry of Deeds** as the deed book and page numbers listed in column “3. Deed Book and Page” of Table 1 below, comprising a total of approximately **106.23 acres** of land and improvements (the “Property” as shown in Exhibit A)

1. Site Address	2.Parcel ID	3. Deed Book and Page	4. Parcel Size
Damon Road, Raymond, Maine, 04071	0010-0087-A	Book 10069, Page 22	101.0 Acres
8 Den’s Drive, Raymond, Maine, 04071	0010-0088	Book 7621, Page 251	5.23 Acres

; and

WHEREAS, BlueWave is investigating the development of a portion of the Property comprised of approximately **30.0** acres of land and improvements (the “Project Site”) for electricity generation (the “Project”); and

WHEREAS, BlueWave desires to obtain from the Owner an option to lease the Project Site, the location and size as generally depicted on Exhibit B; and

WHEREAS, the parties wish to reduce the terms and conditions of their agreement to writing.

NOW THEREFORE, in consideration of the promises set forth herein and other good and

# BLUEWAVE

valuable consideration and the mutual benefits accruing to each party, the receipt and value of which is hereby acknowledged, the parties hereby covenant and agree as follows:

1. In consideration of the sum of [REDACTED] (the “First Option Deposit”) previously paid by BlueWave to Owner upon entering into the Option previously signed by BlueWave and Dennis J Cole on September 9<sup>th</sup>, 2020, Owner hereby grants to BlueWave a period until September 9<sup>th</sup>, 2021 (“First Option Period”), in connection with the Project and subject to the terms and conditions contained herein, the exclusive right to explore the development of any portion of the Property for electricity generation and to lease the Project Site, for the purpose of installation, maintenance and operation of a solar energy electric generating facility (“Facility”) comprised of solar panels, utility wires, poles, cables, conduits and pipes, and related ground mounted equipment subject to terms and conditions of a Land Lease Agreement, the terms and conditions of which shall include, but shall not be limited to, the matters set forth in Paragraph 9 below.
2. Prior to the expiration of the First Option Period BlueWave may extend the Option for an additional three hundred sixty-five (365) days (the “Second Option Period”) upon written notice to Owner and payment by BlueWave of an additional, nonrefundable deposit of [REDACTED] (“Second Option Deposit”). Prior to the expiration of the Second Option Period BlueWave may extend the Option for an additional three hundred sixty-five (365) days (the “Third Option Period”) upon written notice to Owner and payment by BlueWave of an additional, nonrefundable deposit of [REDACTED] (“Third Option Deposit”). Together, the First Option Deposit, Second Option Deposit, and Third Option Deposit are referred to herein as “Deposits”. Together, the First Option Period, Second Option Period, and Third Option Period are called “Option Periods”. BlueWave shall have the right to terminate the Option, as to all or any part of the Property, at any time and for any reason, with immediate effect during the Second, and Third Option Periods.

# BLUEWAVE

3. The Option may be further extended beyond the Option Periods by mutual agreement in writing. Should BlueWave fail to exercise the Option during the Option Periods or any extension thereof, except for matters that specifically survive, all rights and privileges granted hereunder shall be deemed completely surrendered, this Option terminated, and no additional money shall be payable by either Party to the other. The Deposits shall be deemed refundable at any point during the Option Periods in the event that BlueWave relies on a specific representation by Owner that is negligently or deliberately misleading.
4. If applicable, during the Option Period(s), Owner, at BlueWave's sole expense, agrees to undertake the necessary steps for the release of the Premises from the provisions of 36 M.R.S.A. § 571-584-A (Tree Growth) or 36 M.R.S.A. § 1101-1121 (Farm and Open Space), including service of the request to the Town of **Raymond** of the withdrawal the Premises from Tree Growth or Farm and Open Space classifications as provided for in §§ 581 or 1110. BlueWave shall be responsible to pay for all withdraw penalties and any other fees and taxes assessed to effectuate the release of the Premises from the provisions of §§ 571-584-A, or 1101-1121. If the Premises is burdened by restrictive covenants or easement in the name of a third party, Owner, at BlueWave's sole expense, agrees to undertake the necessary steps for the release of the Premises from the restrictive covenants or easement.
5. During the Option Period(s) and subject to the terms of the Option, BlueWave has the right to make all necessary governmental and utility company filings, survey, identify and flag wetlands, undertake geotechnical and environmental studies and investigations, and design the Facility at the Project Site. BlueWave agrees to keep Owner reasonably informed of all material events and activities associated with BlueWave's efforts, including the efforts necessary to secure all permits, negotiate agreements with third parties to purchase the output of the generating facility, file an interconnection application, survey, design, undertake subsurface geotechnical and environmental testing,

# BLUEWAVE

financing activities and otherwise to advance the approvals necessary to proceed with the development, all at no monetary cost to Owner (“Due Diligence”). Owner shall provide BlueWave or its agents with information about the Property and in all other ways cooperate to the extent commercially reasonable in BlueWave’s Due Diligence activities at no monetary cost to Owner, including the provision of access to the Property to BlueWave or its agents with twenty-four (24) hour advance notice. BlueWave agrees not to submit any applications or plans to any authority having jurisdiction over land-use and/or the issuance of permits without first obtaining the approval of same by Owner, which approval Owner agrees not to unreasonably withhold or delay. The final size and configuration of the Project Site, including access and utility easements, shall be approved in advance by Owner in its reasonable discretion.

6. If BlueWave does not exercise its Option as herein provided, it will immediately return all disturbed areas of the Property and Project Site to their former condition. This provision shall survive expiration or termination of this Option.
7. All notices required or permitted to be given under this Option shall be given in writing to the addresses above, by certified mail, return receipt requested or by overnight mail via a qualified commercial courier. Notice is effective on the date posted.
8. The parties acknowledge this agreement grants BlueWave an irrevocable and exclusive option to lease the Property. In the event BlueWave exercises its option to lease the Property as above provided, the Owner shall be required to enter into a Lease Agreement, the terms and conditions of which shall include, but shall not be limited to, the matters set forth in Paragraph 9 below. Notwithstanding any condition to the contrary that may be contained in this Agreement, no clause shall be interpreted or deemed to be interpreted so as to render the Option conditional. For the avoidance of doubt, this Option shall be deemed for all intents and purposes to be unconditional and irrevocable and the parties shall proceed in good faith to enter into a mutually agreeable Land Lease Agreement no

# BLUEWAVE

later than three (3) years from the Effective Date of this Option, failing which, except for matters that specifically survive, all rights and privileges granted and obligations required under this Option shall be deemed completely surrendered and each party releases the other from any and all further obligations hereunder.

9. The Land Lease Agreement shall contain mutually satisfactory terms and conditions which shall include, but not be limited to the following:
  - a. Initial term shall be for twenty (20) years (“Initial Term”) commencing on the date of Commercial Operation as defined below. Prior to the end of the Initial Term, BlueWave shall have the right, in its sole discretion, to elect to extend the Initial Term for up to four (4) five (5) year extensions (each such extension referred to as a “Renewal Terms”). BlueWave shall provide Owner written notice of its election to exercise the Renewal Term option on or before the commencement of the final year of the Initial Term, or the end of the then-current Renewal Term, whichever is later.
  - b. Commencing upon the earlier of the date that BlueWave commences construction of the Project or installation of any component of the Facility (“Construction Phase”) or the third (3rd) anniversary of the date that the Land Lease Agreement is fully executed, rent is payable to Owner, in advance, in equal installments at the beginning of each calendar month , at the annualized rate of [REDACTED] per megawatt (DC) of power planned and permitted to be installed, which rent shall continue until the date the Facility has been interconnected to the utility electric grid and commercial sale of energy on a commercial basis has commenced (“Commercial Operation”).
  - c. Commencing on the date that is the earlier of the date of commencement of Commercial Operation or one (1) year from the date of commencement of the Construction Phase, the rent is payable to Owner in advance, in four (4) equal installments at the beginning of each calendar quarter. The rent is payable at the annualized rate of [REDACTED] per megawatt (DC) of the Facility (“Installed

# BLUEWAVE

Power”), which rent escalates annually throughout the Initial Term, and any extension term, on the anniversary date of the date of Commercial Operation by [REDACTED] over the amount of the rent due in the immediately preceding year.

Notwithstanding the foregoing, regardless of the rent rate calculated using the annualized rate of [REDACTED] per megawatt (DC) inclusive of any rent escalation, rent shall not be less than [REDACTED] per year.

- d. The parties agree to execute a Commencement Agreement to memorialize the commencement dates of the Construction Phase and Commercial Operation.
- e. The parties recognize that one Megawatt of installed capacity will require approximately three to five acres of useable land on the Property. The parties recognize they have a common interest in maximizing the amount of solar installed on the property and will work cooperatively over the period of this Option to make an informed estimate of the potential commercially viable installed capacity acceptable to Owner and BlueWave. The Property is expected to accommodate between **3.00** and **8.00** MW (DC). The final size of the project shall be subject to certain criteria, including the available capacity on the local feeder, local and regional land-use regulations, engineering considerations related to the site and project design, state regulations pertaining to the sizing and registration of renewable energy projects, and the availability of financing at acceptable terms, and in all instances BlueWave will make every effort to maximize the amount of installed capacity on the Property.
- f. Any payment due under this agreement shall be timely if it is made on the due date, with thirty days grace.
- g. BlueWave shall have the responsibility to pay any personal property tax, assessments, or charges owed on the Project Site which result from the installation, maintenance, and operation of the solar photovoltaic system. Owner shall remain responsible for paying any underlying real estate tax.
- h. BlueWave shall post a decommissioning surety with the Authority Having Jurisdiction as part of the regular permitting process.

# BLUEWAVE

10. BlueWave shall require all contractors to maintain commercial general liability insurance and statutory workers' compensation insurance. All construction, alterations and other work performed by BlueWave, its agents and subcontractors at the Project Site and Property are to be performed in a workmanlike manner and done so that no liens for the benefit of contractors, materials providers or trades providing labor or materials to the project are filed against the Project Site or Property.
11. The monetary terms of this Option will be held in strict confidence by the Owner and not shared with any third parties including other developers, investors or brokers unless Owner receives authorization from BlueWave.
12. This Option shall be binding upon the parties hereto and the respective heirs, successors and assigns of each. Without limiting the foregoing, this agreement may be assigned with notice, but without approval or consent of Owner, to BlueWave's affiliates, subsidiaries, and to any entity which is providing financing to BlueWave in connection with the Property.
13. Owner owns fee simple title to the Land and has good, merchantable and insurable title to the Property, free and clear of all liens, encumbrances, claims, options, leases, rights of first refusals, or judgements, except in so far as any of the latter items have been submitted and assented to by BlueWave.
14. Owner has provided BlueWave with any and all information pertaining to any outstanding or discharged mortgages on the Property.
15. During the Option Period(s) Owners shall promptly notify BlueWave of any and all notices from the Town of **Raymond** or municipal treasurer delivered to the Owner pursuant to 36 M.R.S. § 941, 942, or 943 of unpaid tax assessments against the Property. A copy of said notice shall be provided to BlueWave. Owners shall promptly notify

# BLUEWAVE

BlueWave if they receive notice of, or become aware of, any and all tax lien certificates claimed against the Property and recorded in the **Cumberland County Registry of Deeds** pursuant to 36 M.R.S. § 942. A Copy of said tax lien certificate shall be provided to BlueWave. Owners shall promptly notify BlueWave of any and all Notice of Impending Automatic Foreclosure received from the Town of **Raymond** or municipal treasurer pursuant to 36 M.R.S. § 943. A Copy of said Notice of Impending Automatic Foreclosure shall be provided to BlueWave.

16. The person executing this Option on behalf of the Owner has the full power and authority to bind Owner to the obligations of Owner set forth herein. The entry into and performance of Owner's obligations under this Option will not violate or result in a breach of any contract, agreement or any law, administrative regulation, or court decree by which Owner or the Property is bound. If Owner is not a natural person, Owner is duly formed and validly existing entity and is qualified to do business in and in good standing under the laws of the State of Maine.
17. Notwithstanding anything appearing to the contrary in this Agreement, no direct or indirect partner, member or shareholder of either party (or any manager, director, officer, principal, trustee, employee or agent of any such direct or indirect partner, member or shareholder), disclosed or undisclosed, shall be personally liable for any debts, liabilities or obligations of the party, or for any claims against the party, arising out of or resulting from this Agreement. Any such debts, obligations, liabilities or claims shall be satisfied solely out of the assets of the obligated party. In no event shall any personal judgment be sought or obtained against any partner, member, manager, shareholder, director, officer, principal, employee, agent, or owner of either party, direct or indirect, disclosed or undisclosed.
18. BlueWave agrees that parcel **0010-0088** located at **8 Den's Drive, Raymond, ME 04071** can only be utilized for the purposes of access, utility, and construction easements that will be negotiated in conjunction with the Land Lease Agreement.

# BLUEWAVE

19. BlueWave agrees that the portion of parcel **0010-0087-A** located at **Damon Road, Raymond, ME 04071** south of parcel **009-004**, can only be utilized for the purposes of access, utility, and construction easements that will be negotiated in conjunction with the Land Lease Agreement.
  
20. BlueWave and Owner agree that upon signing of this agreement, BlueWave will be terminating the previous Option signed between BlueWave and Dennis J Cole with an execution date of September 9<sup>th</sup>, 2020. This agreement will take the place of the previous Option between BlueWave and Dennis J Cole for all intents and purposes. BlueWave and Owner acknowledge that payment of the First Option Deposit under the previous Option signed between BlueWave and Dennis J Cole, with an execution date of September 9<sup>th</sup> 2020, has been made in place of the First Option Deposit on this Option Agreement.

# BLUEWAVE

Executed as an instrument under seal on April 23, 2021.

Dennis J Cole

By: 

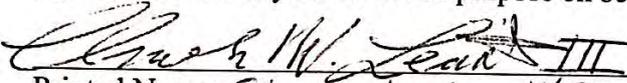
Name: Dennis J. Cole

Title: Owner

STATE OF MAINE

COUNTY OF Cumberland, ss.

On this 23<sup>rd</sup> day of April, ~~2020~~ <sup>2021 cwl</sup>, before me, the undersigned notary public, personally appeared Dennis J. Cole, proved to me through satisfactory evidence of identification, which was ME Drivers Lic. # 8772054, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that s/he signed it voluntarily for its stated purpose on behalf of owner (himself).



Printed Name: Charles W. Leavitt III

My Commission Expires: 10-12-2027

# BLUEWAVE

Executed as an instrument under seal on 7/9, 2021.

BWC Lake Floria, LLC

By: BlueWave Project Development, LLC  
Its: Sole Member

By: BWC Holdings, LLC  
Its: Sole Member

By: \_\_\_\_\_

Name: Eric S Graker - 6/22

Title: Authorized Signatory

COMMONWEALTH OF MASSACHUSETTS  
COUNTY OF Norfolk, ss.

On this 9 day of July, 2020, before me, the undersigned notary public, personally appeared Eric S Graker, proved to me through satisfactory evidence of identification, which was Massachusetts Driver's License, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that s/he signed it voluntarily for its stated purpose on behalf of BWC Lake Floria, LLC

[Signature]  
Printed Name: Michael Yuan  
My Commission Expires: 2/12/2027



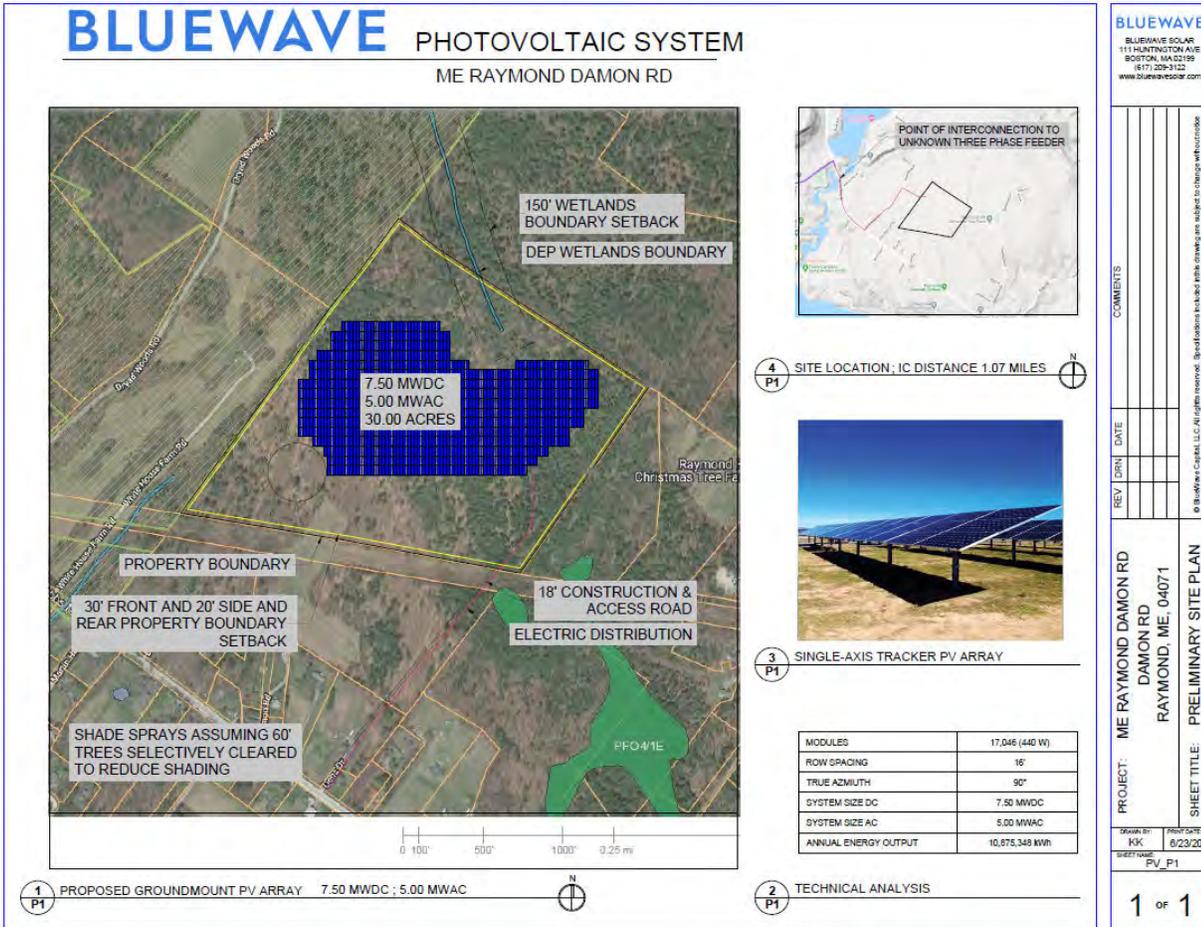
# BLUEWAVE

EXHIBIT A: The Property



# BLUEWAVE

Exhibit B: The Project Site  
(note: exact usable acreage of the Project Site is to be determined)

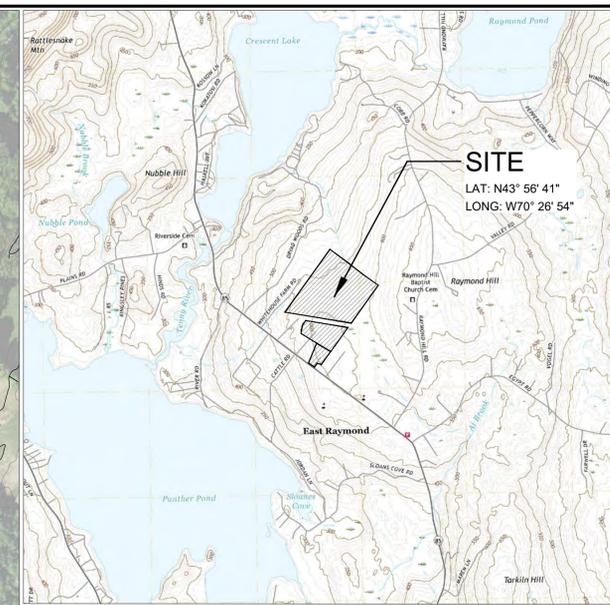
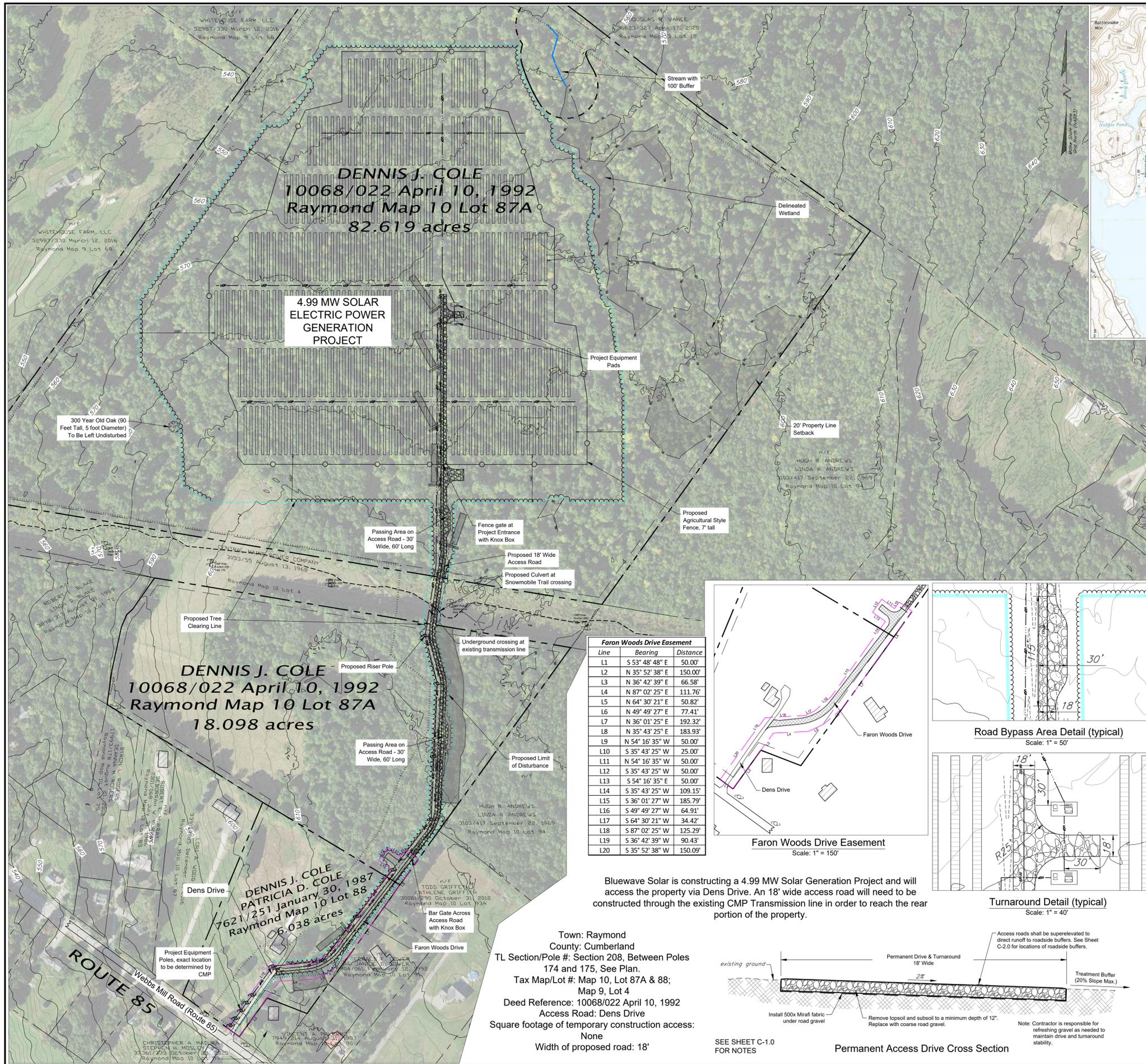


# BLUEWAVE

**EXHIBIT C**

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**Site Plan**



LOCATION MAP  
SCALE: 1" = 1/2 Mile

- LEGEND**
- EXISTING POWER POLE / PROPOSED POLE
  - APPROXIMATE PROPERTY LINES
  - APPROXIMATE PROJECT PARCEL
  - SETBACKS TO SOLAR PANEL RACKING
  - EXISTING GRADE CONTOUR LINES (2 FOOT INTERVALS)
  - PROPOSED GRADE CONTOUR LINES (10 FOOT INTERVALS)
  - PROPOSED GRADE CONTOUR LINES (2 FOOT INTERVALS)
  - EXISTING TREELINE
  - EXISTING OVERHEAD POWER
  - PROPOSED PROJECT FENCE
  - PROPOSED UNDERGROUND POWER
  - PROPOSED OVERHEAD POWER
  - PROPOSED SWITCH GEAR PAD & TRANSFORMER PAD
  - PROPOSED FIXED MOUNT SOLAR PANEL RACKING
  - DELINEATED WETLAND
  - PROPOSED 18' GRAVEL ACCESS DRIVE
  - PROPOSED 18' PRIVATE ROAD
  - DELINEATED STREAM
  - ENVIRONMENTAL BUFFER
  - PROPOSED TREELINE
  - PROPOSED LIMIT OF DISTURBANCE
  - ENVIRONMENTAL SURVEY BOUNDARY
  - PROPOSED STORMWATER TREATMENT BUFFER
  - EXISTING STRUCTURES
  - 300 YEAR OLD OAK TREE (90 FEET TALL, 5 FOOT DIAMETER)
  - EXISTING SNOWMOBILE TRAIL
  - PROPOSED EASEMENT

# RAYMOND SOLAR

Dens Drive  
Raymond, Maine

**BLUEWAVE**

**bri**  
BIODIVERSITY RESEARCH INSTITUTE

**KREBS & LANSING**  
CONSULTING ENGINEERS  
164 Main Street, Suite 201  
Colchester, Vermont 05446  
P: (802) 878-0375  
www.krebsandlansing.com

ISSUED FOR PERMITTING  
NOT FOR CONSTRUCTION

**SOURCE DATA LEGEND**  
MAPPING SOURCE DATA USED FOR PLAN COMPILATION  
Civil Engineering:  
Krebs and Lansing Consulting Engineers, Inc.  
164 Main Street, Suite 201  
Colchester, Vermont 05446  
Environmental:  
Biodiversity Research Institute  
30 Danforth Street, Suite 213  
Portland, ME 04101  
Stormwater:  
BHM Inc.  
3809 Main Street  
Gorham, ME 04038

0' 150' 300' 450'  
1" = 150'  
STANDARD GRAPHIC SCALE (1" = 150')  
VALID WHEN PLOTTED ON 24" BY 36" MEDIA



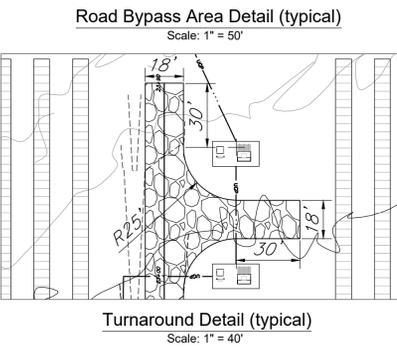
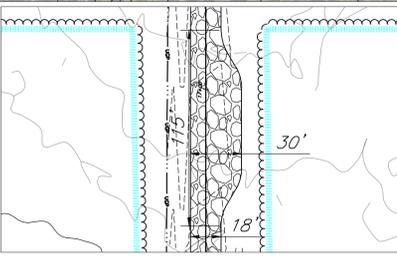
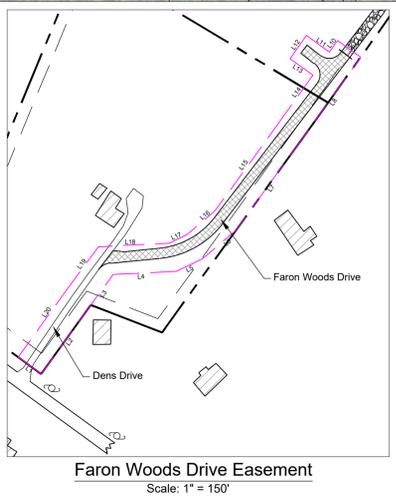
REV. NO.	REVISIONS/COMMENTS	DATE
1	Road stationing and SW treatment buffers	6/11/21
2	Revised Notes & Labels	7/6/21

Drawing Title:  
**OVERALL SITE PLAN**

DATE of Issue: 05/14/2021  
Drawn by: EJM  
Checked by: JAJ  
Project No.: 21235  
Scale: 1" = 150'  
Drawing No.:  
Rev No.:

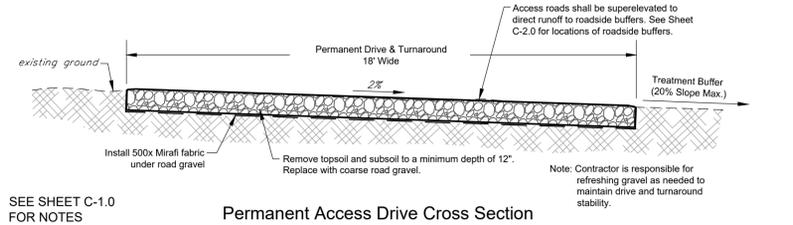
**Faron Woods Drive Easement**

Line	Bearing	Distance
L1	S 53° 48' 48" E	50.00'
L2	N 35° 52' 38" E	150.00'
L3	N 36° 42' 39" E	66.58'
L4	N 87° 02' 25" E	111.76'
L5	N 64° 30' 21" E	50.82'
L6	N 49° 49' 27" E	77.41'
L7	N 36° 01' 25" E	192.32'
L8	N 35° 43' 25" E	183.93'
L9	N 54° 16' 35" W	50.00'
L10	S 35° 43' 25" W	25.00'
L11	N 54° 16' 35" W	50.00'
L12	S 35° 43' 25" W	50.00'
L13	S 54° 16' 35" E	50.00'
L14	S 35° 43' 25" W	109.15'
L15	S 36° 01' 27" W	185.79'
L16	S 49° 49' 27" W	64.91'
L17	S 64° 30' 21" W	34.42'
L18	S 87° 02' 25" W	125.29'
L19	S 36° 42' 39" W	90.43'
L20	S 35° 52' 38" W	150.09'



Bluewave Solar is constructing a 4.99 MW Solar Generation Project and will access the property via Dens Drive. An 18' wide access road will need to be constructed through the existing CMP Transmission line in order to reach the rear portion of the property.

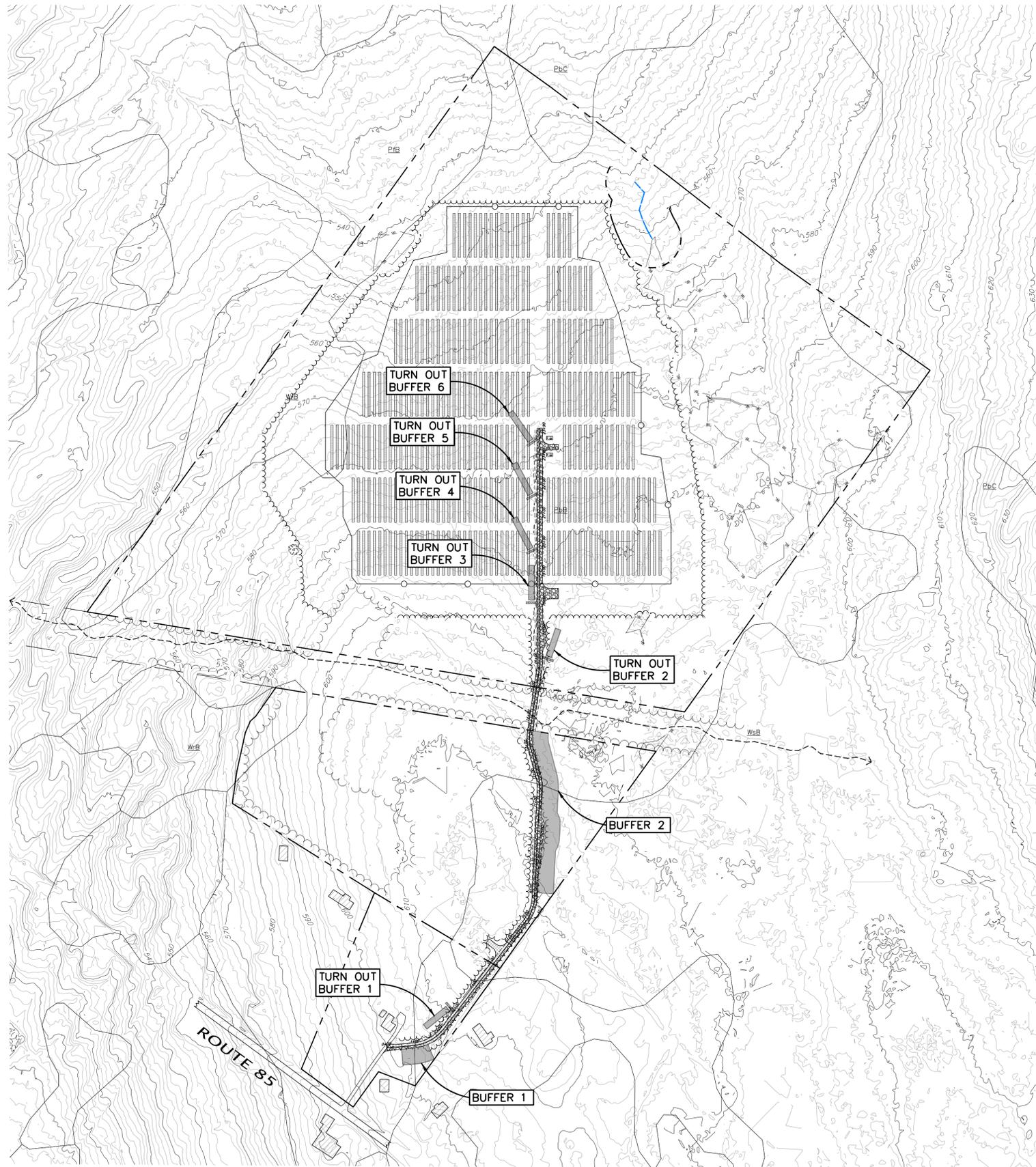
Town: Raymond  
County: Cumberland  
TL Section/Pole #: Section 208, Between Poles 174 and 175. See Plan.  
Tax Map/Lot #: Map 10, Lot 87A & 88; Map 9, Lot 4  
Deed Reference: 10068/022 April 10, 1992  
Access Road: Dens Drive  
Square footage of temporary construction access: None  
Width of proposed road: 18'



- NOTES:**
- ASPECTS OF PLAN ARE APPROXIMATE AND DERIVED FROM AERIAL PHOTOGRAPHY.
  - THE HORIZONTAL COORDINATE SYSTEM IS BASED ON NAD83 MAINE STATE PLANES, WEST ZONE (US SURVEY FEET). ELEVATIONS ARE BASED ON THE NAVD88 (US SURVEY FEET).
  - EXISTING GROUND CONTOUR ELEVATIONS ARE BASED ON LIDAR DATA FROM THE MAINE OFFICE OF GIS.
  - UTILITIES ARE NOT WARRANTED TO BE COMPLETE OR ACCURATE. CONTRACTOR SHALL CONTACT DIG SAFE BEFORE BEGINNING ANY EXCAVATION.
  - THIS IS A PRELIMINARY DESIGN PLAN. FINAL DESIGN WILL BE MODIFIED TO MATCH EQUIPMENT PURCHASED AND POSSIBLE PERMIT CONSTRAINTS REVEALED DURING PROJECT'S REVIEW.

**SOLAR ARRAY DESIGN INFORMATION:**  
6.50 MW DC  
4.99 MW AC  
DC/AC = 1.30  
540W PHOTOVOLTAIC MODULES  
12,040 MODULES  
40 MODULES PER STRING  
301 STRINGS  
PITCH = 18.34°  
GCR = 0.409  
LOD = 43.1 ACRES  
CLEARING = 41.8 ACRES  
FENCED AREA = 27.3 ACRES

SEE SHEET C-1.0 FOR NOTES



**Raymond Solar Project  
Water Quality Treatment Calculations  
(Linear Portion of Project)**

Road Width = 18 feet

Road ID	Start Station	End Station	BMP ID	Buffer Max. Slope (%)	Buffer Length (ft)	Impervious Area (sq. ft.)	Impervious Area Treated (sq. ft.)	Impervious Area Untreated (sq. ft.)	Cover Type	Soil Type	Buffer Length Required (ft)
Road 1	0+00	- 0+50	None			953		953		C. Sandy Loam	
Road 1	0+50	- 1+40	Buffer 1	7%	55	1,620	1,620	0	Forested	C. Sandy Loam	55
Road 1	1+40	- 2+85	None			2,610		2,610	Forested	C. Sandy Loam	100
Road 1	2+85	- 5+35	Turn Out 1	2%	100	4,500	4,500	0	Forested	C. Sandy Loam	100
Road 1*	5+35	- 7+85				5,868		5,868			
Road 1**	7+85	- 13+50	Buffer 2	11%	55	11,249	11,249	0	Forested	C. Sandy Loam	55
Road 1	13+50	- 16+00	Turn Out 2	4%	100	4,500	4,500	0	Forested	C. Sandy Loam	100
Road 1**	16+00	- 17+88	Turn Out 3	4%	120	3,892	3,892	0	Meadow	C. Sandy Loam	120
Road 1*	17+88	- 19+75	Turn Out 4	5%	120	5,792	5,792	0	Meadow	C. Sandy Loam	120
Road 1	19+75	- 21+63	Turn Out 5	5%	120	3,375	3,375	0	Meadow	C. Sandy Loam	120
Road 1	21+63	- 23+50	Turn Out 6	7%	120	4,743	4,743	0	Meadow	C. Sandy Loam	120
Road 1	23+50	- 23+90	None			736		736		C. Sandy Loam	
<b>Totals</b>						<b>49,838</b>	<b>39,672</b>	<b>10,167</b>			

\*Includes hammerhead turnaround around area  
\*\*Includes passing area

**Impervious Area Treatment Calculations (Linear project)**

Total Proposed Impervious Area=	49,838 sq. ft.	=	1.14 acres
Total Treated Proposed Impervious Area=	39,672 sq. ft.	=	0.91 acres
Total Untreated Proposed Impervious Area=	10,167 sq. ft.	=	0.23 acres
Proposed Impervious Area Treatment %=	<b>79.60 %</b>		

**Impervious Area Treatment Calculations (Non-Linear)**

Racking Posts Area=	50 sq. ft.
Fence Posts Area=	50 sq. ft.
Equipment Pad Area=	520 sq. ft.
Proposed Non-Linear Impervious Treatment* %	<b>100.00 %</b>

\*Non-Linear areas considered self treated by meadow conditions underlying the solar panels

NOTE:

- MEADOW CONDITIONS WILL BE MAINTAINED WITHIN THE SOLAR PANEL ARRAY AREAS. PANEL POSTS AND RACKS AS WELL AS PROJECT EQUIPMENT PADS ARE CONSIDERED SELF TREATED. MEADOW CONDITIONS WILL REMAIN VEGETATED AND WILL NOT BE MOWED MORE THAN TWICE PER YEAR.
- DEVELOPED AREA IS EQUAL TO IMPERVIOUS AREA, AS ALL DISTURBED AREAS WILL BE RESTORED AND MAINTAINED AS MEADOW, AND MEADOW CONDITIONS DO NOT MEET MAINE DEP'S DEFINITION OF "DEVELOPED" AREA.

LEGEND		SOILS LEGEND	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	BUFFER AREAS		SOIL BOUNDARY LINES
	LIMIT OF WETLANDS		LIMIT OF WETLANDS
	PROJECT BOUNDARY	HYDROLOGIC SOIL GROUP*	
		SYMBOL	SOIL GROUP
		PbB	PAXTON (3-8%) C
		PbC	PAXTON (8-15%) C
		PiB	PAXTON (3-8%) C
		WbB	WOODBIDGE (0-8%) C
		WbS	WOODBIDGE (0-8%) C

\* SOILS INFORMATION PROVIDED BY NRCS FROM USDA WEB SOIL SURVEY FOR YORK COUNTY, MAINE, SURVEY AREA DATA VERSION 19, DATED MAY 29, 2020.

**RAYMOND SOLAR**

Raymond, Maine

**BLUEWAVE**



**KREBS & LANSING CONSULTING ENGINEERS**

164 Main Street, Suite 201 Colchester, Vermont 05446 P: (802) 878-0375 www.krebsandlansing.com



Berry, Huff, McDonald, Milligan Inc. Engineers, Surveyors

380B Main Street Gorham, Maine 04038 Tel: (207) 839-2771 www.bh2m.com

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NOT FOR CONSTRUCTION**

SOURCE DATA LEGEND

MAPPING SOURCE DATA USED FOR PLAN COMPILATION  
Civil Engineering:  
Krebs and Lansing Consulting Engineers, Inc.  
164 Main Street, Suite 201  
Colchester, Vermont 05446  
Environmental:  
Boyle Associates  
254 Commercial Street  
Merrill's Wharf, Suite 101  
Portland, ME 04101  
Stormwater:  
BH2M Inc.  
380B Main Street  
Gorham, ME 04038



STANDARD GRAPHIC SCALE (1" = 200')  
VALID WHEN PLOTTED ON 24" BY 36" MEDIA



REV. NO.	REVISIONS/COMMENTS	DATE

Drawing Title:

**RAYMOND SOLAR PROJECT  
STORMWATER TREATMENT**

DATE of Issue: 7/13/2021  
Drawn by: BKM Checked by: SJB  
Project No.: 21075 Scale: 1" = 200'  
Drawing No.: Rev No.:

**C-2.0**

# RAYMOND SOLAR

Raymond, Maine

## BLUEWAVE

**bri**  
BIODIVERSITY RESEARCH INSTITUTE

**KREBS & LANSING**  
CONSULTING ENGINEERS  
164 Main Street, Suite 201 Colchester, Vermont 05446  
P. (802) 878-0375  
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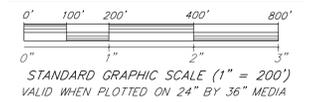
### SOURCE DATA LEGEND

MAPPING SOURCE DATA USED FOR PLAN COMPILATION

Civil Engineering:  
Krebs and Lansing Consulting Engineers, Inc.  
164 Main Street, Suite 201  
Colchester, Vermont 05446

Environmental:  
Boyle Associates  
254 Commercial Street  
Merrill's Wharf, Suite 101  
Portland, ME 04101

Stormwater:  
BH2M Inc.  
380B Main Street  
Gorham, ME 04038



REV. NO.	REVISIONS/COMMENTS	DATE

Drawing Title:  
**RAYMOND SOLAR PROJECT  
PRE-DEVELOPMENT  
STORMWATER**

DATE of Issue: 7/13/2021  
Drawn by: BKM  
Project No.: 21075  
Drawing No.: C-3.0

Checked by: SJB  
Scale: 1" = 200'  
Rev No.:



**SOILS LEGEND**

SYMBOL	DESCRIPTION
—	SOIL BOUNDARY LINES
—w—	LIMIT OF WETLANDS

**HYDROLOGIC SOIL GROUP\***

SYMBOL	SOIL	GROUP
PbB	PAXTON (3-8%)	C
PbC	PAXTON (8-15%)	C
PfB	PAXTON (3-8%)	C
WbB	WOODBIDGE (0-8%)	C
WbC	WOODBIDGE (0-8%)	C

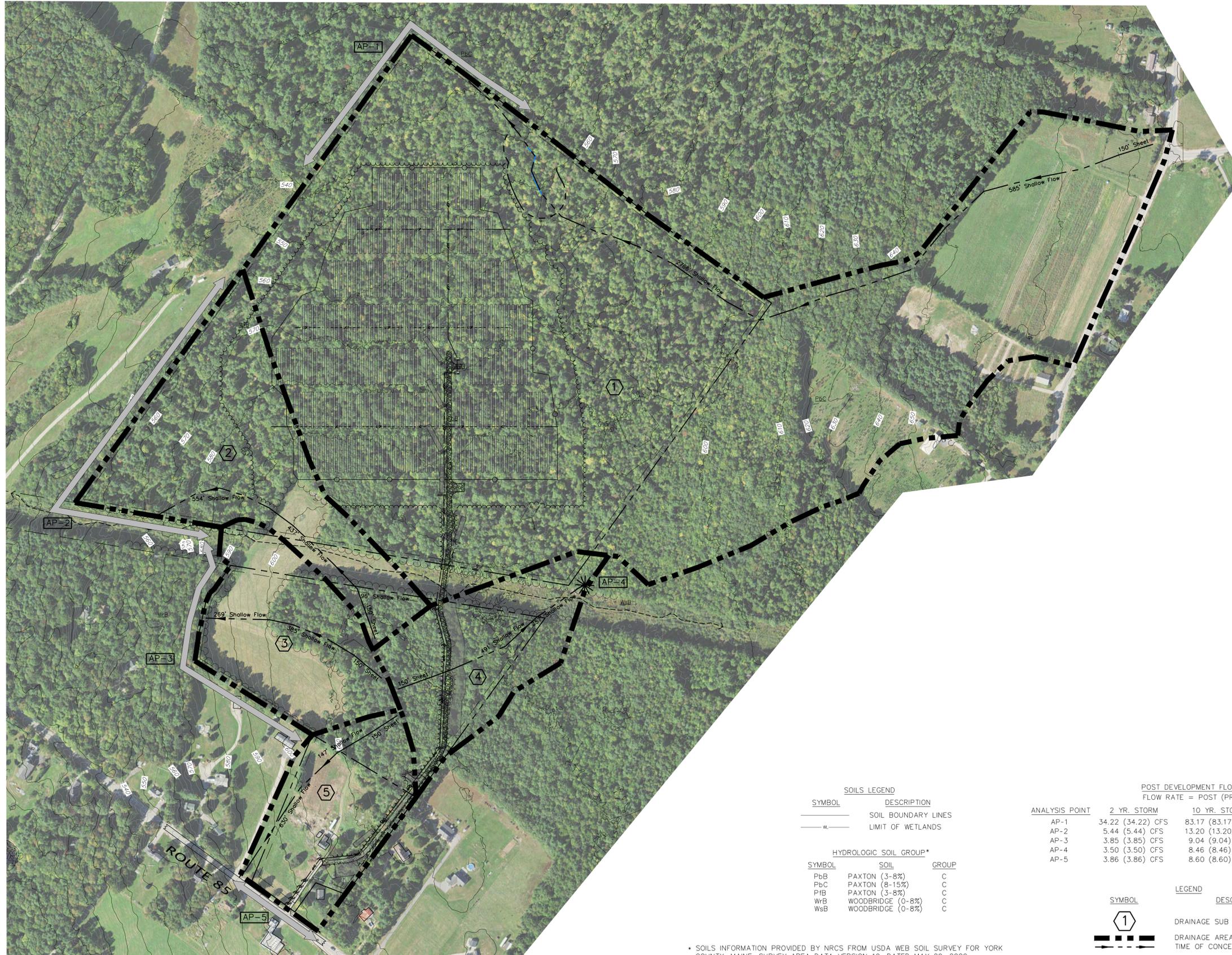
**PRE DEVELOPMENT FLOWS**

ANALYSIS POINT	2 YR. STORM	10 YR. STORM	25 YR. STORM
AP-1	34.22 CFS	83.17 CFS	127.77 CFS
AP-2	5.44 CFS	13.20 CFS	20.28 CFS
AP-3	3.85 CFS	9.04 CFS	13.73 CFS
AP-4	3.50 CFS	8.46 CFS	12.98 CFS
AP-5	3.86 CFS	8.60 CFS	12.80 CFS

**SYMBOL LEGEND DESCRIPTION**

①	DRAINAGE SUB AREA
—	DRAINAGE AREA BOUNDARY
→	TIME OF CONCENTRATION ROUTE

\* SOILS INFORMATION PROVIDED BY NRCS FROM USDA WEB SOIL SURVEY FOR YORK COUNTY, MAINE, SURVEY AREA DATA VERSION 19, DATED MAY 29, 2020.



# RAYMOND SOLAR

Raymond, Maine



**ISSUED FOR PERMITTING  
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**SOURCE DATA LEGEND**  
 MAPPING SOURCE DATA USED FOR PLAN COMPILATION  
 Civil Engineering:  
 Krebs and Lansing Consulting Engineers, Inc.  
 164 Main Street, Suite 201  
 Colchester, Vermont 05446  
 Environmental:  
 Boyle Associates  
 254 Commercial Street  
 Merrill's Wharf, Suite 101  
 Portland, ME 04101  
 Stormwater:  
 BH2M Inc.  
 380B Main Street  
 Gorham, ME 04038



REV. NO.	REVISIONS/COMMENTS	DATE

Drawing Title:  
**RAYMOND SOLAR PROJECT  
 POST-DEVELOPMENT  
 STORMWATER**

DATE of Issue: 7/13/2021  
 Drawn by: BKM Checked by: SJB  
 Project No.: 21075 Scale: 1" = 200'  
 Drawing No.: Rev No.:

**C-3.1**

**SOILS LEGEND**

SYMBOL	DESCRIPTION
—	SOIL BOUNDARY LINES
—	LIMIT OF WETLANDS

**HYDROLOGIC SOIL GROUP\***

SYMBOL	SOIL	GROUP
PbB	PAXTON (3-8%)	C
PbC	PAXTON (8-15%)	C
PtB	PAXTON (3-8%)	C
WrB	WOODBIDGE (0-8%)	C
WsB	WOODBIDGE (0-8%)	C

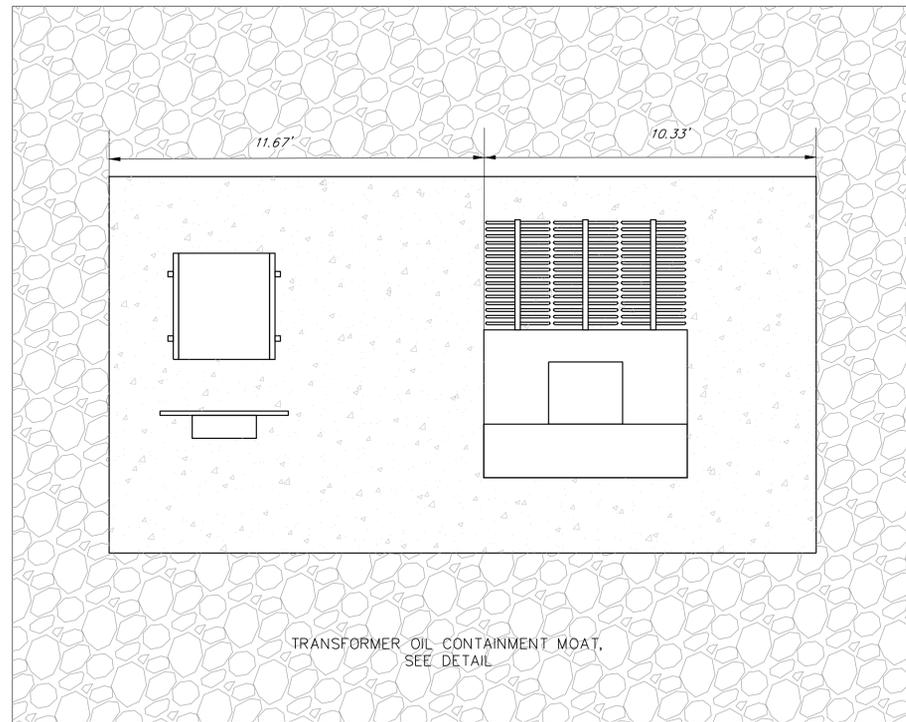
**POST DEVELOPMENT FLOWS**  
 FLOW RATE = POST (PRE)

ANALYSIS POINT	2 YR. STORM	10 YR. STORM	25 YR. STORM
AP-1	34.22 (34.22) CFS	83.17 (83.17) CFS	127.77 (127.77) CFS
AP-2	5.44 (5.44) CFS	13.20 (13.20) CFS	20.28 (20.28) CFS
AP-3	3.85 (3.85) CFS	9.04 (9.04) CFS	13.73 (13.73) CFS
AP-4	3.50 (3.50) CFS	8.46 (8.46) CFS	12.98 (12.98) CFS
AP-5	3.86 (3.86) CFS	8.60 (8.60) CFS	12.80 (12.80) CFS

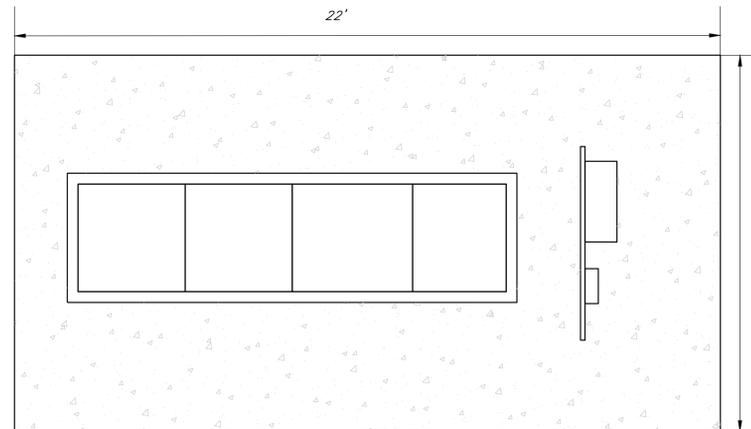
**LEGEND**

SYMBOL	DESCRIPTION
①	DRAINAGE SUB AREA
—	DRAINAGE AREA BOUNDARY
—	TIME OF CONCENTRATION ROUTE

\* SOILS INFORMATION PROVIDED BY NRCS FROM USDA WEB SOIL SURVEY FOR YORK COUNTY, MAINE, SURVEY AREA DATA VERSION 19, DATED MAY 29, 2020.



Schematic of Transformer and Grounding Transformer Pad With Secondary Oil Containment



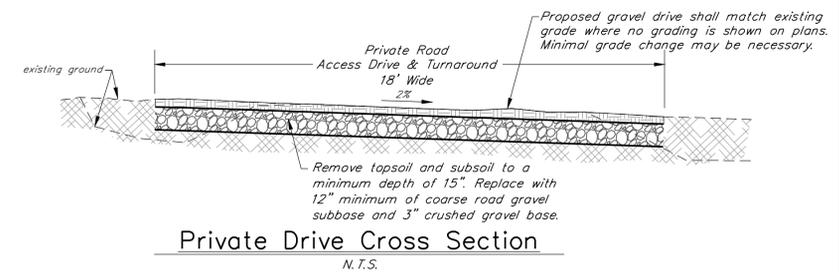
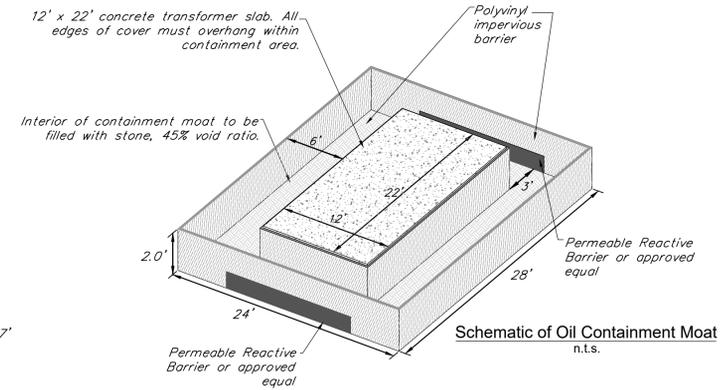
Schematic of Inverter/Switchgear and Other Miscellaneous Electrical Equipment Pad

NOTE: SEE SECONDARY OIL CONTAINMENT DETAIL AND SPCC PLAN

CONTRACTOR TO PROVIDE SEVEN PRE-CAST CONCRETE SLABS, SIX FOR TRANSFORMERS AND ONE FOR THE SWITCHGEAR AND OTHER PROJECT ELECTRICAL EQUIPMENT  
NOTE: POURED IN PLACE SLABS ARE ACCEPTABLE AS AN ALTERNATIVE

**VOLUME CALCULATIONS:**

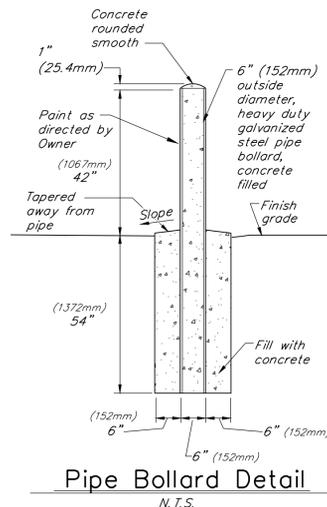
**Required Capacity:**  
125% of the 550 Gallons of Transformer Oil = 687.5 gal. = 92.0 c.f.  
  
Required minimum freeboard (24-hour storm for the 25 Year Storm) = 4.78" or 0.40'  
Containment Area & Pad = 28 x 24' = 672 s.f.  
Volume of freeboard required = 672 s.f. x 0.40 ft. = 268.8 c.f.  
  
Total Capacity Required = 92.0 c.f. + 268.8 c.f. = 360.8 c.f.  
  
**Capacity Provided in Secondary Oil Containment System:**  
Area of containment = (28x24') - (12x22') = 408.0 s.f.  
Volume of Containment = 408.0 s.f. x 2.0' of depth = 816.0 c.f.  
When filled with stone with 45% void ratio = 816.0 c.f. \* 0.45 = 367.2 c.f.  
Total Capacity Provided = 367.2 c.f. > 360.8 c.f. required



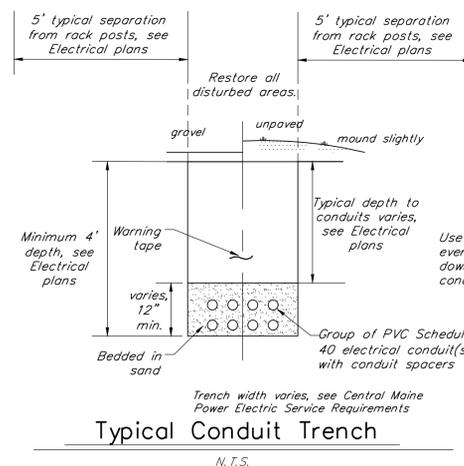
Private Drive Cross Section  
N.T.S.

**Construction Notes**

- The methods and materials of construction shall be in conformance with all permits and approvals issued for the project. In case of conflict, the more stringent specification shall apply as directed by Engineer. All work shall be done in a workmanlike manner and completed in the time specified by Owner.
- The Contractor shall be responsible for all work and materials shown and required to make the job complete. These drawings do not show every fitting or appurtenance. Materials shall be as specified on the drawings. Manufacturer's product specifications shall be submitted for all materials to the Engineer for approval prior to installation.
- The location and size of existing underground utilities is not warranted to be exact or complete. The Contractor shall field locate all utilities and shall contact the affected utility company, the Engineer and the Town prior to making any hook ups. The Contractor shall be solely responsible for all existing utilities and their uninterrupted services. All off-site backfill, sheeting and shoring, dewatering, clearing and grubbing, erosion control, dust control, traffic control, grading, and all incidentals shall be included as part of the required work.
- The Contractor shall verify all temporary bench marks before use.
- The workmen and public shall be protected by the Contractor from any and all hazards connected with the construction work. Open trenches, materials, or equipment within the working limits are to be guarded by the use of adequate barricades or flagmen. All barricades left in position overnight are to be properly lighted. Kerosene pots are not acceptable. When work narrows the usable pavement, flagmen shall be employed to aid the flow of traffic so that there will be no undue delays. The Contractor shall be held responsible for the safety of all workmen and the general public and all damages to property occurring from or upon the work occasioned by negligence or otherwise growing out of a failure on the part of the Contractor to protect persons or property from hazards of open trenches, materials, or equipment at any time of the day or night within the working area. All work shall be in conformance to OSHA regulations, Title 19, Parts 1926.651 and 1926.652.
- The Contractor shall verify all utility intersections and contact Engineer and Owner with conflicts.
- The Contractor shall call Dig Safe or other approved equal underground utility identifier prior to any excavation.
- The Contractor shall coordinate with final electrical, structural and landscaping plans.



Pipe Bollard Detail  
N.T.S.



Typical Conduit Trench  
N.T.S.

The excavation contractor shall be responsible for complying with OSHA regulations. All backfill shall be compacted to 95% of the Standard Proctor Value.

**Conduit Trenching Notes:**

- The methods and materials of construction shall conform to the latest standards of the Central Maine Power's Handbook of Requirements and the State of Maine. All work shall be in conformance with all permits and approvals issued for the project. In case of conflict, the more stringent specification shall apply as directed by the Owner's Representative.
- The Excavation Contractor shall dig the conduit trenching and assist the Electrician in placing the conduit. The conduits shall be placed with conduit spacers when more than two conduits are placed in a trench. All conduit and spacers shall be provided by the Electrical Contractor.
- The Excavation Contractor shall allow sufficient time for the conduit to be inspected prior to backfilling. If any conduit is backfilled without inspection it will be the Excavation Contractor's responsibility to uncover the conduit for inspection and backfill the trench without charge.
- The workers and public shall be protected by the excavation contractor from any and all hazards connected with the construction work. Open trenches, materials, or equipment within the working limits are to be guarded by the use of adequate barricades or flaggers. All barricades left in position overnight are to be properly lighted. When work narrows the usable pavement, flaggers shall be employed to aid the flow of traffic so that there will be no undue delays. All work shall be in conformance to OSHA regulations, Title 19, Parts 1926.651 and 1926.652.
- All conduit crossing gravel areas or grass path areas shall be encased in concrete. Concrete encasement shall be in accordance with Central Maine Power's Handbook of Regulations and the Electrical plans.
- The Excavation Contractor is responsible for compacting all trench backfill to 95% of the Standard Proctor Value.
- The Excavation Contractor is responsible for all conduit excavation and backfill necessary to complete the project.

**RAYMOND SOLAR**

Dens Drive  
Raymond, Maine

**BLUEWAVE**

**bri**  
BIODIVERSITY RESEARCH INSTITUTE

**KREBS & LANSING**  
CONSULTING ENGINEERS  
164 Main Street, Suite 201  
Colchester, Vermont 05446  
P: (802) 878-0375  
www.krebsandlansing.com

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NOT FOR CONSTRUCTION

**SOURCE DATA LEGEND**

MAPPING SOURCE DATA USED FOR PLAN COMPILATION	
Civil Engineering:	Krebs and Lansing Consulting Engineers, Inc. 164 Main Street, Suite 201 Colchester, Vermont 05446
Environmental:	Biodiversity Research Institute 30 Danforth Street, Suite 213 Portland, ME 04101
Stormwater:	BH2M Inc. 3808 Main Street Gorham, ME 04038



REV. NO.	REVISIONS/COMMENTS	DATE

Drawing Title:

**RAYMOND SOLAR  
STANDARD DETAILS**

DATE of Issue: 7/14/2021

Drawn by: EJM Checked by: IAJ

Project No.: 21235 Scale: N/A

Drawing No.: C-4.0 Rev No.:

**C-4.0**

**EROSION AND SEDIMENT CONTROL PLAN**

THIS PLAN HAS BEEN DEVELOPED AS A STRATEGY TO CONTROL SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION. THIS PLAN IS BASED ON THE STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION IN DEVELOPING AREAS AS CONTAINED IN THE LATEST REVISION OF THE 2016 MAINE EROSION AND SEDIMENT CONTROL BMP'S MANUAL FOR DESIGNERS AND ENGINEERS, AND THE LATEST REVISION TO THE 2014 MAINE EROSION AND SEDIMENT CONTROL FIELD GUIDE FOR CONTRACTORS. SEE MANUALS FOR ADDITIONAL INFORMATION AND DETAILS.

THE PROPOSED LOCATIONS OF SILTATION AND EROSION CONTROL STRUCTURES ARE SHOWN ON THE SITE PLAN.

- ALL CONSTRUCTION INSPECTIONS SHALL BE CONDUCTED BY SOMEONE WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROL, INCLUDING STANDARDS AND PERMIT CONDITIONS. CONSTRUCTION INSPECTIONS SHALL BE PERFORMED AT LEAST ONCE A WEEK, AND PRIOR TO AND 24 HOURS AFTER A WET WEATHER EVENT (0.5 INCHES OR MORE IN A 24 HOUR PERIOD). CONSTRUCTION INSPECTION AND CORRECTIVE ACTION DOCUMENTATION RECORDS SHALL BE MAINTAINED FOR A MINIMUM OF 5 YEARS.
- THE SCOPE OF CONSTRUCTION INSPECTIONS INCLUDE THE EROSION AND SEDIMENTATION CONTROL MEASURES AS WELL AS DISTURBED AREAS, MATERIAL STORAGE AREAS, AND LOCATIONS WHERE VEHICLES ENTER AND EXIT THE SITE.
- ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL BMP'S", DEPARTMENT OF ENVIRONMENTAL PROTECTION, LATEST REVISION.
- THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNTREATED OR UNVEGETATED CONDITION FOR A MINIMUM TIME. AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL. IF THE DISTURBANCE IS WITHIN 75 FEET OF A WETLAND OR WATERBODY, THE AREA SHALL BE STABILIZED WITHIN 2 DAYS OR PRIOR TO ANY STORM EVENT, WHICHEVER COMES FIRST.
- SEDIMENT BARRIERS (EROSION CONTROL MIX, STONE CHECK DAMS, STABILIZED CONSTRUCTION ENTRANCE, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM. THE CONTRACTOR SHALL MAINTAIN THE STABILIZED CONSTRUCTION ENTRANCE UNTIL ALL DISTURBED AREAS ARE STABILIZED.
- INSTALL EROSION CONTROL MIX AT TOE OF SLOPE TO FILTER SILT FROM RUNOFF. SEE E.C. MIX DETAIL FOR PROPER INSTALLATION. EROSION CONTROL MIX WILL BE REPLACED IN PLACE PER NOTE #7. THE USE OF AN EROSION CONTROL MIX BERM IS PROHIBITED AT THE BASE OF SLOPES STEEPER THAN 8% OR WHERE THERE IS FLOWING WATER.
- ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED, AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY BEFORE AND FOLLOWING ANY SIGNIFICANT RAINFALL (0.5 INCH OR MORE IN A 24-HOUR PERIOD) OR SNOW MELT OR WHEN NO LONGER SERVICEABLE AND TO SEDIMENT ACCUMULATION OR DECOMPOSITION. IF AN INSPECTION DETERMINES THAT A CORRECTIVE ACTION IS REQUIRED, THE ACTION OR REPAIR SHALL BE COMPLETED BY THE END OF THE NEXT WORKDAY AND COMPLETED WITHIN SEVEN DAYS OR BEFORE THE NEXT STORM EVENT. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS ABOVE ARE STABILIZED BY TURF EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS OF PERMANENT STABILIZATION. PERMANENT STABILIZATION IS 90% GRASS CATCH IN VEGETATED AREAS.
- NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN ONE AND ONE HALF TO ONE (1.5 TO 1).
- IF FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST, USE TEMPORARY MULCHING (DORMANT SEEDING MAY BE ATTEMPTED AS WELL) TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED PERIOD.
- DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND GRADED ONTO OPEN AREAS. POST SEEDING SEDIMENT, IF ANY WILL BE DISPOSED OF IN AN ACCEPTABLE MANNER.
- REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND PREPARED FOR FINAL SEEDING AS FOLLOWS:
  - PROVIDE LOAM, EROSION CONTROL MIX, AND COMPOST OVER DISTURBED AREAS AND SMOOTH TO A UNIFORM SURFACE AS REQUIRED TO PROMOTE GROWTH OF VEGETATION.
  - APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TESTING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 800 POUNDS PER ACRE OR 184 POUNDS PER 1,000 SQUARE FEET USING 10-20-20 (N-P205-K20) OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 1 TONS PER ACRE (138 LB PER 1,000 SQ. FT.).
  - FOLLOWING SEED BED PREPARATION, DITCHES AND BACK SLOPES WILL BE SEEDED WITH NEW ENGLAND CONSERVATION MIXTURE BY NEW ENGLAND WETLAND PLANTS, INC., OF AMHERST, MASSACHUSETTS OR APPROVED EQUAL.
  - HAY MULCH AT THE RATE OF 70-90 LBS PER 1000 SQUARE FEET FOR OVER 75% COVERAGE. FOR UNPROTECTED OR WINDY AREAS, ANCHOR MULCH WITH PEG AND TWINE (1.50 YD/BLOCK). HYDRAULIC MULCHES MAY ALSO BE USED, APPLIED AT A RATE OF 5 LBS PER 1000 SQUARE FEET FOR PAPER MULCH OR 40 LBS PER 1000 SQUARE FEET OR AS DIRECTED BY THE MANUFACTURER. ON SLOPES GREATER THAN 3:1 EROSION CONTROL MIX MAY BE USED. SEE EROSION CONTROL MIX NOTES BELOW.
  - FOR DISTURBED AREAS TO BE MAINTAINED IN POST-CONSTRUCTION AS A MEADOW BUFFER, APPLY NEW ENGLAND CONSERVATION MIXTURE BY NEW ENGLAND WETLAND PLANTS, INC., OF AMHERST, MASSACHUSETTS OR APPROVED EQUAL.
- ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS ONCE THE SITE IS STABILIZED WITH 90% GRASS CATCH IN VEGETATED AREAS. TEMPORARY EROSION AND SEDIMENT CONTROL BLANKET SHALL BE USED IN ALL DITCHES AND SWALES WITH GRADES ABOVE 5% AS SHOWN IN DETAILS.
- WETLANDS WILL BE PROTECTED WITH EROSION CONTROL MIX OR SILT FENCE INSTALLED AT THE EDGE FOR THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE. SEE EROSION CONTROL PLAN. ALL AREAS WITHIN 75 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIERS DURING WINTER CONSTRUCTION.
- ALL STORMWATER WILL BE PREVENTED FROM RUNNING ONTO STOCKPILES. SEDIMENT BARRIERS WILL BE INSTALLED DOWNGRADIENT OF ALL STOCKPILES.
- PERMANENT POST-CONSTRUCTION BMP'S (VEGETATED SWALES, WET POND, ETC.) WILL NOT BE USED TO MANAGE FLOWS DURING CONSTRUCTION WITHOUT SPECIAL PROTECTION AND/OR RESTORATION.

**ADDITIONAL TEMPORARY SEED MIXTURE (FOR PERIODS LESS THAN 12 MONTHS):**

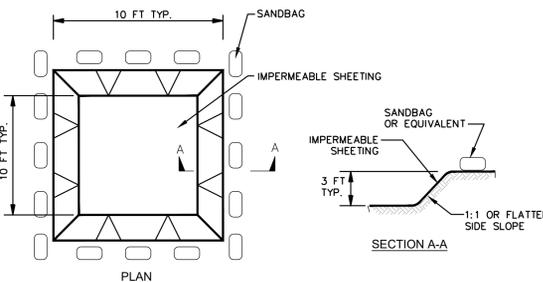
SEASON	SEED	RATE
SUMMER (5/15 - 8/15)	SUDANGRASS	40 LBS/ACRE
	OATS	80 LBS/ACRE
LATE SUMMER/EARLY FALL (8/15 - 9/15)	PERENNIAL RYEGRASS	40 LBS/ACRE
FALL (9/15 - 11/1)	WINTER RYE	112 LBS/ACRE
WINTER (11/1 - 4/1)	MULCH W/ DORMANT SEED	80 LBS/ACRE*
SPRING (4/1 - 7/1)	OATS	80 LBS/ACRE
	ANNUAL RYEGRASS	40 LBS/ACRE

\*SEED RATE ONLY

**EROSION CONTROL MIX**

EROSION CONTROL MIX (ECM) SHALL MEET THE REQUIREMENTS PROVIDED IN THE LATEST REVISION OF MAINE DEP'S EROSION AND SEDIMENTATION CONTROL BMP MANUAL. ECM IS ACCEPTABLE FOR USE ON SLOPES OF GREATER THAN 3:1 BUT LESS THAN 1:1. ECM SHALL CONSIST OF WELL-GRADED ORGANIC COMPONENT 50 - 100% OF DRY WEIGHT, AND COMPRISED OF FIBROUS AND ELONGATED FRAGMENTS. ECM SHALL BE FREE FROM REFUSE, MATERIAL TOXIC TO PLANT GROWTH OR CONSTRUCTION DEBRIS. ECM SHALL BE EVENLY DISTRIBUTED AND APPLIED AT A THICKNESS OF 2" ON 3:1 SLOPES, WITH AN ADDITIONAL 1/2" PER 20' OF SLOPE FOR A MAXIMUM OF 100' IN LENGTH. SLOPES GREATER THAN 3:1, ECM SHALL BE APPLIED AT THICKNESS OF 4" OR 5" FOR SLOPES GREATER THAN 60' IN LENGTH.

SLOPES GREATER THAN 3:1 MAY ALSO REQUIRE ADDITIONAL SLOPE STABILIZATION DEPENDING ON UPGRADENT RUNOFF AND OTHER SITE SPECIFIC CONDITIONS. SEE SLOPE STABILIZATION DETAIL FOR ADDITIONAL INFORMATION.



**CONSTRUCTION SPECIFICATIONS**

- LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
- SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
- PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
- PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
- KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM DRAINAGE LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.

**CONCRETE WASHOUT STRUCTURE**

NTS

**EROSION CONTROL DURING CONSTRUCTION**

**WINTER CONSTRUCTION**

- WINTER CONSTRUCTION PERIOD: NOVEMBER 1 THROUGH APRIL 15
- TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED BY SEPTEMBER 1 OR 45 DAYS PRIOR TO THE FIRST KILLING FROST (OCT. 15) TO PROTECT FROM SPRING RUNOFF PROBLEMS.
- CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO MORE THAN ONE ACRE OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION.
- OVERWINTER STABILIZATION OF DITCHES AND CHANNELS:
  - INSTALL A SOIL LINING IN THE DITCH: A DITCH MUST BE LINED WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES: PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING SOD AT THE BASE OF THE DITCH WITH PLASTIC MESH TO PREVENT THE SOD FROM SLOUGHING DURING FLOW CONDITIONS. SEE THE PERMANENT VEGETATION BMP SECTION.
  - INSTALL A STONE LINING IN THE DITCH: A DITCH MUST BE LINED WITH STONE RIPRAP BY NOVEMBER 15. A REGISTERED PROFESSIONAL ENGINEER MUST BE HIRED TO DETERMINE THE STONE SIZE AND LINING THICKNESS NEEDED TO WITHSTAND THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHIN THE FOLLOWING: IF NECESSARY, THE CONTRACTOR WILL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.
- OVERWINTER STABILIZATION OF DISTURBED SLOPES:
  - ALL STONE-COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY NOVEMBER 15. ALL SLOPES TO BE VEGETATED MUST BE SEEDED AND MULCHED BY SEPTEMBER 1. THE DEPARTMENT WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 15% TO BE A SLOPE. IF A SLOPE TO BE VEGETATED IS NOT STABILIZED BY SEPTEMBER 1, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER: STABILIZE THE SLOPE WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS. BY OCTOBER 1 THE DISTURBED SLOPE MUST BE SEEDED WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND THEN INSTALL EROSION CONTROL MATS OR ANCHORED MULCH OVER THE RYE. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE SLOPE BY NOVEMBER 1, THEN THE CONTRACTOR WILL COVER THE SLOPE WITH A LAYER OF EROSION CONTROL MIX OR WITH STONE RIPRAP AS DESCRIBED IN THE FOLLOWING STANDARDS.
  - STABILIZE THE SOIL WITH SOD: THE DISTURBED SLOPE MUST BE STABILIZED WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES: PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE CONTRACTOR WILL NOT USE LATE SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3k:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
  - STABILIZE THE SOIL WITH MULCH: BY NOVEMBER 15, MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET OR THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. IMMEDIATELY AFTER APPLYING THE MULCH, ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT AND FROM MOVING THE MULCH OFF THE DISTURBED SOIL. PROVIDE NETTING ON ALL SLOPES GREATER THAN 8%.
  - MAINTENANCE: IF AN INSPECTION DETERMINES THAT A CORRECTIVE ACTION IS REQUIRED, THE ACTION OR REPAIR SHALL BE STARTED BY THE END OF THE NEXT WORKDAY AND COMPLETED WITHIN SEVEN DAYS OR BEFORE THE NEXT STORM EVENT. MAINTENANCE MEASURES SHALL BE APPLIED AS NEEDED TO PREVENT CONSTRUCTION SEASON OIL, MUD OR OTHER CONTAMINANTS FROM ACCUMULATING. SHOW STORM OR PERIOD OF THAWING AND RUNOFF. THE SITE CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES AS NEEDED TO INSURE THEIR CONTINUOUS FUNCTION. FOLLOWING THE TEMPORARY AND/OR FINAL SEEDING AND MULCHING, THE CONTRACTOR SHALL, IN THE SPRING, INSPECT AND REPAIR ANY DAMAGES AND/OR BARE SPOTS. AN ESTABLISHED VEGETATIVE COVER MEANS A MINIMUM OF 85 TO 90% OF AREAS VEGETATED WITH VIGOROUS GROWTH.

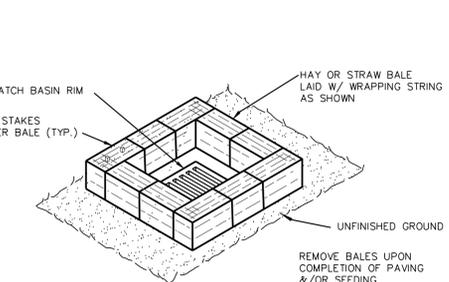
**STABILIZATION SCHEDULE BEFORE WINTER:**

- SEPTEMBER 15 ALL DISTURBED AREAS MUST BE SEED AND MULCHED. ALL GRASS LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR AN EROSION CONTROL BLANKET.
- OCTOBER 1 IF THE SLOPE IS STABILIZED WITH AN EROSION CONTROL BLANKET AND SEED, ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANNUAL GRASS MUST BE SEED AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND MULCHED.
- NOVEMBER 15 ALL STONE LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED. SLOPES THAT ARE COVERED WITH RIPRAP MUST BE CONSTRUCTED BY THIS DATE.

**SPILL PREVENTION:**

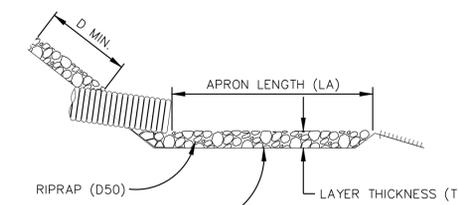
- SPILL PREVENTION: CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS 1. ON SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESTORATION IMPLEMENTATION.
- GROUNDWATER PROTECTION: DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAINING TO AN INFILTRATION AREA. AN "INFILTRATION AREA" IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOIL TOPOGRAPHY AND OTHER RELEVANT FACTORS ACCUMULATES RUNOFF THAT INFILTRATES INTO THE SOIL. DUMPS, SHELTERS, AND OTHER FORMS OF SECONDARY CONTAMINATION THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS.
- EROSION CONTROL: EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED TO PREVENT EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. ON-SITE TRACKING OF MUD OR SEDIMENT SHALL BE VACUUMED IMMEDIATELY AND PRIOR TO THE NEXT SIGNIFICANT STORM EVENT.
- DEBRIS AND OTHER MATERIALS: LITTER, CONSTRUCTION DEBRIS, AND CHEMICALS EXPOSED TO STORMWATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.
- TRENCH OR FOUNDATION DE-WATERING: TRENCH DE-WATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDING, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER MUST BE REMOVED FROM THE PONDING AREA, EITHER THROUGH GRAVITY OR PUMPING, AND MUST BE SPREAD THROUGH NATURAL WOODED BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COFFERDAM SEDIMENTATION BASIN AND ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE DEPARTMENT.
- NON-STORMWATER DISCHARGES: IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES, WHERE ALLOWED. NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHOULD BE TAKEN TO ENSURE THE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENT(S) OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE:
  - DISCHARGES FROM FIREFIGHTING ACTIVITY;
  - FIRE HYDRANT FLUSHINGS;
  - VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE AND TRANSMISSION WASHING IS PROHIBITED);
  - DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX (C)(3) OF MAINE DEP 06-096 CHAPTER 500;
  - ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;
  - PAVEMENT WASHWATER (WHERE SPILLS/LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED, UNLESS ALL SPILLED MATERIAL HAS BEEN REMOVED);
  - UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE;
  - UNCONTAMINATED GROUNDWATER OR SPRING WATER;
  - FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;
  - UNCONTAMINATED EXCAVATION DEWATERING (SEE REQUIREMENTS IN APPENDIX (C)(5) MAINE DEP 06-096 CHAPTER 500);
  - POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND
  - LANDSCAPE IRRIGATION.
- UNAUTHORIZED NON-STORMWATER DISCHARGES: THE DEPARTMENT'S APPROVAL UNDER THIS CHAPTER DOES NOT AUTHORIZE A DISCHARGE THAT IS MIXED WITH A SOURCE OF NON-STORMWATER, OTHER THAN THOSE DISCHARGES IN COMPLIANCE WITH APPENDIX (C)(5) MAINE DEP 06-096 CHAPTER 500. SPECIFICALLY, THE DEPARTMENT'S APPROVAL DOES NOT AUTHORIZE DISCHARGES OF THE FOLLOWING:
  - WASTEWATER FROM THE WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;
  - FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE;
  - SOAPS, SOLVENTS, OR DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING; AND
  - TOXIC OR HAZARDOUS SUBSTANCES FROM A SPILL OR OTHER RELEASE.
- ADDITIONAL REQUIREMENTS: ADDITIONAL REQUIREMENTS MAY BE APPLIED ON A SITE-SPECIFIC BASIS.

**LOW POINTS**



**LOW POINTS SEDIMENT CONTROL BARRIER**

NTS

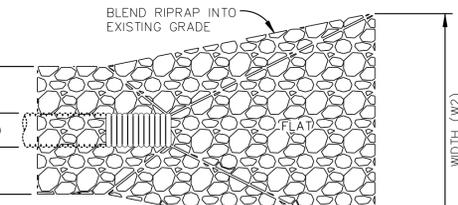


**PIPE OUTLET PROTECTION**

NTS

**APRON SCHEDULE**

CULV. DIA. (D)	D50 (IN.)	T (IN.)	LA (FT.)	W1 (FT.)	W2 (FT.)
12" OR LESS	6"	15"	10'	3'	13'
15"	6"	15"	10'	3.75'	14'
18"	6"	15"	12'	4.5'	17'
24"	6"	15"	14'	6'	20'
30"	6"	15"	18'	7.5'	26'
36"	6"	18"	24'	9'	33'
42"	12"	24"	30'	10.5'	41'
48"	12"	24"	34'	12'	46'
60"	18"	32"	38'	15'	53'



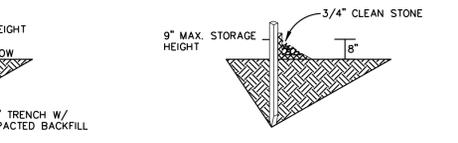
**STABILIZED CONSTRUCTION ENTRANCE**

NTS



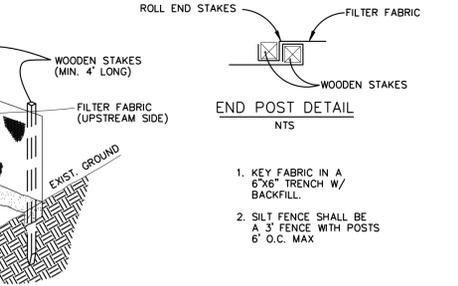
**WOOD STAKE TRENCH**

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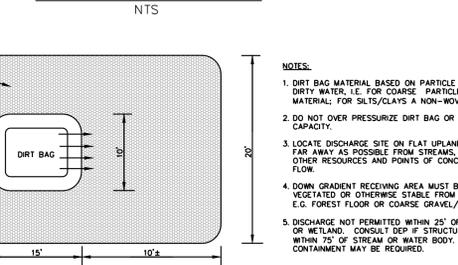
**END POST DETAIL**

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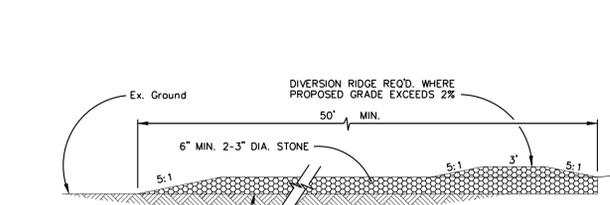
**SILT FENCE DETAIL**

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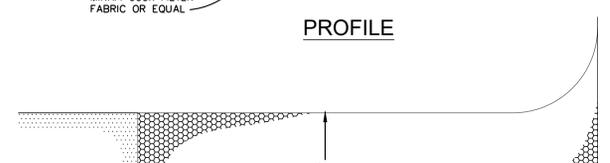
**PUMPED DISCHARGE SEDIMENT CONTROL DEVICE ("DIRT BAG")**

NTS



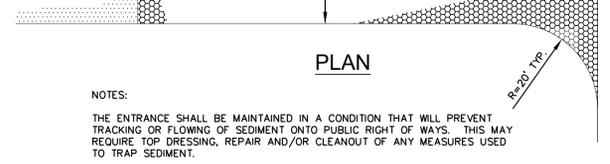
**STONE CHECK DAM DETAIL**

NTS



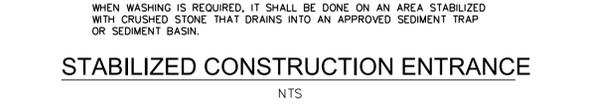
**EROSION CONTROL MIX BERM**

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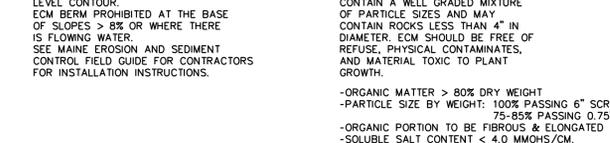
**ELEVATION**

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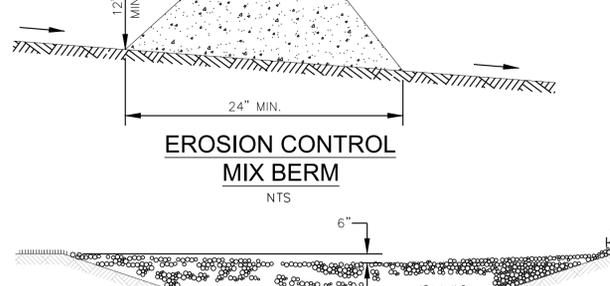
**CROSS SECTION**

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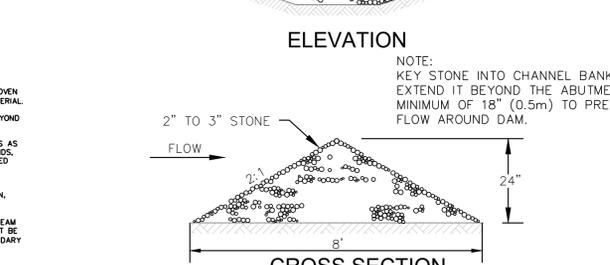
**SPACING**

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**STONE CHECK DAM DETAIL**

NTS



**SPACING**

NTS

**NOTE:** KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" (0.5m) TO PREVENT FLOW AROUND DAM.

SLOPE (FT/FT)	L (FT)
0.020	100
0.030	66
0.040	50
0.050	40
0.060	25
0.100	20
0.120	17
0.150	13

**STONE CHECK DAM DETAIL**

NTS

**RAYMOND SOLAR**

Raymond, Maine

**BLUEWAVE**

**bri**

BIODIVERSITY RESEARCH INSTITUTE

**KREBS & LANSING**  
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Colchester, Vermont 05446  
P: (802) 878-0375  
www.krebsandlansing.com

**BH2M**

Berry, Hugh, McDonald, Milligan Inc.  
Engineers, Surveyors

380B Main Street  
Gorham, Maine 04038  
Tel: (207) 839-2771  
www.bh2m.com

**ISSUED FOR PERMITTING  
NOT FOR CONSTRUCTION**

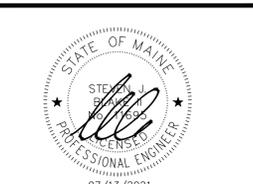
**SOURCE DATA LEGEND**

MAPPING SOURCE DATA USED FOR PLAN COMPILATION

Civil Engineering:  
Krebs and Lansing Consulting Engineers, Inc.  
164 Main Street, Suite 201  
Colchester, Vermont 05446

Environmental:  
Boyle Associates  
254 Commercial Street  
Merrill's Wharf, Suite 101  
Portland, ME 04101

Stormwater:  
BH2M Inc.  
380B Main Street  
Gorham, ME 04038



REV. NO.	REVISIONS/COMMENTS	DATE

DRAWING TITLE:

**RAYMOND SOLAR  
EROSION AND SEDIMENTATION  
CONTROL DETAILS**

DATE of Issue: 07/13/2021

Drawn by: CRM Checked by: SJB

Project No.: 21075 Scale: N/A

Drawing No.: Rev No.:

**C-5.0**

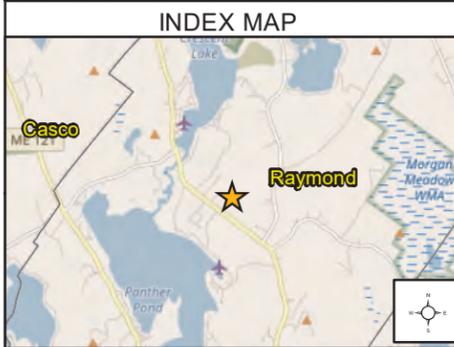
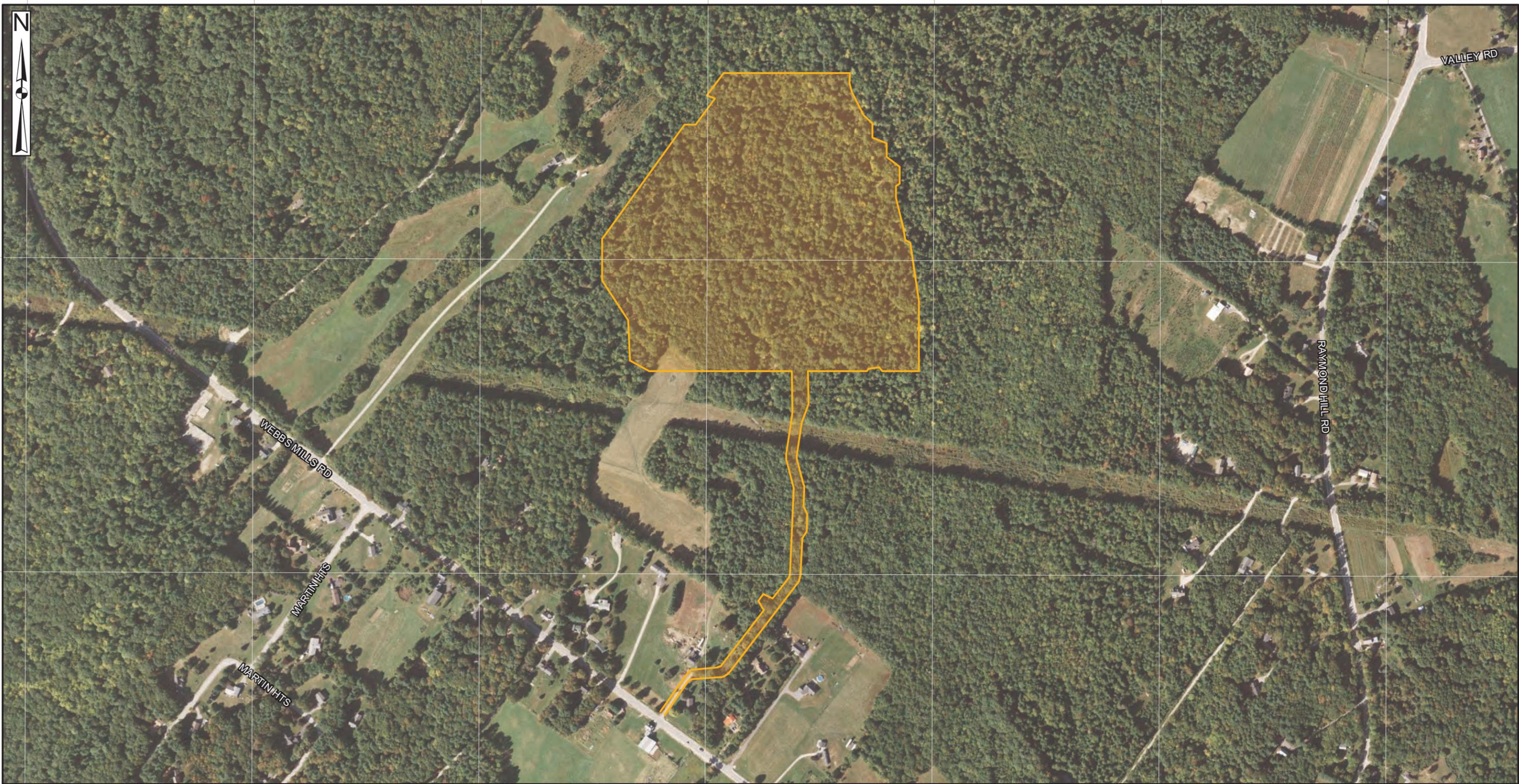


# EXHIBIT D

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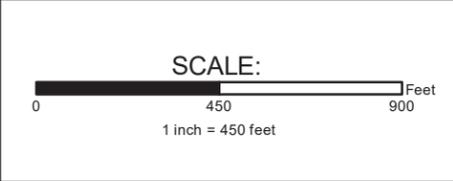
## Maps

70.4625° W 70.4583° W 70.4542° W 70.45° W 70.4458° W 70.4417° W 70.4375° W



**LEGEND**

- Project Limit of Disturbance
- ★ Project Location



# BLUEWAVE

**EXHIBIT D-1:  
PROJECT LOCATION MAP- AERIAL IMAGERY  
RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

JULY 13, 2021

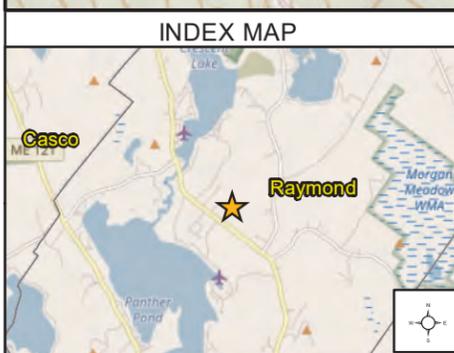
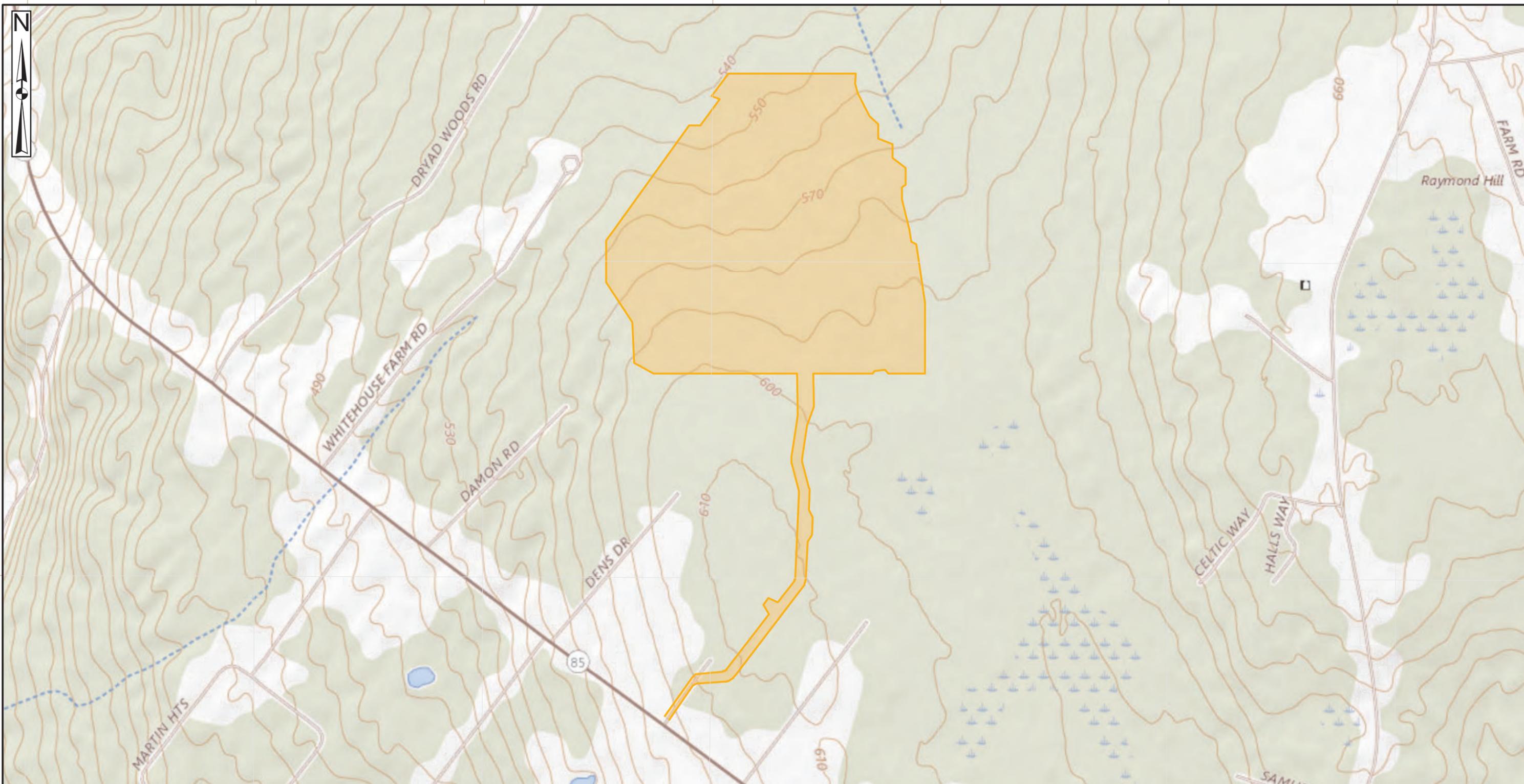
43.9458° N

43.9417° N

43.9458° N

43.9417° N

70.4625° W 70.4583° W 70.4542° W 70.45° W 70.4458° W 70.4417° W 70.4375° W

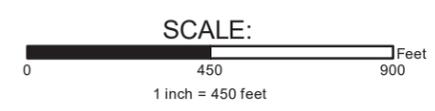


**LEGEND**

- Project Limit of Disturbance
- ★ Project Location



# BLUEWAVE

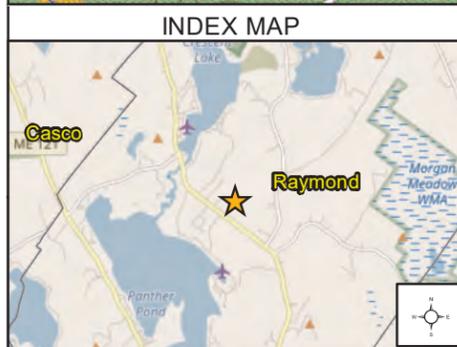
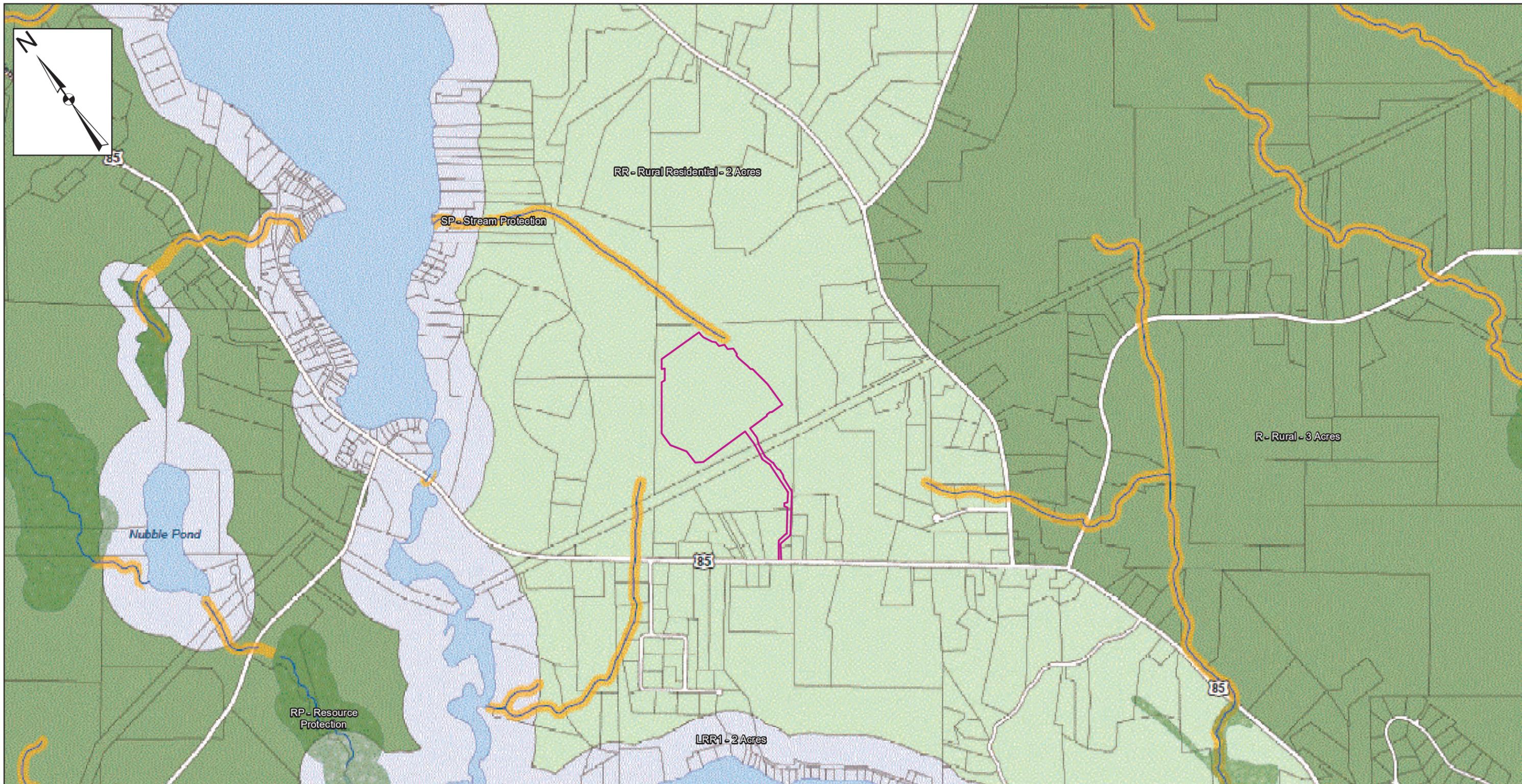


**EXHIBIT D-2:  
PROJECT LOCATION MAP- USGS TOPOGRAPHY  
RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

JULY 13, 2021

43.9458° N  
43.9417° N

43.9458° N  
43.9417° N



**LEGEND**

	Project Limit of Disturbance		RP - Resource Protection
	R - Rural - 3 Acres		SP - Stream Protection
	RR - Rural Residential - 2 Acres		
	LRR1 - 2 Acres		



**SCALE:**

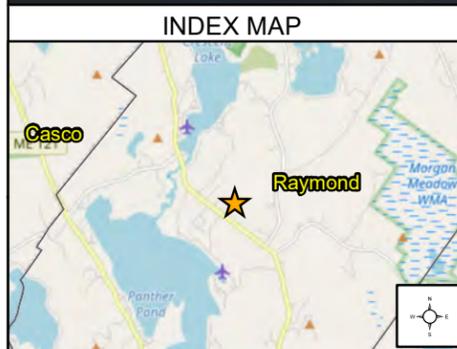
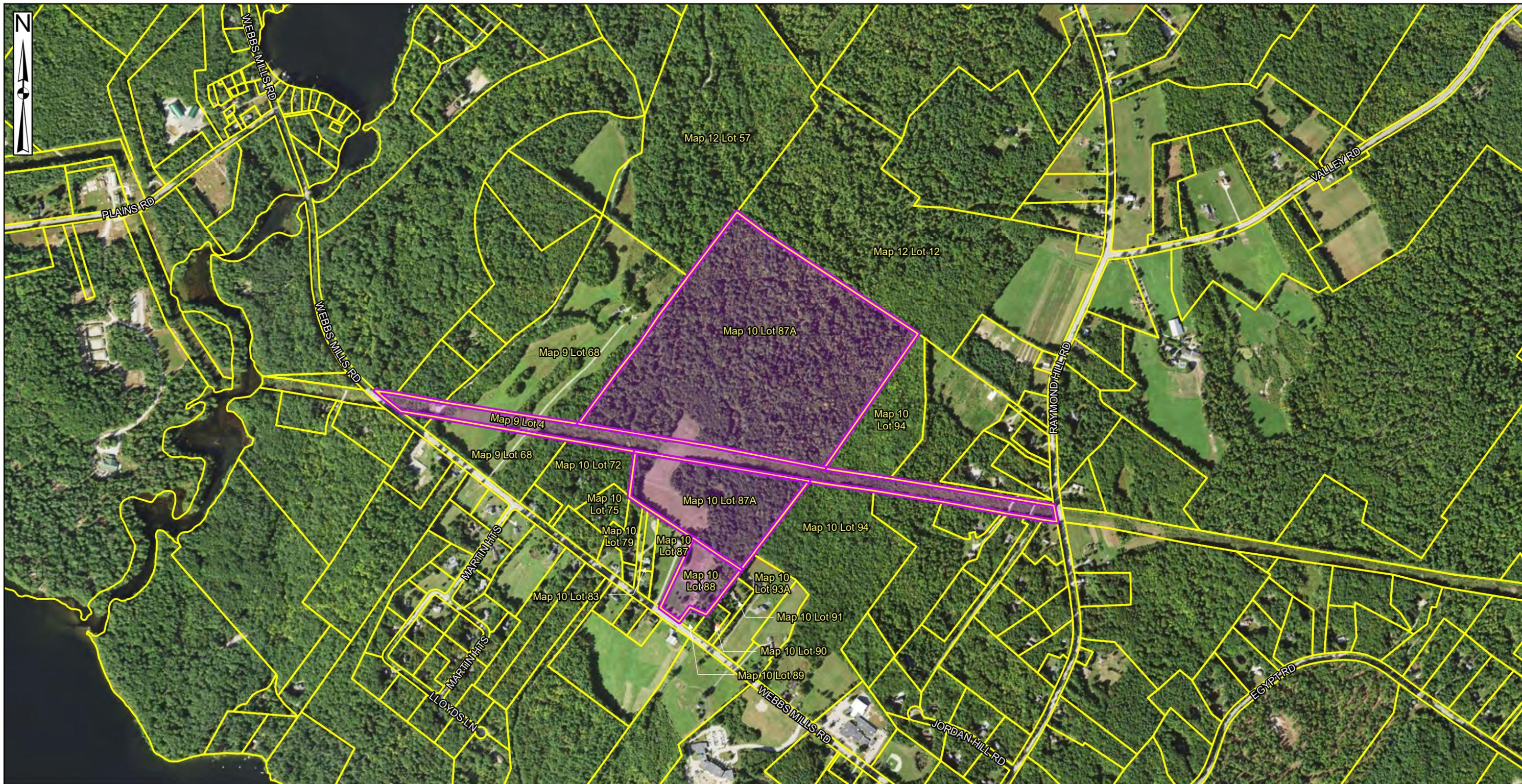
0 1,250 2,500 Feet

1 inch = 1,250 feet

**BLUEWAVE**

**EXHIBIT D-3:**  
**TOWN OF RAYMOND ZONING MAP**  
**RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

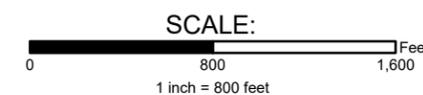
JULY 13, 2021



- LEGEND**
- Project Parcel
  - Parcels



**BLUEWAVE**



**EXHIBIT D-4: TOWN OF RAYMOND TAX MAP  
RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

July 2, 2021

**NOTES CORRESPONDING TO SCHEDULE "B"  
SECTION II EXCEPTIONS**

- NOTE...1 AS USED HEREIN RECORDED SHALL MEAN RECORDED WITH THE CUMBERLAND COUNTY REGISTRY OF DEEDS.  
NOTE...2 AS USED HEREIN SUBJECT PREMISES SHALL MEAN SURVEYED PARCELS SHOWN ON THIS PLAN.
1. Rights, facts, interests or claims of present tenants, lessees or parties in possession which are not shown by the Public Records, but which could be ascertained by an inspection of said Land or by making an inquiry of persons in possession thereof.
  2. Notwithstanding coverage provisions to the contrary contained in the policy or policies to be issued, any encroachment, encumbrance, violation, variation, or adverse circumstances affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
  3. And lien or right of a lien, for services, labor, or material heretofore or hereafter furnished, imposed by law and not shown by the Public Records.
  4. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I - Requirements are met.
  5. Real estate taxes and assessments, and water and sewer charges which become due and payable subsequent to the date of policy. Taxes are paid through TBD.
  6. IF THE LAND IS A CONDOMINIUM UNIT: Covenants, conditions, restrictions, reservations, easements, liens for assessments, options, powers of attorney, and limitations on title, created by the laws of the State of Maine or set forth in the Master Deed or Declaration of Condominium, in the related By-laws, or in the Declaration of Trust, or Site Plans and Floor Plans as duly recorded in the appropriate Public Records and as the same may have been lawfully amended, and in any instrument creating the estate or interest insured by this policy, loss or damage arising as a result of liens for common charges and owners' fees in the enforcement of any lien for said charge. - DEES NOT APPLY.
  7. Any exception, reservation, restriction, easement or condition set out in the attached Exhibit A. AS SHOWN ON PLAN.
  8. Exact acreage or square footage of the Land is not insured. - NOT SURVEY RELATED.
  9. Title to and rights of the public and others entitled thereto in and to those portions of the insured premises lying within the bounds of adjacent streets, roads and ways. - AS SHOWN ON PLAN.
  10. Unrecorded survey entitled "Standard Boundary Survey Plan of Land on Route 85 in Raymond, Maine for Estate of Avis A. Cole", prepared by Daniel T.C. LaPoint, RLS, dated 5/20/91. - AS SHOWN ON PLAN.
  11. Excepting from the above-described parcel a 150' wide strip of land previously conveyed to Central Maine Power Company by deed of William D. Cole dated August 13, 1968, recorded in the Cumberland County Registry of Deeds at Book 3053, Page 55. - AS SHOWN ON PLAN.
  12. Easement to Central Maine Power Company dated November 26, 1947, recorded at Book 1899, Page 397. - POLE NUMBERS REFERENCED IN DEED WERE NOT FOUND ON SUBJECT PREMISES. EXCEPTION DOES NOT APPEAR TO AFFECT SUBJECT PREMISES.
  13. Subject to the rights to maintain a waterline across the above-described parcel to the land now or formerly of Rand, formerly of Whitehouse.

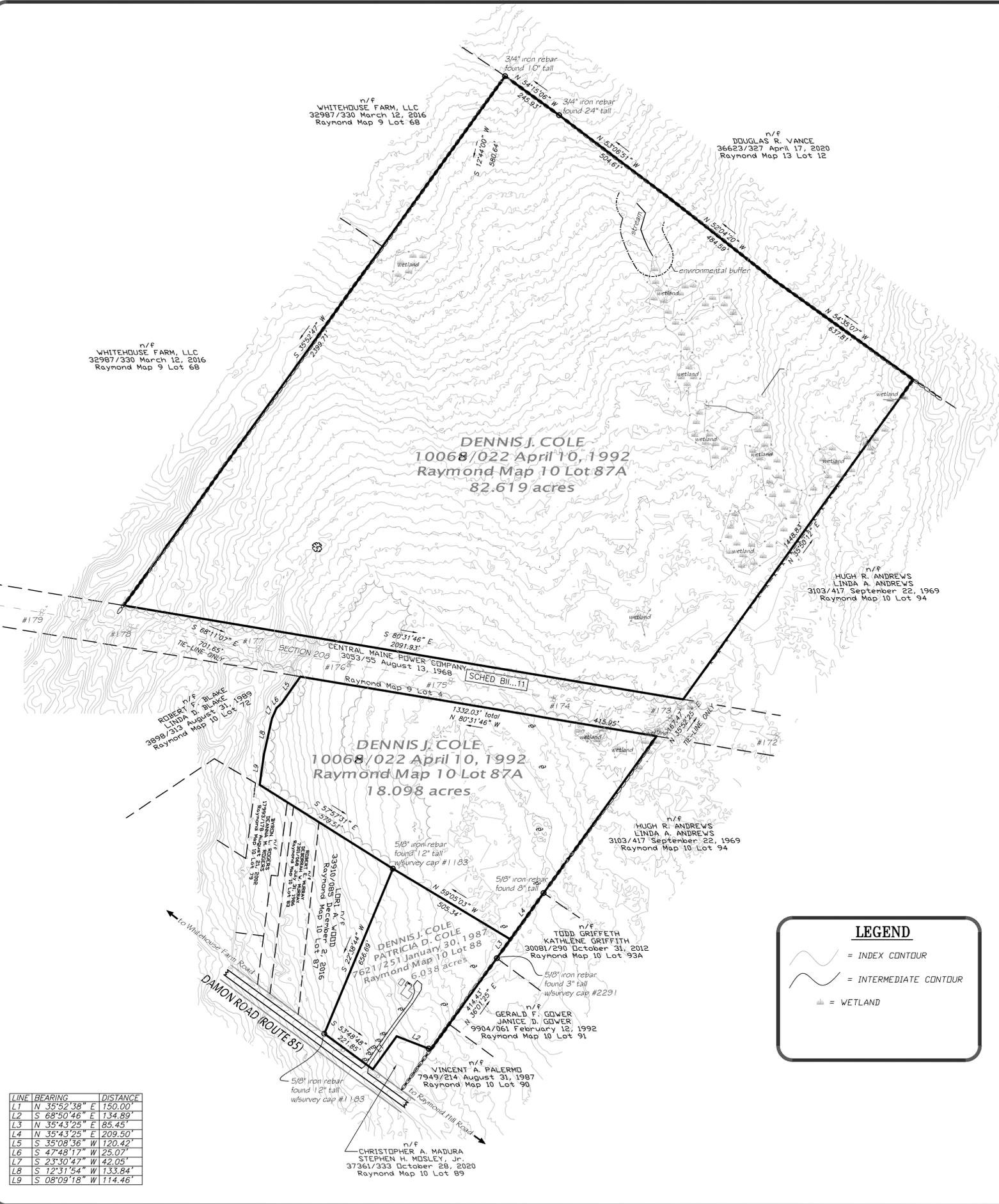
**FLOOD ZONE INFORMATION**

THE ENTIRETY OF THE SUBJECT PARCEL IS LOCATED WITHIN ZONE C AS SHOWN ON FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP TOWN OF RAYMOND, MAINE, CUMBERLAND COUNTY COMMUNITY-PANEL NUMBER 230205 0015 B HAVING AN EFFECTIVE DATE OF MAY 5, 1981

**BASIS OF BEARINGS**

MAINE STATE PLANE COORDINATE SYSTEM  
WEST ZONE - NAD83

**SUBJECT PARCEL LOCATION**



LINE	BEARING	DISTANCE
L1	N 35°52'38" E	150.00'
L2	S 68°50'46" E	134.89'
L3	N 35°43'25" E	85.45'
L4	N 35°43'25" E	209.50'
L5	S 35°08'36" W	120.42'
L6	S 47°48'17" W	25.07'
L7	S 23°30'47" W	42.05'
L8	S 12°31'54" W	133.84'
L9	S 08°09'18" W	114.46'

**LEGEND**

- = INDEX CONTOUR
- = INTERMEDIATE CONTOUR
- = WETLAND

**LEGAL DESCRIPTIONS**

Book 14569 Page 151

A certain lot or parcel of land in Raymond, Cumberland County, Maine conveyed to Dennis J. Cole by deed of Stephanie C. Bubier, Personal Representative of the Estate of Avis A. Cole, dated April 10, 1992, recorded in the Cumberland County Registry of Deeds at Book 10069, Page 22, more particularly bounded and described as follows:

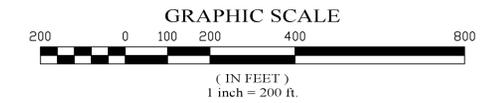
A certain lot or parcel of land situated on the northerly side of Route 85 in the Town of Raymond, Cumberland County, Maine, being more particularly bounded and described as follows:

Beginning at a point marked by an iron set in a stone wall at the northeasterly corner of land now or formerly of Dennis J. Cole and Patricia D. Cole;  
Thence N 43° 09' 42" W, along the land of said Cole, marked in part by a stone wall, 504.4' to a point in said stone wall near a large rock at the land now or formerly of Stephanie C. Bubier;  
Thence N 42° 52' 00" W, continuing along said stone wall and the land of said Bubier, 321.24' to a point in said stone wall at the land now or formerly of R. Murray;  
Thence continuing on the same course of N 42° 52' 00" W, along the land of said Murray, 250.63' to a corner in said stone wall;  
Thence in a northeasterly direction by a meandering stone wall, 440' more or less to an iron found in said wall on the southerly line of land of Central Maine Power Company right of way;  
Thence N 49° 57' 34" E, along the remains of said stone wall and across the land of said Central Maine Power, 166.23' to a point in said stone wall on the northerly sideline of said Central Maine Power right of way;  
Thence N 65° 16' 08" W, along the northerly sideline of said Central Maine Power right of way, 753.87' to a point in a stone wall at the land now or formerly of Priscilla and William Rand;  
Thence N 51° E, along said stone wall and land of said Rand, 2,398' to an iron found at the intersection of 3 stone walls;  
Thence S 39° 02' 45" E, continuing along said stone wall and land of said Rand, 245.84' to an iron found at the intersection of 2 walls at the land now or formerly of Strout;  
Thence S 38° 05' 55" E, continuing along said stone wall and along the land of said Strout, 1625.3' to the intersection of 2 walls at the land now or formerly of H. Andrews (as described in deed recorded at said Registry in Book 3103, Page 417);  
Thence S 51° W, along the land of said Andrews, marked in part by a stone wall and wire fence remnants, 2325.5' to an iron rod found at the intersection of 2 stone walls at the land now or formerly of T. Thorpe (as described in deed recorded at said Registry in Book 8884, Page 202);  
Thence continuing S 51° 06' 07" W, along said stone wall and land of said Thorpe, 215.48' to the iron rod set at the northeasterly corner of land of Dennis J. and Patricia D. Cole to the point of beginning.

The above-described lot as depicted on an unrecorded survey entitled "Standard Boundary Survey Plan of Land on Route 85 in Raymond, Maine for Estate of Avis A. Cole", prepared by Daniel T.C. LaPoint, RLS, dated 5/20/91.

Excepting from the above-described parcel a 150' wide strip of land previously conveyed to Central Maine Power Company.

This conveyance is subject to the rights to maintain a waterline across the above-described parcel to the land now or formerly of Rand, formerly of Whitehouse



**SHEET TITLE**

ALTA/NSPS LAND TITLE SURVEY

**PROJECT**

BH2M  
DAMON ROAD  
RAYMOND, MAINE 04071

**SURVEYED BY:**



DRAWN BY: K.SARGENT  
CHECKED BY: K.SARGENT

**PROJECT NUMBER**

2020269

**SHEET**

1 OF 1

DATED: DECEMBER 12, 2019

**ALTA/ACSM LAND TITLE SURVEY**

SURVEYOR'S CERTIFICATE:

To, FIRST AMERICAN TITLE INSURANCE COMPANY AND  
BH2M:

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2016 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes NO Items of Table A, thereof. The field work was completed on DECEMBER 9, 2019

THIS SURVEY CONFORMS WITH THE RULES ADOPTED BY THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS (April 1, 2001) WITH ANY EXCEPTION TAKEN TO CHAPTER 90, PART 2, 32 MRSA §13903(2)

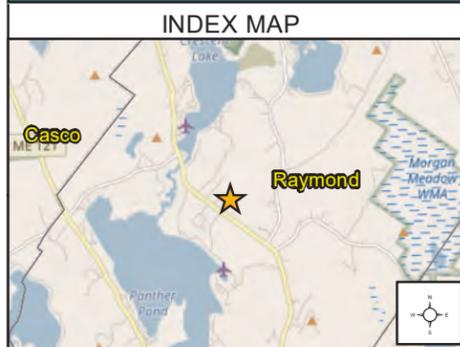
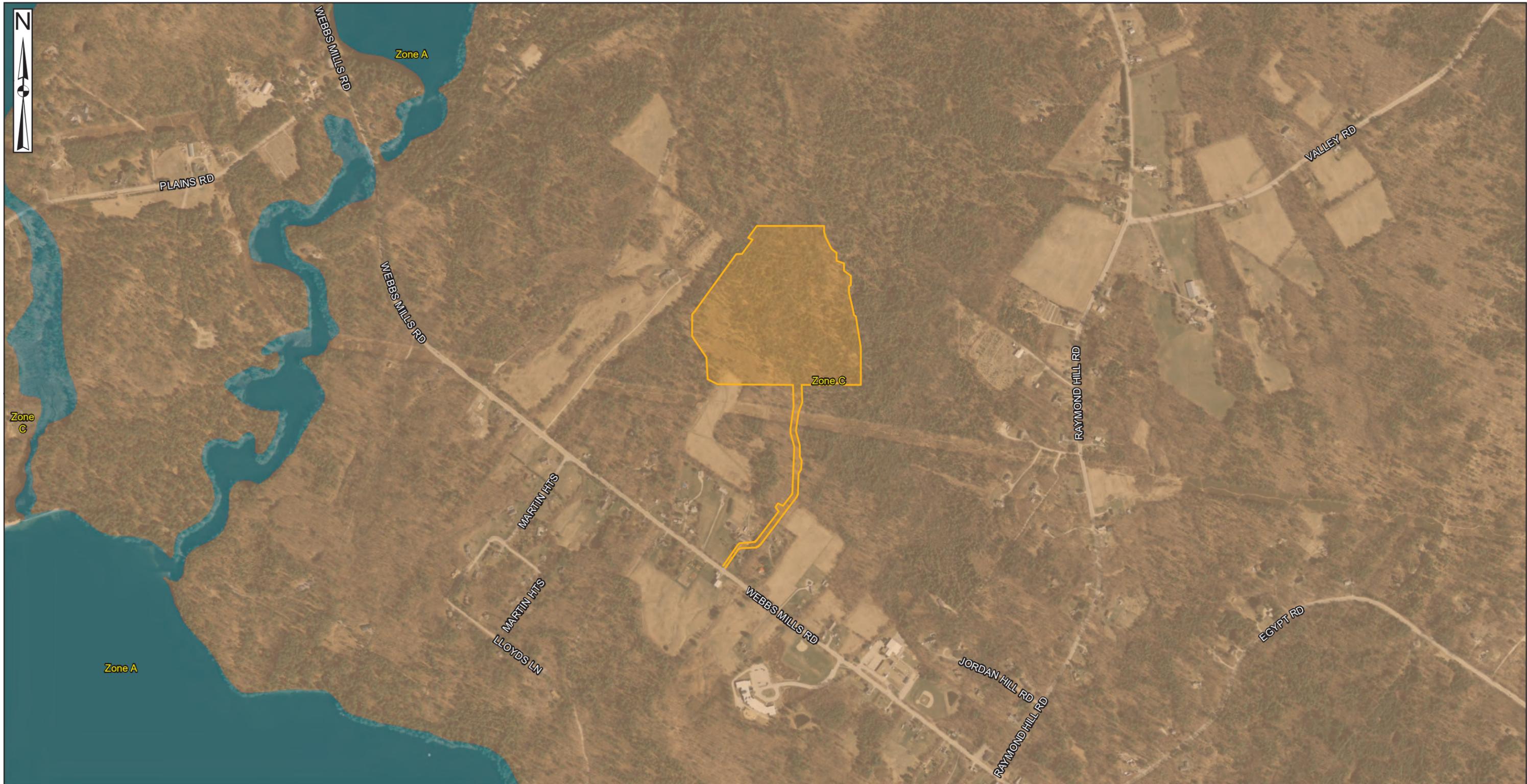
(Technical Standards) NOTED HEREON.

1. NO WRITTEN REPORT PREPARED AT THIS TIME.

KEVIN A. SARGENT  
MAINE PLS 2450

NO. DATE REVISION

1.		
2.		
3.		
4.		
5.		



**LEGEND**

- Project Limit of Disturbance
- Flood Zone**
- Zone A - 1% Annual Flood Risk
- Zone C - Area of Minimal Flood Hazard
- Project Location

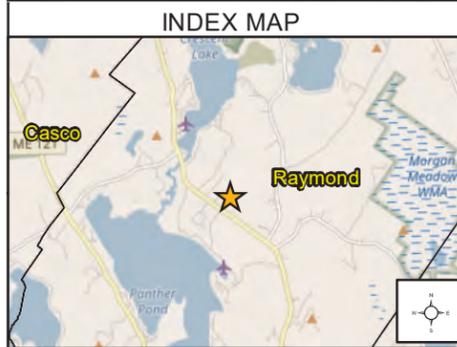
Special Flood Hazard Areas Inundated by 100-Year Flood.  
No base flood elevation determined. Data Derived from FEMA MSC



**BLUEWAVE**

**EXHIBIT D-6:  
FEMA 100 YEAR FLOOD MAP  
RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

JULY 13, 2021

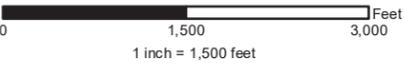


**LEGEND**

-  Project Limit of Disturbance
-  Surficial deposits with moderate to good potential ground-water yield; yields generally greater than 10 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy till and alluvium; yields may exceed 50 gallons per minute in deposits hydraulically connected with surface-water bodies, or in extensive deposits where subsurface data are available.
-  Project Location



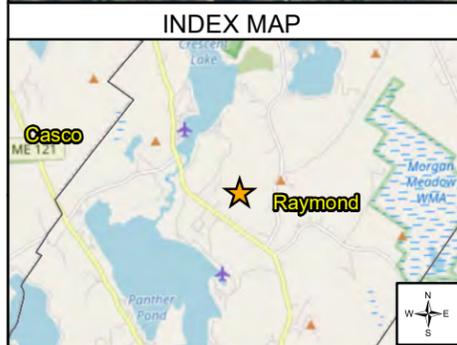
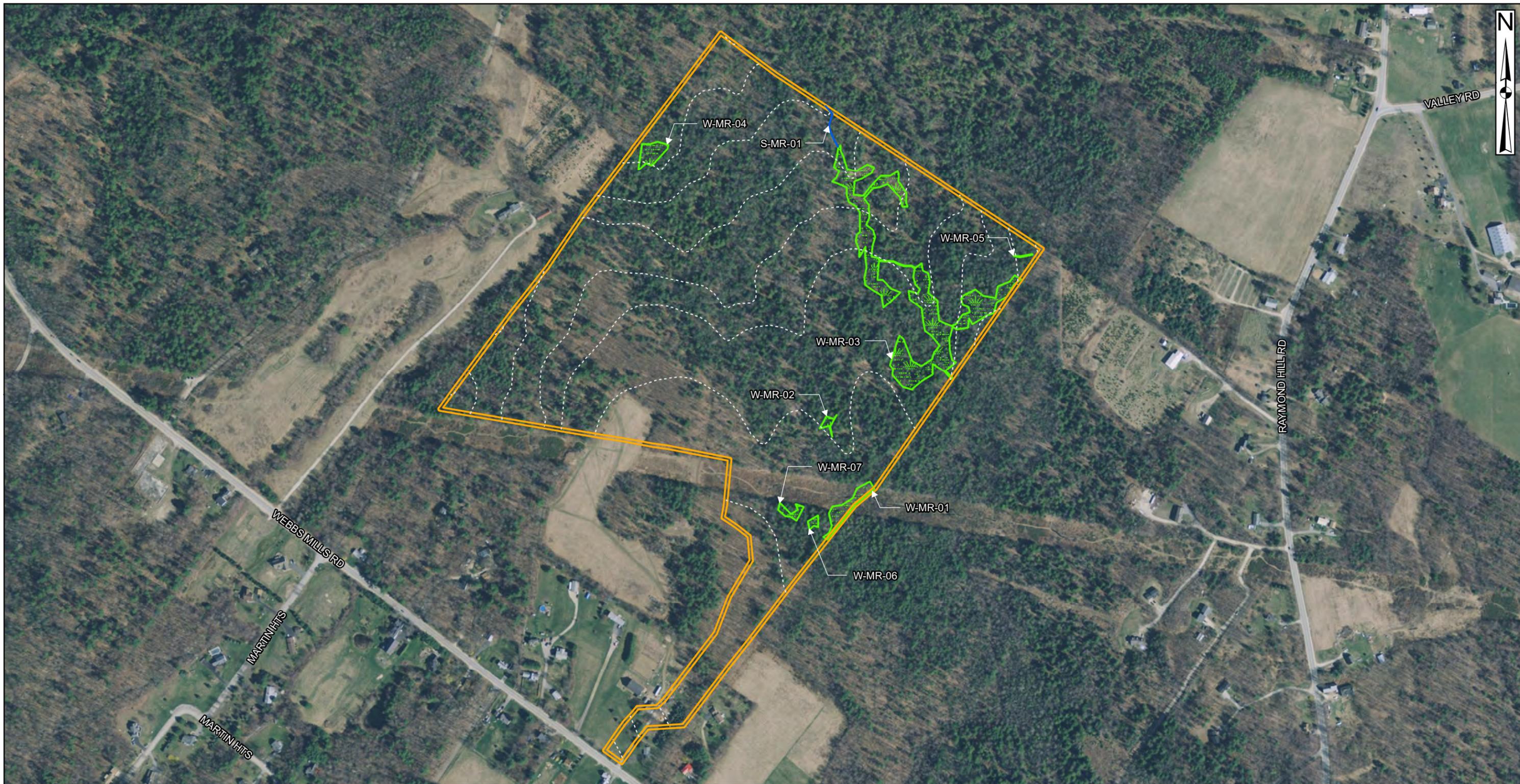
**SCALE:**



**BLUEWAVE**

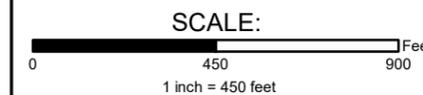
**EXHIBIT D-7: MAINE GEOLOGICAL SURVEY  
SIGNIFICANT SAND & GRAVEL AQUIFERS MAP  
RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

JULY 13, 2021



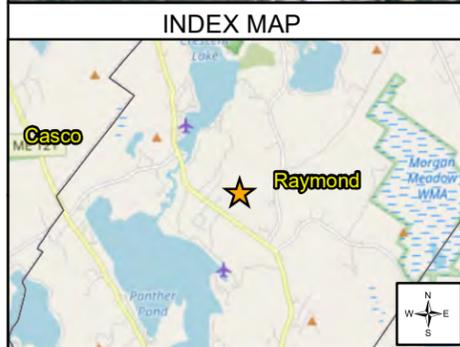
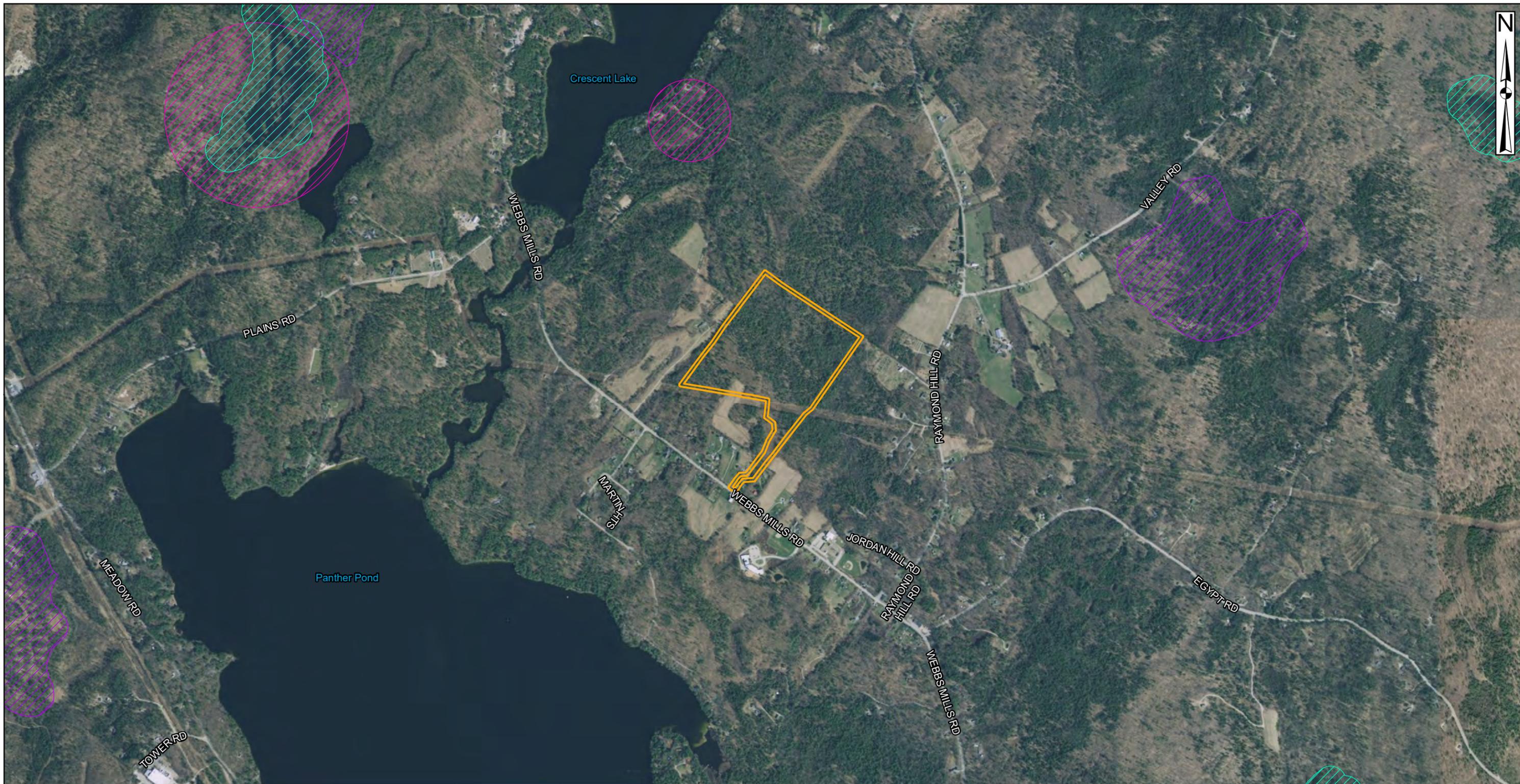
- LEGEND**
- ★ Project Location
  -  Wetlands
  -  Streams
  -  10ft Contour Intervals
  -  Natural Resources Survey Boundary

# BLUEWAVE



**EXHIBIT D-8: NATURAL RESOURCES MAP  
RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

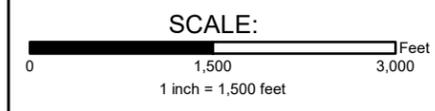
JUNE 29, 2021



- LEGEND** ★ Project Location
- Project Survey Boundary
  - Maine Deer Wintering Areas
  - Inland Waterfowl and Wading Bird Habitat
  - Endangered Threatened and Special Concern Wildlife Habitat

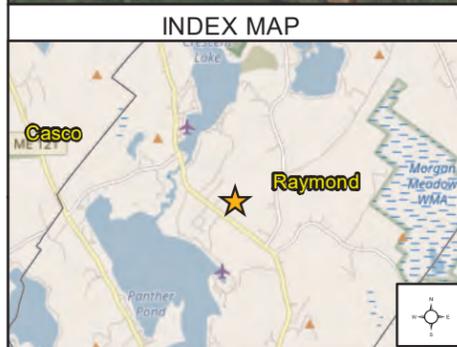


**BLUEWAVE**



**EXHIBIT D-9: SIGNIFICANT WILDLIFE HABITAT MAP  
RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

**JUNE 29, 2021**



**LEGEND**

- Project Limit of Disturbance
- - - Snowmobile Trail

**SCALE:**

0 450 900 Feet

1 inch = 450 feet

**BLUEWAVE**

**EXHIBIT D-10:  
SNOWMOBILE TRAIL  
RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

JULY 13, 2021

**EXHIBIT E**

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**Abutters List**

## RAYMOND SOLAR PROJECT

### List of Abutters

PARCEL NUMBER (MAP-BLOCK-LOT)	PROPERTY ADDRESS	OWNER NAME	OWNER ADDRESS	OWNER CITY/TOWN	OWNER STATE & ZIP CODE
0010-0094	435 WEBBS MILLS RD RAYMOND ME, 04071	HUGH R & LINDA A ANDREWS	435 WEBBS MILLS RD	RAYMOND	ME, 04071
0010-0093-A	451 WEBBS MILLS RD RAYMOND ME, 04071	TODD GRIFFETH	451 WEBBS MILLS RD	RAYMOND	ME, 04071
0010-0091	9 OX VIEW LANE RAYMOND ME, 04071	GERALD F & JANICE D GOWER	9 OX VIEW LANE	RAYMOND	ME, 04071
0010-0090	4 OX VIEW LANE RAYMOND ME, 04071	VINCENT A PALERMO	4 OX VIEW LANE	RAYMOND	ME, 04071
0010-0089	1 DEN'S RD RAYMOND ME, 04071	MICHAEL D'ARCANGELO	82 DAGGET DR	RAYMOND	ME, 04071
0010-0087	463 WEBBS MILLS RD RAYMOND ME, 04071	ANDREW M & CAROL JORDAN	179 WEBBS MILLS RD	RAYMOND	ME, 04071
0010-0083	5 DAMON RD RAYMOND ME, 04071	ROBERT E & DEBORRAH MURRAY	5 DAMON RD	RAYMOND	ME, 04071
0010-0079	8 DAMON RD RAYMOND ME, 04071	AMANDA A LEAVITT & CHRISTOPHER D TEAS	8 DAMON RD	RAYMOND	ME, 04071
0010-0075	483 WEBBS MILLS RD RAYMOND ME, 04071	PHILIP C BLAKE & KATHRYN O'NEIL-BLAKE	483 WEBBS MILLS RD	RAYMOND	ME, 04071
0010-0035	460 WEBBS MILLS RD RAYMOND ME, 04071	LAWRENCE C MURCH	460 WEBBS MILLS RD	RAYMOND	ME, 04071
0010-0072	485 WEBBS MILLS RD RAYMOND ME, 04071	ROBERT F & LINDA BLAKE	485 WEBBS MILLS RD	RAYMOND	ME, 04071
0010-0036	464 WEBBS MILLS RD RAYMOND ME, 04071	EARLE SPAULDING	464 WEBBS MILLS RD	RAYMOND	ME, 04071
0009-0068	505 WEBBS MILLS RD RAYMOND ME, 04071	WHITEHOUSE FARM LLC C/O JOHN B RAND	20 DRYAD WOODS ROAD	RAYMOND	ME, 04071

0009-0004	522 WEBBS MILLS RD RAYMOND ME, 04071	CENTRAL MAINE POWER CO C/O AVANGRID MANAGEMENT COMPANY	ONE CITY CENTER 5TH FLOOR	PORTLAND	ME, 04101
0012-0057	0 DRYAD WOODS RD RAYMOND ME, 04071	WHITEHOUSE FARM LLC C/O JOHN B RAND	20 DRYAD WOODS RD	RAYMOND	ME, 04071
0013-0012	RAYMOND HILL RD RAYMOND ME, 04071	DOUGLAS R VANCE PERSONAL REPRESENTATIVE	398 WEBBS MILLS RD	RAYMOND	ME, 04071

**EXHIBIT F**

---

**Agency Consultation**



**STATE OF MAINE**  
**DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY**

177 STATE HOUSE STATION  
AUGUSTA, MAINE 04333

**JANET T. MILLS**  
GOVERNOR

**AMANDA E. BEAL**  
COMMISSIONER

October 19, 2020

Steve Knapp  
Boyle Associates  
254 Commercial Street  
Merrill's Wharf, Suite 101  
Portland, ME 04101

Via email: [sknapp@boyleassociates.net](mailto:sknapp@boyleassociates.net)

Re: Rare and exemplary botanical features in proximity to: #684, Potential Blue Wave Solar Project, Webbs Mills Road, Raymond, Maine

Dear Mr. Knapp:

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files in response to your request received October 9, 2020 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Raymond, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

**MOLLY DOCHERTY, DIRECTOR**  
MAINE NATURAL AREAS PROGRAM  
BLOSSOM LANE, DEERING BUILDING



PHONE: (207) 287-804490  
WWW.MAINE.GOV/DACF/MNAP

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

The Maine Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$150.00 for two hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

A handwritten signature in cursive script, appearing to read "Kristen Puryear".

Kristen Puryear | Ecologist | Maine Natural Areas Program  
207-287-8043 | [kristen.puryear@maine.gov](mailto:kristen.puryear@maine.gov)

## Rare and Exemplary Botanical Features within 4 miles of Project: #684, Potential Blue Wave Solar Project, Webbs Mills Road, Raymond, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Broad Beech Fern						
	SC	S2	G5	1895-09	13	Hardwood to mixed forest (forest, upland)
Dry Land Sedge						
	SC	S2	G5	2001-06-08	8	Old field/roadside (non-forested, wetland or upland)
Enriched Northern Hardwoods Forest						
	<null>	S3	GNR	2001-06-08	33	Hardwood to mixed forest (forest, upland)
Fern-leaved False Foxglove						
	SC	S3	G5	2017-06-15	28	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
	SC	S3	G5	1893-08-28	14	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
	SC	S3	G5	1895	12	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
	SC	S3	G5	2001-06-08	25	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
Large Whorled Pogonia						
	PE	SX	G5	1895	2	Hardwood to mixed forest (forest, upland)
Oak - Pine Forest						
	<null>	S5	G5	2005-06-21	5	Hardwood to mixed forest (forest, upland)
Oak - Pine Woodland						
	<null>	S4	G3G5	2001-06-08	10	Dry barrens (partly forested, upland),Rocky summits and outcrops (non-forested, upland)
Purple Clematis						
	SC	S3	G5T5	2001-06-08	26	Non-tidal rivershore (non-forested, seasonally wet),Hardwood to mixed forest (forest, upland)
Ram's-head Lady's-slipper						
	E	S1	G3	1935	11	Forested wetland,Hardwood to mixed forest (forest, upland)

Rare and Exemplary Botanical Features within 4 miles of  
 Project: #684, Potential Blue Wave Solar Project, Webbs Mills Road, Raymond, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Scarlet Oak						
	E	S1	G5	1893	1	Hardwood to mixed forest (forest, upland)
Summer Grape						
	T	S2	G5T5	2001-06-08	8	Hardwood to mixed forest (forest, upland), Rocky summits and outcrops (non-forested, upland)
	T	S2	G5T5	2017-06-15	7	Hardwood to mixed forest (forest, upland), Rocky summits and outcrops (non-forested, upland)
Tiny Lovegrass						
	PE	SH	G5	1908-11	5	Old field/roadside (non-forested, wetland or upland), Dry barrens (partly forested, upland)
Upright Bindweed						
	T	S2	G4G5	1958-06-22	10	Dry barrens (partly forested, upland), Old field/roadside (non-forested, wetland or upland)
Vasey's Pondweed						
	SC	S2	G4	1800	6	Open water (non-forested, wetland)

## STATE RARITY RANKS

- S1** Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- S2** Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- S3** Rare in Maine (20-100 occurrences).
- S4** Apparently secure in Maine.
- S5** Demonstrably secure in Maine.
- SU** Under consideration for assigning rarity status; more information needed on threats or distribution.
- SNR** Not yet ranked.
- SNA** Rank not applicable.
- S#?** Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

**Note:** **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

## GLOBAL RARITY RANKS

- G1** Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
- G2** Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3** Globally rare (20-100 occurrences).
- G4** Apparently secure globally.
- G5** Demonstrably secure globally.
- GNR** Not yet ranked.

**Note:** **Global Ranks** are determined by NatureServe.

## STATE LEGAL STATUS

**Note:** State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered and Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

- E** ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
- T** THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

## NON-LEGAL STATUS

- SC** SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
- PE** Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

## ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size**: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition**: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

**Note:** **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!  
<http://www.maine.gov/dacf/mnap>



MAINE HISTORIC PRESERVATION COMMISSION  
55 CAPITOL STREET  
65 STATE HOUSE STATION  
AUGUSTA, MAINE  
04333

JANET T. MILLS  
GOVERNOR

KIRK F. MOHNEY  
DIRECTOR

March 8, 2021

Mr. Dale F. Knapp  
Boyle Associates  
254 Commercial Street  
Merrill's Wharf, Suite 101  
Portland, ME 04101

Project: MHPC #0354-21      Bluewave Solar; Webbs Mills Road  
Solar Project

Town: Raymond, ME

Dear Mr. Knapp:

In response to your recent request, I have reviewed the information received February 23, 2021 to initiate consultation on the above referenced project in accordance with the requirements of Maine Department of Environmental Protection.

In order to continue our review, please provide a site plan and photographs of any buildings, 50 years or older, located on or adjacent to the proposed project. Please key the photographs to a location map.

We look forward to continuing consultation with you. If you have any questions regarding above-ground properties, please contact Megan M. Rideout of this office at [megan.m.rideout@maine.gov](mailto:megan.m.rideout@maine.gov).

Sincerely,

Kirk F. Mohney  
State Historic Preservation Officer



June 4, 2021

Kirk F. Mohney  
Director and State Historic Preservation Officer  
Maine Historic Preservation Commission  
65 State House Station  
Augusta, Maine 04333-0065

**RE: Raymond Solar Project; MHPC #0354-21  
Raymond, ME; Project Site Review**

Dear Kirk,

Biodiversity Research Institute, Inc. has compiled the following report detailing potential historic structures on or adjacent to the Raymond Solar Project. The project's limit of disturbance is approximately 48 acres and located north-east of State Route 85 / Webbs Mills Road in Raymond, Maine.

This report used Maine Geological Society historic aerial photography to determine the approximate age of nearby structures. One photograph dating from 1964 was especially helpful. No potential historic structures were identified within the project boundary. However, seven potential structures were identified adjacent to the project (**Attachment 1**).

As requested, we have included photographs of the structures, location maps, the project site plan, and a visual review completed by T.J. Boyle Associates. If you have any questions please contact me at [dale.knapp@brienvironmental.org](mailto:dale.knapp@brienvironmental.org) or call 207-631-9134.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "DK", enclosed within a large, sweeping, handwritten loop.

Dale F. Knapp, CSS, LSE, CEP, PWS  
Principal  
BRI Environmental



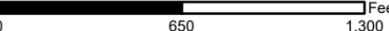
## **Attachment 1: Maine Geological Survey 1964 Aerial Imagery**



**LEGEND**

-  Potential Historic Structures
-  Survey Boundary



SCALE:  
  
 1 inch = 650 feet



**MAINE GEOLOGICAL SURVEY 1964 AERIAL PHOTO  
 RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

JUNE 03, 2021



## Attachment 2: Photo Analysis Location Map



**LEGEND**

-  Potential Historic Structures
-  Photo Location Points
-  Survey Boundary



**BLUEWAVE**



**PHOTO ANALYSIS LOCATION MAP  
RAYMOND SOLAR PROJECT: RAYMOND,  
MAINE**

**JUNE 03, 2021**



## Attachment 3: Site Photographs



**Photo Location 1:** Facing North West from Webbs Mills Rd with view of current structure.



**Photo Location 2-1:** Facing N from Webbs Mills Rd with view of current structures and surrounding area.



**Photo Location 2-2:** Facing NE from Webbs Mills Rd with view of current structures and surrounding area.



**Photo Location 3:** Facing NE from Webbs Mills Rd with view of current lot conditions.



**Photo Location 4-1:** Facing NE with view of current structure.



**Photo Location 4-2:** Facing SE with view of current lot conditions.



**Photo Location 5-1:** Facing SW from Webbs Mills Rd with view of current structure.



**Photo Location 5-2:** Facing W from Webbs Mills Rd with view of current structure and adjacent lot conditions.



**Photo Location 6:** Facing W from Webbs Mills Rd with view of current structure.



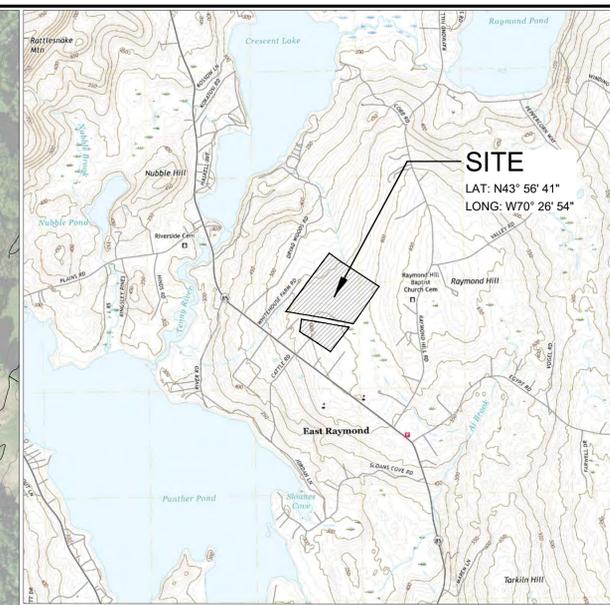
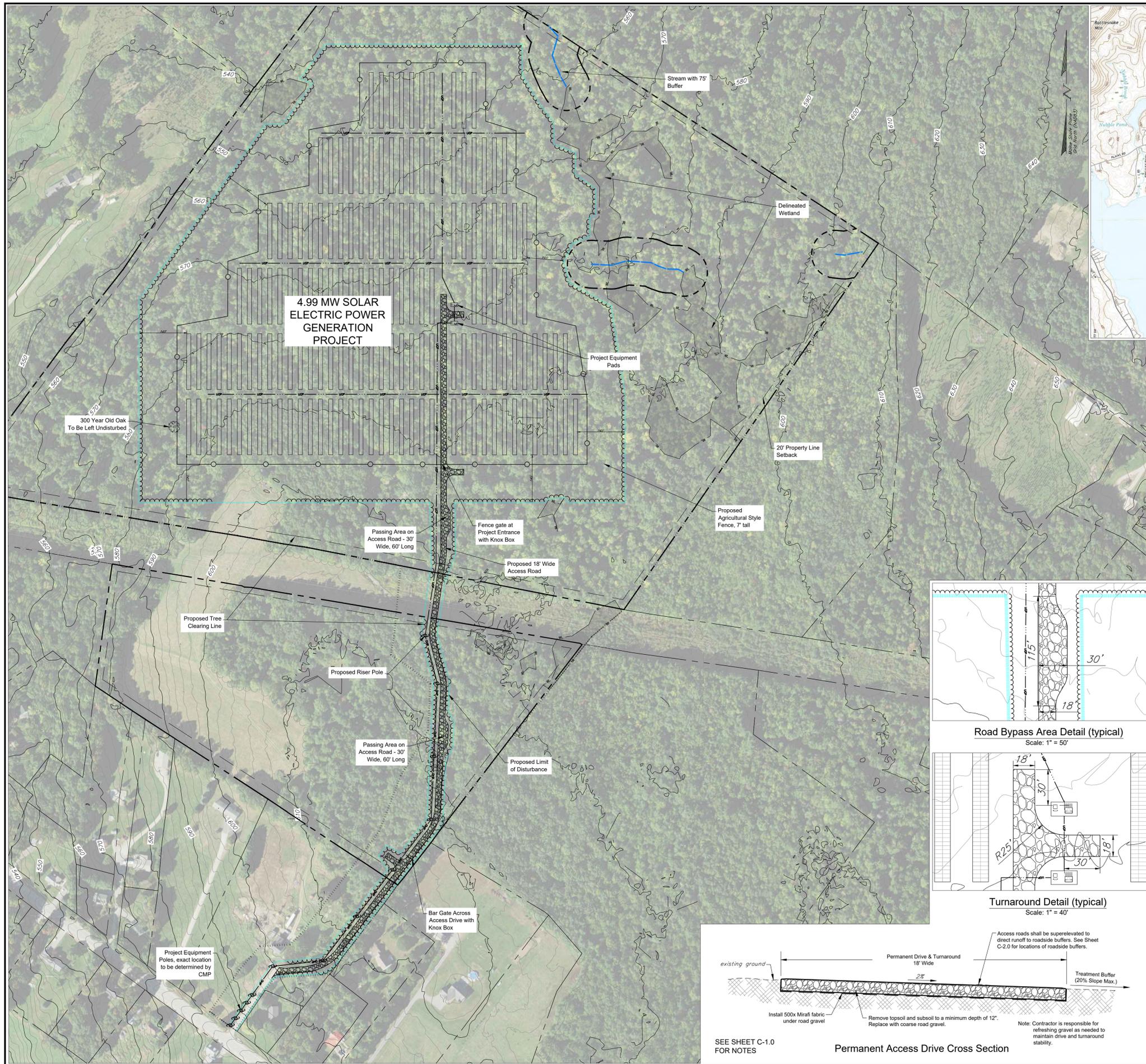
**Photo Location 7-1:** Facing NW with view of current structure.



**Photo Location 7-2:** Facing N with view of current structure and adjacent lot conditions.

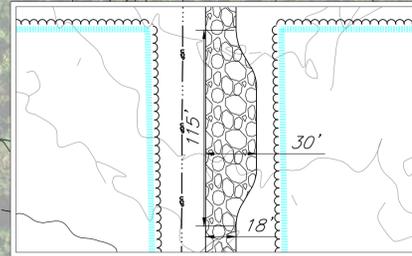


## Attachment 4: Site Plan

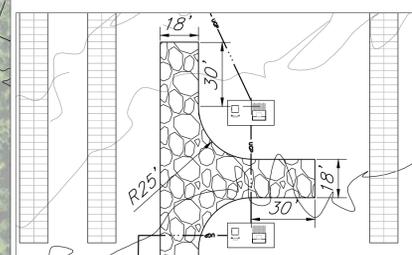


**LOCATION MAP**  
SCALE: 1" = 1/2 Mile

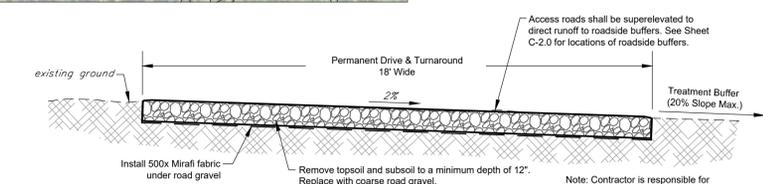
- LEGEND**
- EXISTING POWER POLE / PROPOSED POLE
  - APPROXIMATE PROPERTY LINES
  - - - APPROXIMATE PROJECT PARCEL
  - - - SETBACKS TO SOLAR PANEL RACKING
  - EXISTING GRADE CONTOUR LINES (2 FOOT INTERVALS)
  - PROPOSED GRADE CONTOUR LINES (10 FOOT INTERVALS)
  - PROPOSED GRADE CONTOUR LINES (2 FOOT INTERVALS)
  - EXISTING TREELINE
  - EXISTING OVERHEAD POWER
  - PROPOSED PROJECT FENCE
  - PROPOSED UNDERGROUND POWER
  - PROPOSED OVERHEAD POWER
  - PROPOSED SWITCH GEAR PAD & TRANSFORMER PAD
  - PROPOSED FIXED MOUNT SOLAR PANEL RACKING
  - DELINEATED WETLAND
  - PROPOSED 18" GRAVEL ACCESS DRIVE
  - DELINEATED STREAM
  - ENVIRONMENTAL BUFFER
  - PROPOSED TREELINE
  - PROPOSED LIMIT OF DISTURBANCE
  - ENVIRONMENTAL SURVEY BOUNDARY
  - CONSTRUCTION STAGING AREA



**Road Bypass Area Detail (typical)**  
Scale: 1" = 50'



**Turnaround Detail (typical)**  
Scale: 1" = 40'



**Permanent Access Drive Cross Section**

- NOTES:**
- ASPECTS OF PLAN ARE APPROXIMATE AND DERIVED FROM AERIAL PHOTOGRAPHY.
  - THE HORIZONTAL COORDINATE SYSTEM IS BASED ON NAD83 MAINE STATE PLANES, WEST ZONE (US SURVEY FEET). ELEVATIONS ARE BASED ON THE NAVD88 (US SURVEY FEET).
  - EXISTING GROUND CONTOUR ELEVATIONS ARE BASED ON LIDAR DATA FROM THE MAINE OFFICE OF GIS.
  - UTILITIES ARE NOT WARRANTED TO BE COMPLETE OR ACCURATE. CONTRACTOR SHALL CONTACT DIG SAFE BEFORE BEGINNING ANY EXCAVATION.
  - THIS IS A PRELIMINARY DESIGN PLAN. FINAL DESIGN WILL BE MODIFIED TO MATCH EQUIPMENT PURCHASED AND POSSIBLE PERMIT CONSTRAINTS REVEALED DURING PROJECTS REVIEW.

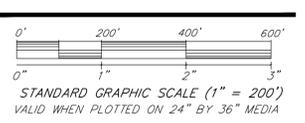
# RAYMOND SOLAR

Raymond, Maine



**ISSUED FOR PERMITTING  
NOT FOR CONSTRUCTION**

**SOURCE DATA LEGEND**  
MAPPING SOURCE DATA USED FOR PLAN COMPILATION  
Civil Engineering:  
Krebs and Lansing Consulting Engineers, Inc.  
164 Main Street, Suite 201  
Colchester, Vermont 05446  
Environmental:  
Boyle Associates  
254 Commercial Street  
Merrill's Wharf, Suite 101  
Portland, ME 04101



**SOLAR ARRAY DESIGN INFORMATION:**  
6.69 MW DC  
4.99 MW AC  
DC/AC = 1.34  
415W PHOTOVOLTAIC MODULES  
16,120 MODULES  
26 MODULES PER STRING  
620 STRINGS  
PITCH = 32.0°  
GCR = 0.418  
LOD = 43.7 ACRES  
CLEARING = 42.4 ACRES  
FENCED AREA = 26.9 ACRES

REV. NO.	REVISIONS/COMMENTS	DATE

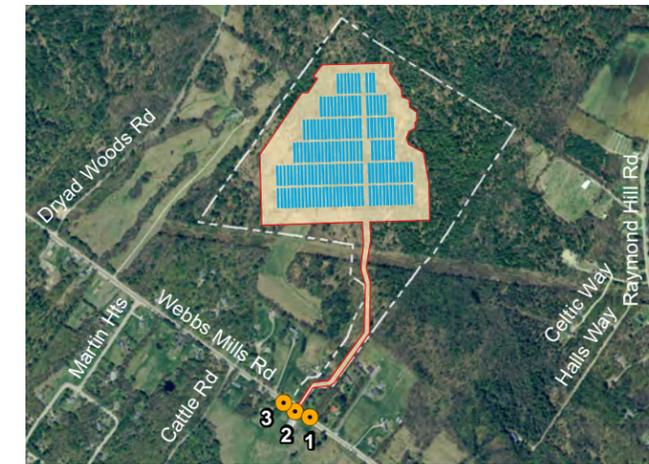
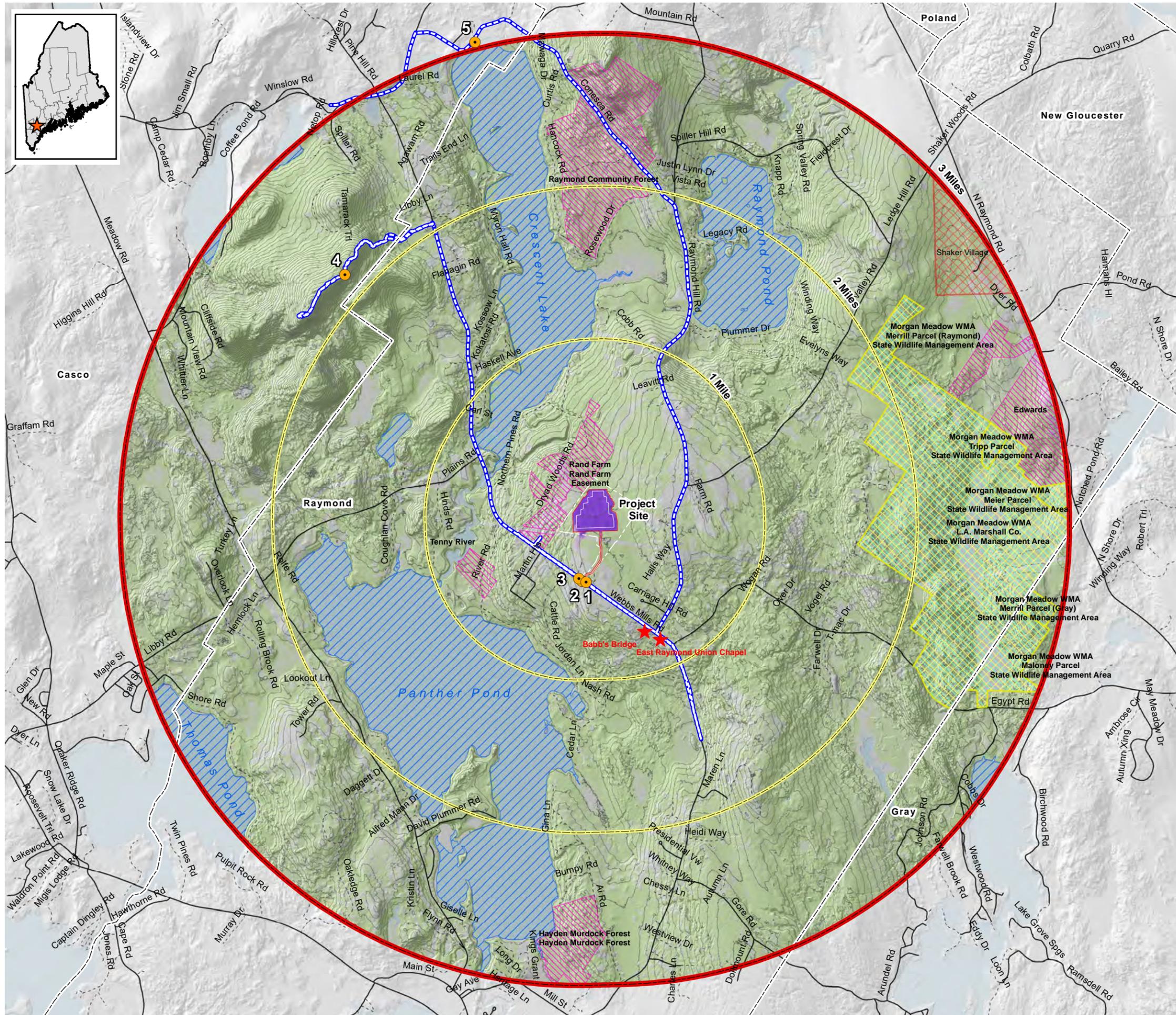
Drawing Title:  
**OVERALL SITE PLAN**

DATE of Issue: 03/26/2021  
Drawn by: EJM Checked by: JAU  
Project No.: 20293 Scale: 1" = 150'  
Drawing No.: Rev No.:

**C-1.0**



## Attachment 5: Visual Review



SITE MAP

# Raymond Solar

## Appendix A

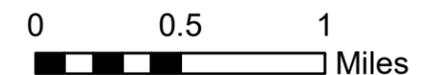
### VEGETATED VIEWSHED & SCENIC RESOURCE MAP

[ 3-Mile Study Area ]

June 2021

#### LEGEND

- Viewpoint Location
- Inventory Route
- National Historic Places
- 1-Mile Radius Rings
- 3-Mile Study Area
- State Conserved Land
- Private Conserved Land
- Maine's Finest Lakes
- National Historic Properties
- Wildlife Management Areas
- Obstructions (Canopy, Buildings)
- Roads
- Private Roads
- Visibility within Non-Forested Areas
  - High Low



GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

Elevation data derived from LiDAR data and/or the National Elevation Dataset.



JANET T. MILLS  
GOVERNOR

MAINE HISTORIC PRESERVATION COMMISSION  
55 CAPITOL STREET  
65 STATE HOUSE STATION  
AUGUSTA, MAINE  
04333

KIRK F. MOHNEY  
DIRECTOR

June 16, 2021

Mr. Dale Knapp  
BRI Environmental  
30 Danforth Street  
Suite 213  
Portland, ME 04101

Project: MHPC #0354-21      Bluewave Solar; Webbs Mills Road  
Solar Project  
Town: Raymond, ME

Dear Mr. Knapp:

In response to your recent request, I have reviewed the information received June 9, 2021 to continue consultation on the above referenced project in accordance with the requirements of Maine Department of Environmental Protection.

Based on the information provided, I have concluded that there are no National Register eligible properties on or adjacent to the parcels. In addition, the project area is not considered sensitive for archaeological resources.

Please contact Megan M. Rideout of our staff, at [megan.m.rideout@maine.gov](mailto:megan.m.rideout@maine.gov) or 207-287-2992, if we can be of further assistance in this matter.

Sincerely,

Kirk F. Mohney  
State Historic Preservation Officer



STATE OF MAINE  
DEPARTMENT OF  
INLAND FISHERIES & WILDLIFE  
284 STATE STREET  
41 STATE HOUSE STATION  
AUGUSTA ME 04333-0041



March 5, 2021

Steve Knapp  
Boyle Associates  
254 Commercial Street, Merrill's Wharf, Suite 101  
Portland, ME 04101

**RE: Information Request – Bluewave Solar Project, Raymond**

Dear Steve:

Per your request received on February 22, 2021, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and inland fisheries habitat concerns within the vicinity of the *Bluewave Solar* project in Raymond. Note that as project details are lacking, and due to the general nature and scale of the map that was provided, our comments are non-specific and should be considered preliminary.

**Please note this document does not fulfill the requirements of the Maine Public Utilities Commission's Distributed Generation Project Siting Attributes for solar energy projects. For solar projects seeking MDIFW's determination of potential impacts to Maine-listed Endangered or Threatened species or habitats pursuant to the MPUC process, please send a separate, clearly labeled request to: [IFWEnvironmentalreview@maine.gov](mailto:IFWEnvironmentalreview@maine.gov) and a separate response will be provided.**

Our Department has not mapped any Essential Habitats that would be directly affected by your project.

***Endangered, Threatened, and Special Concern Species***

Bats - Of the eight species of bats that occur in Maine, the three *Myotis* species are afforded special protection under Maine's Endangered Species Act (MESA, 12 M.R.S §12801 et. seq.): little brown bat (State Endangered), northern long-eared bat (State Endangered), and eastern small-footed bat (State Threatened). The five remaining bat species are designated as Species of Special Concern: big brown bat, red bat, hoary bat, silver-haired bat, and tri-colored bat. While a comprehensive statewide inventory for bats has not been completed, based on historical evidence, it is likely that several of these species occur within the project area during the fall/spring migration, the summer breeding season, and/or for overwintering. If the proposed project has a Federal nexus, either via funding or permitting, or if the project is not consistent with the USFWS "4(d) Rule", we recommend that you contact the U.S. Fish and Wildlife Service--Maine Fish and Wildlife Complex (Wende Mahaney, [Wende\\_Mahaney@fws.gov](mailto:Wende_Mahaney@fws.gov), 207-902-1569) for further guidance on their perspective, as the northern long-eared bat is also listed as a Threatened Species under the Federal Endangered Species Act. The USFWS "4(d) Rule" provides guidance for protection of bat winter hibernacula and maternity roost trees for northern long-eared bats (see <https://www.fws.gov/midwest/endangered/mammals/nleb/4drule.html>). MDIFW Endangered Species Rules for bats (Chapter 8.06; see link at <http://www.maine.gov/sos/cec/rules/09/137/137c008.docx>) provide equivalent seasonal protection of maternity roost trees for any of the three state-listed bats, seasonally prohibits entry into subsurface winter

hibernacula, and has additional protections for tree removal within ¼ mile of subsurface winter hibernacula. At present, no maternity roost trees have been designated for protection.

In addition to traditional hibernacula like caves and old mines, recent findings indicate that *Myotis* and big brown bats may also overwinter in exposed rocky features. To date, Maine talus and rocky outcrop studies have focused on relatively exposed slopes with minimal canopy cover, although ongoing research has shown that bats use rocky areas under the forest canopy. Occupied talus slopes in Maine have consisted of variable rock sizes, ranging in size from softball-sized to car-sized boulders. Rock piles, rock ledges, and small vertical cracks in rocks (>1/2-inch-wide) create crevices that allow bats to access deeper cavities that provide protection from predators and suitable temperature and humidity conditions. Some species of bat, like the eastern small-footed bat, use rocky features year-round. A desktop GIS analysis does not indicate the presence of these features in your project area; however, not all talus and rocky features have been mapped statewide. Therefore, we advise that all areas of talus and rocky features of approximately 1,000 square feet or greater in size be documented on and within 250 feet of your project area, including smaller areas of rock piles and tailings (i.e., quarry spoils). See attached photographs for representative features—these photographs are not all-inclusive and should be used for guidance purposes only. Detailed photographs and coordinates should be submitted to MDIFW for review, and acoustic monitoring may be recommended to document occupancy. Alternatively, these features should be appropriately buffered commensurate with the size and layout of the project. If these features are not present in the project area, our Agency does not anticipate significant impacts to any of the bat species as a result of this project based on currently best available science.

Northern Spring Salamander - Northern spring salamanders, a State-listed Species of Special Concern, have been documented in the vicinity of the project search area. Any instream work or work adjacent to high elevation headwater streams in this area, including both unmapped perennial and intermittent streams, has the potential to impact this species. They are also found in larger third order streams and rivers with suitable substrate (large cobble and/or gravel bars) within the documented range of primarily the western Maine mountains north and east into mountains of central Penobscot County. We recommend a 250-foot riparian management zone, with no new development or permanent habitat conversion within this zone. We also recommend that existing buffers be enhanced by allowing natural succession to forested habitat occur out to at least 100 feet from occupied waterbodies where there is currently little to no existing forested buffer due to past clearing activities.

### ***Significant Wildlife Habitat***

Significant Vernal Pools - At this time MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs subject to protection under the Natural Resources Protection Act (NRPA) within the project area, which include Waterfowl and Wading Bird Habitats, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Therefore, we recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential performance standard requirements for off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, survey forms should be submitted to our Agency for review well before the submission of any necessary permits. Our Department will need to review and verify any vernal pool data prior to final determination of significance.

### ***Fisheries Habitat***

We recommend that 100-foot undisturbed vegetated buffers be maintained along streams. Buffers should be measured from the edge of stream or associated fringe and floodplain wetlands. Maintaining and enhancing buffers along streams that support coldwater fisheries is critical to the protection of water temperatures, water quality, natural inputs of coarse woody debris, and various forms of aquatic life necessary to support conditions required by many fish species. Stream crossings should be avoided, but if a stream crossing is necessary, or an existing crossing needs to be modified, it should be designed to provide full fish passage. Small streams, including intermittent streams, can provide crucial rearing habitat, cold water for thermal refugia, and abundant food for juvenile salmonids on a seasonal basis and undersized crossings may inhibit these functions. Generally, MDIFW recommends that all new, modified, and replacement stream crossings be sized to span at least 1.2 times the bankfull width of the stream. In addition, we generally recommend that stream crossings be open bottomed (i.e. natural bottom), although embedded structures which are backfilled with representative streambed material have been shown to be effective in not only providing habitat connectivity for fish but also for other aquatic organisms. Construction Best Management Practices should be closely followed to avoid erosion, sedimentation, alteration of stream flow, and other impacts as eroding soils from construction activities can travel significant distances as well as transport other pollutants resulting in direct impacts to fish and fisheries habitat. In addition, we recommend that any necessary instream work occur between July 15 and October 1.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program, Maine Department of Marine Resources, and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

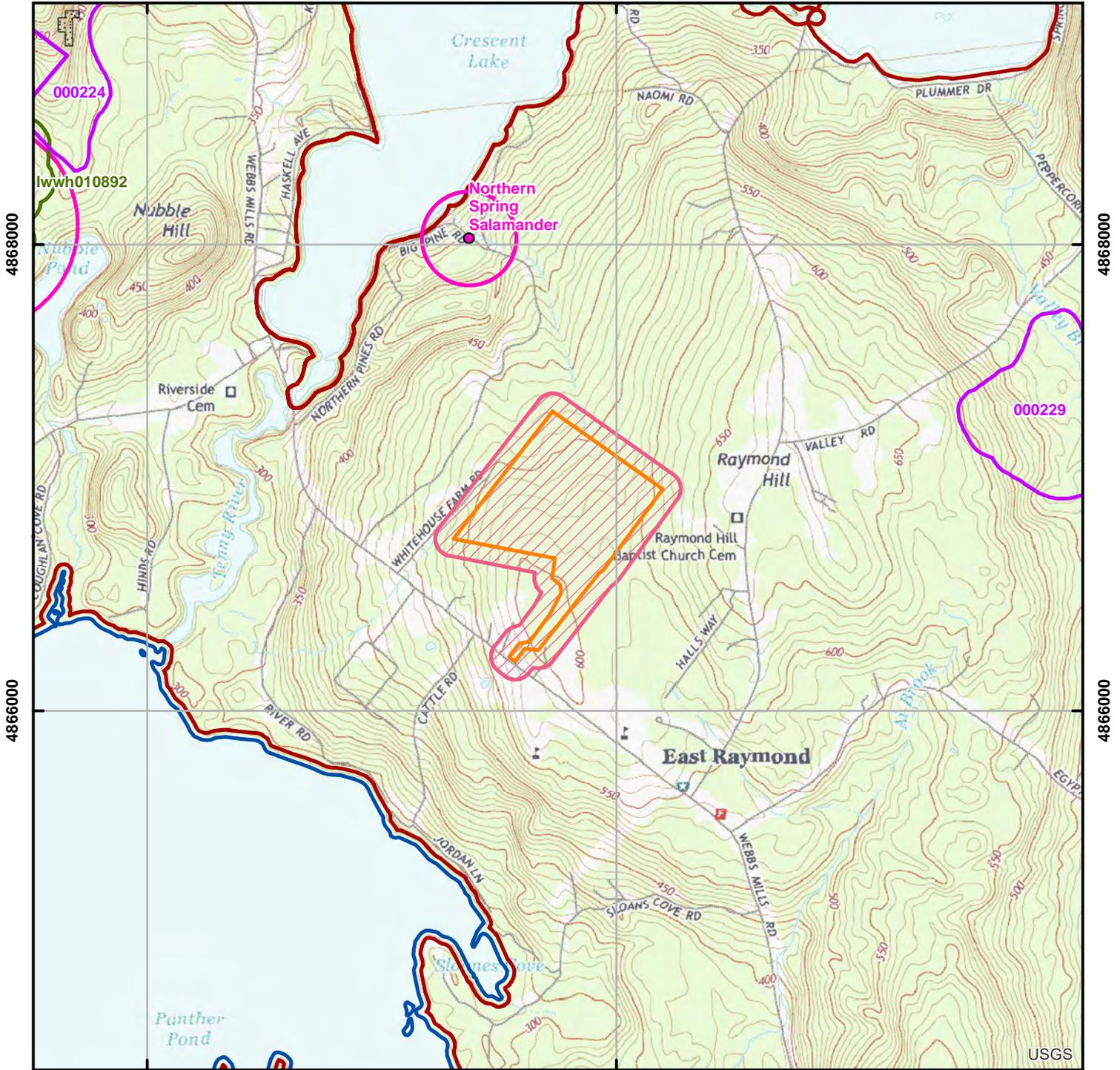
Best regards,



Becca Settele  
Wildlife Biologist

382000

384000



382000

384000

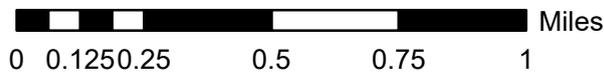


## Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: Bluewave Solar, Raymond  
(Version 1)



Maine Department of  
Inland Fisheries and Wildlife



Projection: UTM, NAD83, Zone 19N

Date: 2/22/2021



**EXHIBIT G**

---

**Natural Resources**

## EXHIBIT G: NATURAL RESOURCES

BlueWave Solar (BlueWave) is proposing the development and operation of an approximately 5.0 megawatt (MW AC) solar energy generation facility located on a portion of three parcels known as Tax Map 10, Lot 87A and 88 and Map 9, Lot 4, located off Webbs Mill Road (State Route 85) in Raymond, Maine (Site). In October of 2020, a wetland and water body delineation was performed on an 89-acre survey area of the three parcels to identify the preferred area for Project placement. This section describes protected natural resources and wildlife identified through field work, correspondence with state agencies, as well as habitats present on the Site.

### Upland Habitats

Upland forest is the dominate cover type in the approximately 89-acre survey area. A small portion of maintained field is present in the southwest portion of the Site, which connects to a larger field offsite. A transmission line that runs east to west is also present in the southeastern portion of the Site. Forested upland areas are centrally located onsite and are dominated by eastern hemlock (*Tsuga canadensis*), red maple (*Acer rubra*), American beech (*Fagus grandifolia*), eastern white pine (*Pinus strobus*), and northern red oak (*Quercus rubra*). The shrub stratum is dominated by American beech, northern red oak, eastern hemlock, and American witch hazel (*Hamamelis virginiana*). The herbaceous stratum is dense in areas such as logging roads and includes common red raspberry (*Rubus idaeus*), northern bracken fern (*Pteridium aquilinum*), white meadowsweet (*Spiraea alba*), sweetfern (*Comptonia peregrina*), and wrinkle-leafed golden rod (*Solidago rugosa*). Vines are present in the western portion of the Site, dominated by oriental bittersweet (*Celastrus orbiculatus*). Photo 1 shows a representative view of forested uplands onsite.

Photo 1: Representative view of forested uplands onsite.



## Wetland and Stream Habitats

Wetland and waterbody delineations were completed at the Site in October 2020. The weather at the time of delineation was sunny to partly cloudy, with no major rain events occurring during or prior to the field work. During the survey, the region was experiencing drought conditions.

Wetlands were delineated in accordance with the *1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0*.

Determinations of MDEP jurisdictional streams and Wetlands of Special Significance (WOSS) made during field surveys were based on the criteria defined in the Natural Resources Protection Act (NRPA, Title 38 MRSA 480-B). Identification of streams and WOSS was limited to observable conditions within the Site and available background information. USACE wetland determination data forms have been completed for representative wetlands and uplands at the Site. Copies of these forms are available upon request.

One (1) stream and seven (7) wetlands were identified, totaling approximately 4.43 acres of the survey area. **Attachment A** includes a map of onsite natural resources and Table 1 includes summary information for the wetlands identified onsite.

The Project design does not propose any impacts to wetlands and proposes a minimum 100-foot buffer from the streams identified in the survey area.

Table 1: Raymond Solar Project Wetland Summary Table

Wetland ID	Wetland Type <sup>1</sup>	WOSS <sup>2</sup>	Acres
W-MR-01	PFO	No	0.36
W-MR-02	PFO/PEM	No	0.05
W-MR-03	PFO/PEM	Yes – Within 25' of Stream	3.62
W-MR-04	PFO	No	0.25
W-MR-05	PFO	No	0.01
W-MR-06	PFO	No	0.05
W-MR-07	PFO	No	0.09
<b>Total Wetland Area</b>			<b>4.43</b>

Wetlands identified were primarily palustrine forested wetlands, but two of the seven wetlands identified also contained emergent wetland habitats. Within the overstories of the wetlands identified, the dominant trees include red maple, yellow birch (*Betula alleghaniensis*), eastern hemlock, and black ash (*Fraxinus nigra*). The shrub stratum is dominated by black ash, yellow birch, eastern hemlock, American witch hazel, nanny-berry (*Viburnum lentago*), and winterberry (*Ilex verticillata*). The herbaceous community includes lamp rush (*Juncus effusus*), cinnamon fern (*Osmundastrum cinnamomeum*), fringed sedge (*Carex crinita*), sensitive fern (*Onoclea sensibilis*), dwarf red raspberry (*Rubus pubescens*), three-leaf goldthread (*Coptis trifolia*), royal fern (*Osmunda spectabilis*), white meadowsweet (*Spiraea alba*), broadleaf cattail (*Typha latifolia*), and sparse eastern poison ivy (*Toxicodendron radicans*). Photo 2 shows a representative view of a forested wetland onsite (W-MR-01), Photo 3 shows a representative view of an emergent wetland (W-MR-03), and Photo 4 shows a representative view of the stream (S-MR-01).

<sup>1</sup> PEM-Palustrine Emergent, PFO-Palustrine Forested, PSS-Palustrine Scrub-Shrub (Cowardin et al 1979)

<sup>2</sup> Wetland of Special Significance (CMR 09-96; Ch 310)

Photo 2: Representative view of forested wetland (W-MR-01)



Photo 3: Representative view of emergent wetland (W-MR-03)



Photo 4: Representative view of the stream (S-MR-01)



## Wildlife and Fisheries

The Site includes both upland and wetland habitats, which are likely to be utilized by a wide variety of birds and wildlife. Most of the Site is upland forest and some areas of open field and a transmission line right-of-way. Most wildlife present are likely habitat generalists such as white-tailed deer (*Odocoileus virginianus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), grey squirrel (*Sciurus carolinensis*), porcupine (*Erethizon dorsatum*), and red fox (*Vulpes vulpes*). A parliament of barred owls (*Strix varia*) were observed near stream S-MR-01 on an abutting property. It is also likely that many bat species are also present during the breeding and pupping season. This is based on the large diameter trees for roosting and breeding as well as open and edge habitat for feeding.

Herpetiles onsite include common species such as garter snake (*Thamnophis sirtalis*) and smooth green snake (*Opheodrys vernalis*), which are likely in forested and open areas. Aquatic habitats, such as the wetlands and streams identified, provide both foraging and cover habitats for species such as painted turtle (*Chrysemys picta*), green frog (*Lithobates clamitans*), wood frog (*Lithobates sylvaticus*), pickerel frog (*Lithobates palustris*), and yellow spotted salamander (*Ambystoma maculatum*).

A wide variety of bird species are likely present, examples include red-winged blackbird (*Agelaius phoeniceus*), black-capped chickadee (*Poecile atricapillus*), European starling (*Sturnus vulgaris*), white-throated sparrow (*Zonotrichia albicollis*), downy woodpecker (*Picoides pubescens*), red-tailed hawk (*Buteo jamaicensis*), ruffed grouse (*Bonasa umbellus*), and American woodcock (*Scolopax minor*).

## State Listed Species and Essential Habitat

On February 22, 2021, an inquiry was sent to the Maine Department of Inland Fisheries and Wildlife (MDIFW) regarding the presence of any protected species or habitats onsite. In the inquiry response (**Exhibit F: Agency Consultation**), received March 5, 2021, MDIFW reported that the department “has not mapped any Essential Habitat that would be directly affected by your project.”

Three bat (*Myotis*) species are protected under Maine’s Endangered Species Act (MESA) and are afforded special protection under 12 MRS §12801 – §12810. The three *Myotis* species include little brown bat (*Myotis lucifugus*) (State Endangered), northern long-eared bat (*Myotis septentrionalis*) (State and Federal Endangered), and eastern small-footed bat (*Myotis leibii*) (State Threatened). The five remaining bat species are listed as Special Concern: big brown bat (*Eptesicus fuscus*), red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), and tri-colored bat (*Perimyotis subflavus*). While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the Site during migration and/or the breeding season. No rock outcrop features were observed onsite during field work. Based on inquiry response, MDIFW does not anticipate significant impacts to any of the bat species as a result of the Project because the features they detailed are not present on the Site.

The MDIFW identified that northern spring salamanders (*Gyrinophilus porphyriticus*), a State-listed Species of Special Concern, have been documented in the vicinity of the Project search area. According to the MDIFW, the species is found in larger third order streams and river with suitable substrate (large cobble and/or gravel bars). The one stream identified in the survey area, S-MR-01, matches these habitat characteristics and a photo of the stream can be seen above in Photo 4. In order to prevent potential impact to the species, MDIFW recommended additional buffering requirements surrounding the stream onsite. See Attachment B for a map of Significant Wildlife Habitat in the area surrounding the Site.

Wetland scientists performed a Potential Vernal Pool survey outside of the recommended survey window. During the survey scientists searched for depressions in the landscape with indications of sufficient depth of inundation along with a lack of inlet/out, and presence of water-stained leaves. No potential vernal pools were identified during the survey.

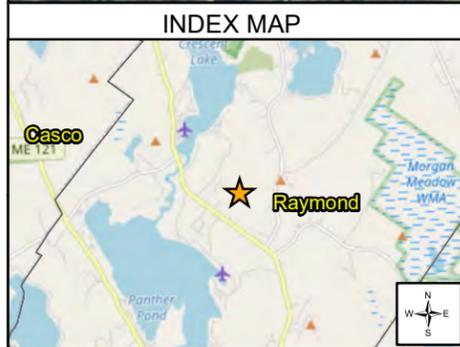
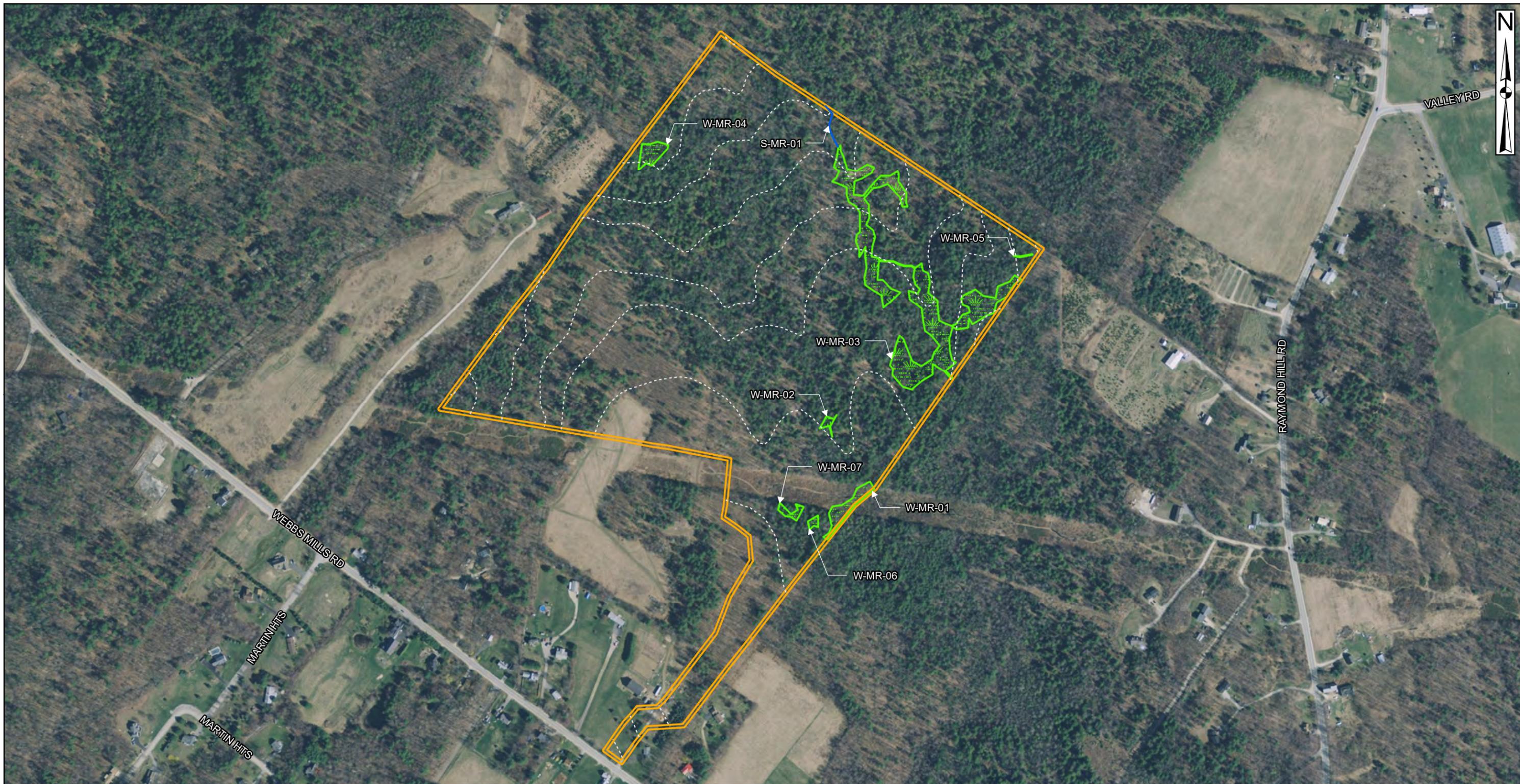
Past land use has impacted the entirety of the limit of disturbance. The Site has been recently timber harvested and is adjacent to agricultural land and a transmission right-of-way. Based on the proposed Project design, no wetlands will be impacted by construction and operation of the Project.

Any impacts to areas of forested upland will occur within areas that have been previously timber harvested. In addition, vegetated meadow conditions will be implemented within the solar array areas to provide treatment of stormwater produced by the panel posts and racks as well as the equipment pads. Solar array meadow areas will not be mowed more than twice per year and will remain vegetated.

## Avoidance Measures

The Project will avoid impacts to the wetlands identified onsite and no clearing will be conducted within wetlands. The Project does not propose any in-stream work. Due to the assumed presence of northern spring salamander onsite, a 100-foot buffer will be maintained around S-MR-01; no tree clearing, or other disturbance will occur within this buffer.

ATTACHMENT A: NATURAL RESOURCES MAP



- LEGEND**
- Project Location
  - Wetlands
  - Streams
  - 10ft Contour Intervals
  - Natural Resources Survey Boundary

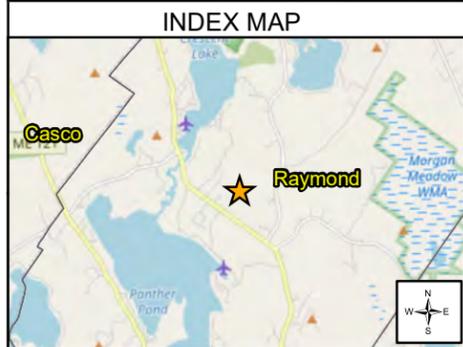
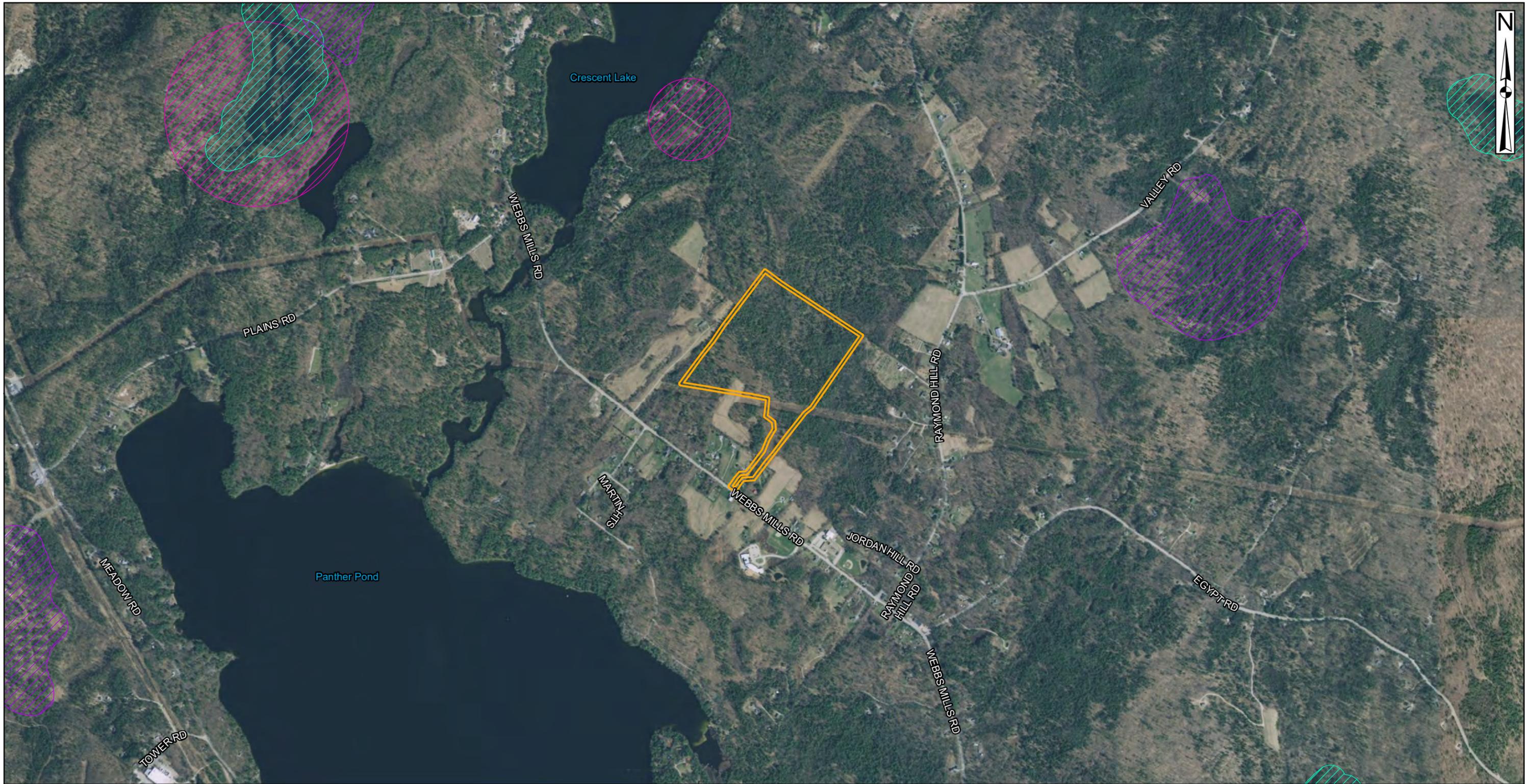
# BLUEWAVE



**ATTACHMENT A: NATURAL RESOURCES MAP  
RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

JUNE 29, 2021

**ATTACHMENT B: SIGNIFICANT WILDLIFE MAP**



<b>LEGEND</b>	★ Project Location
	Project Survey Boundary
	Maine Deer Wintering Areas
	Inland Waterfowl and Wading Bird Habitat
	Endangered Threatened and Special Concern Wildlife Habitat

**SCALE:**

1 inch = 1,500 feet

**ATTACHMENT B: SIGNIFICANT WILDLIFE HABITAT MAP RAYMOND SOLAR PROJECT: RAYMOND, MAINE**

**JUNE 29, 2021**

## EXHIBIT H

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# Stormwater Management and Erosion Control

**STORMWATER MANAGEMENT REPORT**

**RAYMOND SOLAR PROJECT  
Raymond, Maine**

Submitted by  
**BWC Lake Florida, LLC**

A Subsidiary of

**BLUEWAVE**

Prepared by:



Date:

**July 2021**

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APPENDIX B	PRE DEVELOPMENT CALCULATIONS
APPENDIX C	POST DEVELOPMENT CALCULATIONS
APPENDIX D	TREATMENT CALCULATIONS
APPENDIX E	TEMPLATE BUFFER DEED RESTRICTIONS
APPENDIX F	CHECKLIST

## 1.0 INTRODUCTION

Bluewave Solar is proposing the development and operation of an approximately 5.0 megawatt (MW) solar energy generation facility located in Raymond, Maine. The proposed Raymond Solar Project (the Project) will be located on Tax Map 10 Lots 87A & 88. The parcels are located on the north side of Webbs Mill Road (Route 85).

The scope of work includes but is not limited to:

- Tree clearing
- Stump and boulder removal
- Construction of 18-ft wide gravel access roads and passing areas
- Construction of a temporary staging areas
- Installation of solar panels and associated support equipment and structures
- Installation of buried and overhead collector lines
- Restoration of select disturbed areas

The proposed infrastructure improvements will create approximately 1.05 acres of new impervious area.

The Stormwater Management Plan has been prepared to satisfy the requirements of the Maine Department of Environmental Protections “Stormwater Management Rules” Chapters 500, 501 and 502 as well as the most recent version of the “Maine Stormwater Best Management Practices Manual”. The proposed project will also require a Site Location of Development Act Permit and will be required to meet the Basic, General, and Flooding Standards.

## 1.1 OVERVIEW OF MODELING METHODOGY AND SOURCE INFORMATION

Hydrologic Analysis: The pre and post development conditions have been modeled using modeling software (Hydrocad Version 10) which is based upon the methodology contained within the USDA Soil Conservation Service Technical Release 55. Type III 24-hour storm distributions for Cumberland County South were used for the analysis. The following frequencies and 24-hour rainfall depths were used for the analysis:

Return Period	24-Hour Rainfall Depth
2-Year Storm	3.10 inches
10-Year Storm	4.60 inches
25-Year Storm	5.80 inches

Soils: The soils used for the stormwater analysis were digitized from the Natural Resource Conservation Service (NRCS), web soil survey website. The source of the data is the Cumberland County and Part of Oxford County Maine, Soil Survey (Class D). Refer to the following for additional documentation regarding the soils used for modelling:

- Appendix A of this Report
- Section 11 of the SLODA Application
- Pre and Post Development Stormwater Plans (Sheets C-3.0 and C-3.1)

The soils include:

Soil Map Unit	Unit Description	Hydrologic Soil Group
PbB	Paxton fine sandy loam, 3-8% slopes	C
PbC	Paxton fine sandy loam, 8-15% slopes	C
PfB	Paxton very stony fine sandy loam, 3-8% slopes	C
WrB	Woodbridge fine sandy loam, 0-8% slopes	C
WsB	Woodbridge very stony fine sandy loam, 0-8% slopes	C

- Boundary Survey: Field survey by Sackett & Brake Survey, Inc.
- Topography: LIDAR data from the Maine Office of GIS
- Natural Resources: Wetland delineations performed by Boyle Associates

## 1.2 **DESCRIPTION OF POINTS OF ANALYSIS**

The watershed model analyzes the discharge of runoff at five Analysis Points as described below:

### Analysis Point #1

Description: Broad, overland discharge along the northern corner of the property  
 Pre-Development Tributary Drainage Areas: 110.13 acres  
 Post Development Tributary Drainage Areas: 110.13 acres

### Analysis Point #2

Description: Broad, overland discharge along western corner of the property  
 Pre-Development Tributary Drainage Areas: 16.72 acres  
 Post Development Tributary Drainage Areas: 16.72 acres

Analysis Point #3

Description: Broad, overland discharge along south western corner of the property

Pre-Development Tributary Drainage Areas: 10.29 acres

Post Development Tributary Drainage Areas: 10.29 acres

Analysis Point #4

Description: Concentrated point along eastern side of property

Pre-Development Tributary Drainage Areas: 9.96 acres

Post Development Tributary Drainage Areas: 9.96 acres

Analysis Point #5

Description: Broad overland discharge to southern property line

Pre-Development Tributary Drainage Areas: 8.93 acres

Post Development Tributary Drainage Areas: 8.93 acres

**1.3 PRE DEVELOPMENT CONDITIONS**

The Pre Development Conditions are shown on Sheet C-3.0 – Pre Development Stormwater of the accompanying plans. The project area to be disturbed encompasses an area of approximately 43.83 acres and is located on the northern side of Webbs Mills Road (Route 85). The project area is located on a parcels with mostly undeveloped wooded areas with some open fields and houses towards Webbs Mills Road. The project lies within the Panther Pond Watershed.

The watershed that was analyzed for this project is approximately 156 acres. The analysis points are described in Section 1.2 of this report.

The Pre Development Stormwater Plan is included as Sheets C-3.0 of the accompanying plans and the Calculations are attached as Appendix B.

The Pre Development Watershed Model predicts the following peak flow rates:

<b>Pre Development Peak Flows (cu. ft./sec)</b>			
<b>Analysis Point</b>	<b>2-Year</b>	<b>10-Year</b>	<b>25-Year</b>
AP-1	34.22	83.17	127.77
AP-2	5.44	13.20	20.28
AP-3	3.85	9.04	13.73
AP-4	3.50	8.46	12.98
AP-5	3.86	8.60	12.80

---

## 1.4 POST DEVELOPMENT CONDITIONS

The proposed project will include development of a 5.0 MW solar energy facility. To support the development, approximately 2,435 linear feet of new gravel access roads will be constructed as well as supporting equipment pads and racking posts for the panels. The total disturbed area associated with development of the project is approximately 43.83 acres. Most of the disturbed area is associated with construction of the proposed solar panels. The proposed impervious area is approximately 1.05 acres, this includes the new access roads, equipment pads, racking posts, and fence posts. See Section 1.6 for additional details.

The proposed project will utilize forested and meadow buffers to provide water quality treatment. Refer to Section 1.6 for detailed design calculations of the proposed buffer areas.

The Post Development Watershed Map is included as Sheet B of the accompanying plan set and the Calculations are attached as Appendix C.

The Post-Development Watershed Model predicts the following peak flow rates:

<b>Post Development Peak Flows (cu. ft./sec)</b>			
<b>Analysis Point</b>	<b>2-Year</b>	<b>10-Year</b>	<b>25-Year</b>
AP-1	34.22	83.17	127.77
AP-2	5.44	13.20	20.28
AP-3	3.85	9.04	13.73
AP-4	3.50	8.46	12.98
AP-5	3.86	8.60	12.80

## 1.5 BASIC STANDARDS

The proposed project is required to meet the Basic Standards. To meet the Basic Standards the project design must demonstrate that the erosion and sedimentation control, inspection and maintenance, and housekeeping standards specified in Appendices A, B, and C of 06-096 Chapter 500 are met, and that the grading or other construction activity will not impede or otherwise alter drainageways so as to have an unreasonable adverse impact on a wetland or waterbody, or an adjacent downslope parcel.

The proposed project will provide temporary (during construction) BMP's and post-construction BMP's. Refer to Sheets C-5.0 and C-5.1 of the Project Plans for erosion and sedimentation control narratives and details. The project requirements for inspection and maintenance during construction and post-construction are described in the Erosion and Sedimentation Control - Inspection and Maintenance Plan found in Section 14 of the SLODA Application. The housekeeping standards can also be found in the Inspection and Maintenance Plan.

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## 1.6 GENERAL STANDARDS

The proposed project is required to meet the General Standards. To meet the general standards, the project design must demonstrate that the stormwater management system includes treatment measures that will provide pollutant removal or treatment, and mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms and potential temperature impacts. This must be achieved by providing treatment of no less than 95% of the impervious area and no less than 80% of the developed area. For linear portions of projects, the treatment requirements can be reduced to no less than 75% of the impervious area and no less than 50% of the developed area (See 06-096 Chapter 500 4.C(5)(c)).

Proposed improvements associated with development of the project that are considered impervious (i.e. stripped, graded, and not revegetated) will include the posts and racks that support the solar panels, equipment pads, and the 18-foot wide gravel access road. The solar panels are not considered to be impervious area by the MEDEP as they do not meet the definition of “impervious area” as defined in 06-096 Chapter 500 Section 3(L). Ground areas located within the solar arrays will be revegetated and managed in a way consistent with the requirements of meadow conditions. The vegetated areas will not be mowed more than twice per year and will be routinely inspected to confirm that vegetation is healthy, well established, and free of debris and signs of erosion. With this management approach, the vegetated area within the solar arrays is not considered “landscaped area” as defined in 06-096 Chapter 500 3(O). Since the meadow areas are not considered “landscape area” it is also not considered “developed area” as defined in 06-096 Chapter 500 3(D).

The total disturbed areas associated with the project will be approximately 43.83 acres. The majority of the disturbed area is associated with installation of the solar panels and is not considered “developed area”. The developed area considered consists of the proposed access roads, posts and racks for the solar panels, and the equipment pads.

### Stormwater Treatment Method

The project proposes a meadow condition be maintained within the solar array. The solar array will remain vegetated and will not be mowed more than twice per year. These areas within the solar array are considered self-treated for the panels, posts, and racks as well as the equipment pads. In general, slopes within the solar array areas are less than 15%. Roadside buffers will be utilized for treatment of portions of the proposed gravel access roads. Ditch turnout buffers are proposed in areas where runoff will concentrate along the edge of the road. These turnouts will allow runoff to sheet flow to buffers. The locations of the proposed roadside buffers are illustrated on Stormwater Treatment Plan, Sheet C-2.0 of the Project Plans.

The proposed roadside buffers have been designed in conformance with the Maine Stormwater Best Management Practices Manual (BMP Manual), Volume III, Chapter

5 – Vegetated Buffers, Section 5.3 – Buffer Adjacent to the Downhill Side of a Road (i.e. Roadside Buffer). The proposed access roads will be constructed “at-grade” without formalized ditching. Utilizing roadside buffers is an appropriate buffering strategy for this method of road construction. In accordance with the design requirements contained in the BMP Manual, roadside buffer design does not vary with soil type or slope, except that roadside buffers cannot be used when slopes exceed 20% or are located in wetland soils. The roadside buffers proposed are located in upland areas having slopes less than 20%. Sizing of roadside buffers depends only on the vegetative cover (i.e. forested or meadow) and the number of travel lanes. Proposed roadside buffers will be maintained in a meadow condition and the proposed gravel access road will be constructed to 18-foot wide (two travel lanes). For reference, below is the roadside buffer table contained in the BMP Manual, Volume III, Chapter 5, Section 5.3. (See Table 5.6).

<b>Buffer Flow Path Length Downgradient of Road (feet)</b>		
	<b>Forested Buffer</b>	<b>Meadow Buffer</b>
One Travel Lane	35	50
Two Travel Lanes	55	80

In accordance with the Table shown above, the proposed roadside buffers must have a minimum flow path of 35 feet for single lane, and 55 feet two lane, consistent with forested buffer conditions.

Ditch turnout buffers have been designed in accordance with Section 5.4 of the BMP manual. Given certain areas of the access roads are proposed to run perpendicular to grade, runoff may concentrate. In these areas, a level spreader will allow the concentrated flow to be spread back to sheet flow and make appropriate use of downgradient buffer areas. The BMP manual provides design guidance on the ditch turnout buffers, where the level spreader must be a minimum of 20’ long, and the buffer length based on table 5.7 for single lane roads. For two lane roads, Section 5.4 provides guidance that a maximum of 250’ linear feet of road may be treated, but should use the 400’ parameters. The project consists of HSG C Sandy Loam soils and forested and meadow buffer conditions. An excerpt of table 5.7 showing the parameters for these conditions is provided below:

<b>Buffer Flow Path Length per Length of Single Lane Road or Ditch (feet)</b>					
		<b>0-8% Slope</b>		<b>9-15% Slope</b>	
<b>Hydrologic Soil Group</b>	<b>Length of Road or Ditch (feet)</b>	<b>Forested</b>	<b>Meadow</b>	<b>Forested</b>	<b>Meadow</b>
C Loamy Sand or Sandy Loam	200	60	100	72	120
	300	75	120	90	144
	400	100	N/A	120	N/A

In accordance with this table, buffers have been sized based on the length of road run off towards the buffer, cover type, and the slope of the buffer. The conditions for these areas of proposed buffers include some areas of HSG C soil meadow conditions. For these areas, a proration of the single lane 400 linear feet to two lane 250 linear feet guideline has been applied to limit 2 lane applications of ditch turn out buffers to 187.5 linear feet of two-lane access road for HSG C sandy loam meadow conditions, utilizing the 300' long single lane buffer length criteria. See buffer sizing details in the water quality treatment calculations table provided in Appendix D.

Stormwater buffers are required to be to be deed restricted to preserve their treatment capacity and prohibit excessive clearing of vegetation and development within the buffer area. Sample limited disturbance deed restriction language for both meadow and forested buffers is included in Appendix E.

### Non-Linear Project Components

Non-Linear project components consist of the posts and racks for the solar panels as well as the pad areas for proposed equipment which are considered self treated by the proposed meadow conditions within the array. The total non-linear impervious area proposed is:

Racking Posts:	50 sq. ft.	
Fence Posts:	50 sq. ft.	
<u>Equipment Pads:</u>	<u>520 sq. ft.</u>	
<b>Total:</b>	<b>620 sq. ft.</b>	<b>(0.01 acres)</b>

### Linear Project Components

Linear project components consist of the proposed 18-foot wide gravel access roads. The proposed project will include new construction of approximately 2,390 linear feet of new gravel access roads. The total proposed linear impervious area is 49,838 sq. ft. (1.14 acres).

The following Tables summarize the treatment calculations for non-linear and linear project development.

<b>Non-Linear Treatment Summary</b>	
Total Proposed (Non-Linear) Impervious Area	0.01 acres
Total Proposed (Non-Linear) Developed Area	0.01 acres
Total Treated (Non-Linear) Impervious Area	0.01 acres
Total Treated (Non-Linear) Developed Area	0.01 acres
<b>Non-Linear Impervious Area Treatment %</b>	<b>100% (95% required)</b>
<b>Non-Linear Developed Area Treatment %</b>	<b>100% (80% required)</b>

<b>Linear Treatment Summary</b>	
Total Proposed (Linear) Impervious Area	1.14 acres
Total Proposed (Linear) Developed Area	1.14 acres
Total Treated (Linear) Impervious Area	0.91 acres
Total Treated (Linear) Developed Area	0.91 acres
<b>Linear Impervious Area Treatment %</b>	<b>79.60% (75% required)</b>
<b>Linear Developed Area Treatment %</b>	<b>79.60% (50% required)</b>

As shown in the Table above, the stormwater management system has been designed to meet the General Standards requirements. Detailed linear treatment calculations can be found in Appendix D and the proposed locations of Buffers are illustrated on Sheet C-2.0 of the Project Plans.

### **1.7 PHOSPHORUS STANDARD**

The proposed project is located in the Panther Pond Watershed. Panther Pond is listed as a Lake Most at Risk in Chapter 502. Phosphorus Standard will apply to projects that meet the following conditions from Chapter 500:

- (a) When the project is located in the direct watershed of a lake most-at-risk. A development with 20,000 square feet or more of impervious area, or 5 acres or more of developed area in the direct watershed of a lake most-at risk must meet the phosphorous standard. The general standards may be used if the lake is not severely blooming and if the project results in less than 3 acres of impervious area and less than 5 acres of developed area. Severe blooming lakes are a subset of lakes most-at-risk as listed in 06-096 CMR 502; or
- (b) When the project is located in any other lake watershed. A development with one acre or more of impervious area or 5 acres or more of developed area in any other lake watershed may use the general standards if the project results in less than 3 acres of impervious area and less than 5 acres of developed area.

Panther Pond is not listed as severely blooming. Given that the project is proposed to have less than 3 acres of impervious area (1.16 acres proposed), and given the proposed condition of meadow for disturbed areas does not meet the definition of “Developed Area”, the project does not meet criteria for application of the Phosphorus Standard. The General Standard, which the project proposes to meet, will apply.

### **1.8 URBAN IMPAIRED STREAM STANDARD**

The project is located in the Panther Pond Watershed, which is not listed in 06-096 Chapter 502. As such, the proposed project is not located within the direct watershed of an urban impaired stream or stream segment, and the Urban Impaired Stream Standard does not apply to this project.

## 1.9 FLOODING STANDARD

The proposed project is required to meet the Flooding Standards. To meet the Flooding Standard, the project design must demonstrate that the stormwater management systems will accomplish the following:

- a) The system must detain, retain, or result in the infiltration of stormwater from 24-hour storms of the 2-year, 10-year, and 25-year frequencies such that the peak flows of stormwater from the project site do not exceed the peak flows of stormwater prior to undertaking the project.
- b) The design of piped or open channel systems must be based on a 10-year, 24-hour storm without overloading or flooding beyond channel limits.
- c) The areas expected to be flooded by runoff from a 10-year or 25-year, 24-hour storm must be defined, and no buildings or other similar facilities may be planned within such areas.
- d) Runoff from the project may not flood the primary access road to the project and any public roads bordering the project as a result of a 25-year, 24-hour storm.

The following Table compares the Pre and Post Development peak flow rates for the 2-year, 10-year, and 25-year return periods. Refer to Appendix B for the Pre-Development model and Appendix C for Post Development model.

<b>Peak Flow Comparison (cu. ft./sec)</b>						
<b>Analysis Point</b>	<b>2-Year</b>		<b>10-Year</b>		<b>25-Year</b>	
	<b>Pre</b>	<b>Post</b>	<b>Pre</b>	<b>Post</b>	<b>Pre</b>	<b>Post</b>
AP-1	34.22	34.22	83.17	83.17	127.77	127.77
AP-2	5.44	5.44	13.20	13.20	20.28	20.28
AP-3	3.85	3.85	9.04	9.04	13.73	13.73
AP-4	3.50	3.50	8.46	8.46	12.98	12.98
AP-5	3.86	3.86	8.60	8.60	12.80	12.80

As illustrated in the table above, development of the proposed project will not create a condition where peak flows of stormwater from the project site exceed the peak flows for the project.

## 1.10 CLOSURE

The proposed stormwater management facilities have been designed to mitigate stormwater impacts associated with development of the proposed project. The proposed stormwater management facilities have been designed to meet the Basic, General and Flooding Standards required by Chapter 500.

**Appendix A**  
**Soils Report**



United States  
Department of  
Agriculture

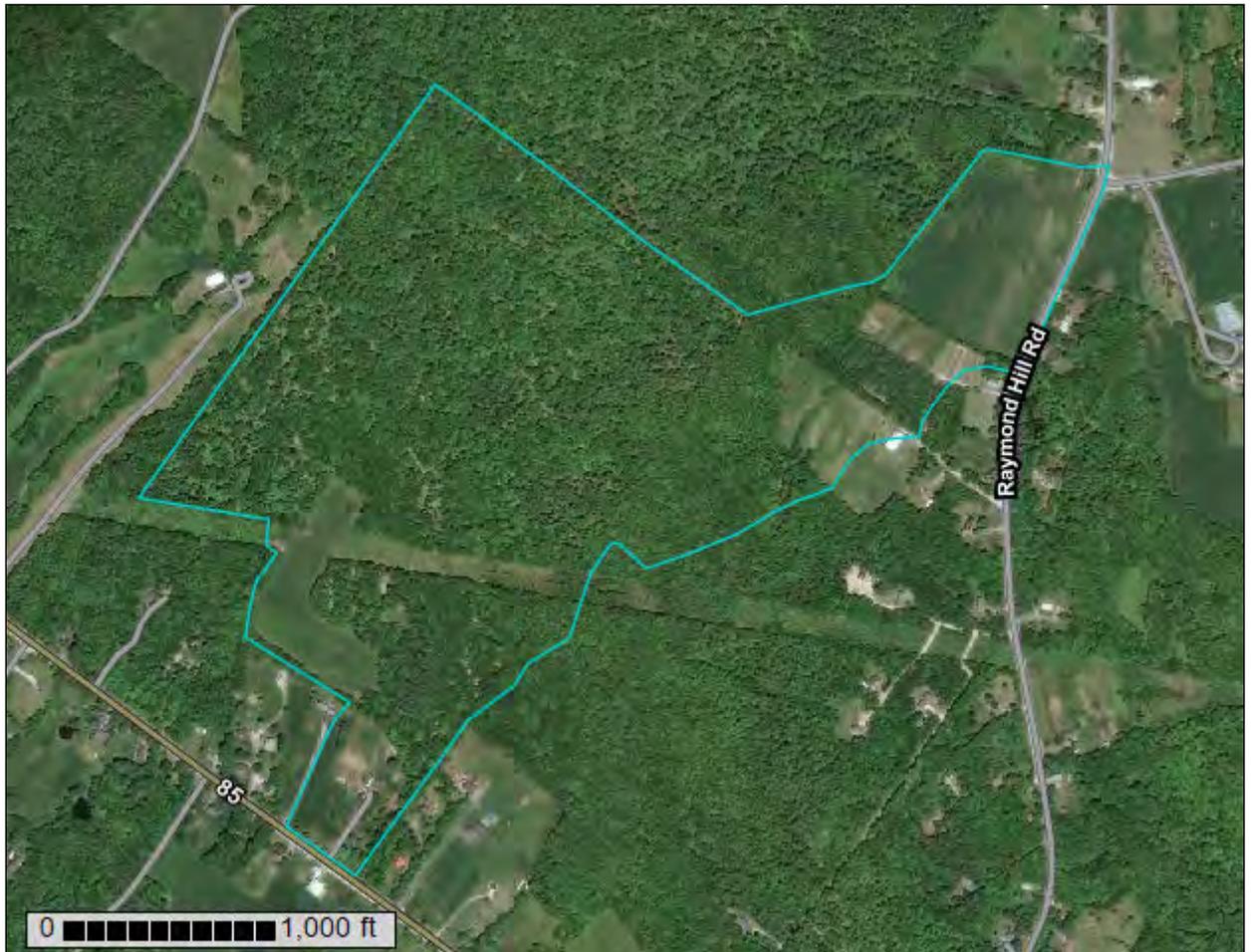
**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for Cumberland County and Part of Oxford County, Maine

Raymond Solar



# Preface

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Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

---

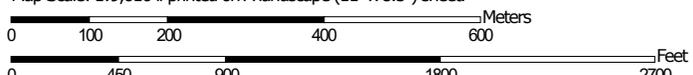
The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map



Soil Map may not be valid at this scale.

Map Scale: 1:9,610 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)

**Soils**

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

**Special Point Features**

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

**Water Features**

 Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine  
 Survey Area Data: Version 17, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 7, 2019—Jul 2, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

**MAP LEGEND**

**MAP INFORMATION**

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PbB	Paxton fine sandy loam, 3 to 8 percent slopes	114.5	73.4%
PbC	Paxton fine sandy loam, 8 to 15 percent slopes	4.4	2.8%
PfB	Paxton very stony fine sandy loam, 3 to 8 percent slopes	2.8	1.8%
WrB	Woodbridge fine sandy loam, 0 to 8 percent slopes	12.8	8.2%
WsB	Woodbridge very stony fine sandy loam, 0 to 8 percent slopes	21.6	13.8%
<b>Totals for Area of Interest</b>		<b>156.0</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

## Custom Soil Resource Report

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Cumberland County and Part of Oxford County, Maine

### PbB—Paxton fine sandy loam, 3 to 8 percent slopes

#### Map Unit Setting

*National map unit symbol:* bljf  
*Elevation:* 0 to 3,500 feet  
*Mean annual precipitation:* 34 to 50 inches  
*Mean annual air temperature:* 37 to 46 degrees F  
*Frost-free period:* 90 to 160 days  
*Farmland classification:* All areas are prime farmland

#### Map Unit Composition

*Paxton and similar soils:* 87 percent  
*Minor components:* 13 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Paxton

##### Setting

*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Summit, shoulder  
*Landform position (three-dimensional):* Interfluve, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Coarse-loamy lodgment till derived from mica schist

##### Typical profile

*H1 - 0 to 8 inches:* fine sandy loam  
*H2 - 8 to 20 inches:* fine sandy loam  
*H3 - 20 to 65 inches:* fine sandy loam

##### Properties and qualities

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* 18 to 40 inches to densic material  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)  
*Depth to water table:* About 30 to 42 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water capacity:* Very low (about 2.9 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2e  
*Hydrologic Soil Group:* C  
*Hydric soil rating:* No

#### Minor Components

##### Colonel

*Percent of map unit:* 4 percent  
*Landform:* Drumlinoid ridges, till plains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope

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*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

### **Berkshire**

*Percent of map unit:* 3 percent  
*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Summit, shoulder  
*Landform position (three-dimensional):* Nose slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

### **Woodbridge**

*Percent of map unit:* 3 percent  
*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Summit, shoulder  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

### **Ridgebury**

*Percent of map unit:* 2 percent  
*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Summit, shoulder  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

### **Paxton, 0.1 to 3% stone cover**

*Percent of map unit:* 1 percent  
*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Summit, shoulder  
*Landform position (three-dimensional):* Interfluve, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

## **PbC—Paxton fine sandy loam, 8 to 15 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* bljg  
*Elevation:* 0 to 3,500 feet  
*Mean annual precipitation:* 34 to 50 inches  
*Mean annual air temperature:* 37 to 46 degrees F  
*Frost-free period:* 100 to 160 days  
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Paxton and similar soils: 86 percent*

*Minor components: 14 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Paxton**

**Setting**

*Landform: Drumlinoid ridges*

*Landform position (two-dimensional): Backslope, shoulder*

*Landform position (three-dimensional): Crest, nose slope*

*Down-slope shape: Linear*

*Across-slope shape: Convex*

*Parent material: Coarse-loamy lodgment till derived from mica schist*

**Typical profile**

*H1 - 0 to 8 inches: fine sandy loam*

*H2 - 8 to 20 inches: fine sandy loam*

*H3 - 20 to 65 inches: fine sandy loam*

**Properties and qualities**

*Slope: 8 to 15 percent*

*Depth to restrictive feature: 18 to 40 inches to densic material*

*Drainage class: Well drained*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)*

*Depth to water table: About 30 to 42 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Available water capacity: Very low (about 2.9 inches)*

**Interpretive groups**

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 3e*

*Hydrologic Soil Group: C*

*Hydric soil rating: No*

**Minor Components**

**Woodbridge**

*Percent of map unit: 4 percent*

*Landform: Drumlinoid ridges*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Side slope*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Hydric soil rating: No*

**Colonel**

*Percent of map unit: 3 percent*

*Landform: Drumlinoid ridges, till plains*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Side slope*

*Down-slope shape: Convex*

*Across-slope shape: Linear*

*Hydric soil rating: No*

## Custom Soil Resource Report

### **Berkshire**

*Percent of map unit:* 3 percent  
*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Nose slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

### **Lyman**

*Percent of map unit:* 2 percent  
*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Shoulder  
*Landform position (three-dimensional):* Crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

### **Rock outcrop**

*Percent of map unit:* 2 percent  
*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Shoulder  
*Landform position (three-dimensional):* Crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

## **PfB—Paxton very stony fine sandy loam, 3 to 8 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* bljj  
*Elevation:* 10 to 2,500 feet  
*Mean annual precipitation:* 34 to 50 inches  
*Mean annual air temperature:* 37 to 46 degrees F  
*Frost-free period:* 60 to 160 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Paxton and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Paxton**

#### **Setting**

*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Summit, shoulder  
*Landform position (three-dimensional):* Interfluve, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex

## Custom Soil Resource Report

*Parent material:* Coarse-loamy lodgment till derived from mica schist

### Typical profile

*Oa - 0 to 2 inches:* highly decomposed plant material

*H1 - 2 to 8 inches:* fine sandy loam

*H2 - 8 to 20 inches:* fine sandy loam

*H3 - 20 to 65 inches:* fine sandy loam

### Properties and qualities

*Slope:* 3 to 8 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 18 to 40 inches to densic material

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)

*Depth to water table:* About 30 to 42 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* Low (about 3.5 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* C

*Hydric soil rating:* No

### Minor Components

#### Tunbridge

*Percent of map unit:* 4 percent

*Landform:* Drumlinoid ridges

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Crest

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Hollis

*Percent of map unit:* 4 percent

*Landform:* Drumlinoid ridges

*Landform position (two-dimensional):* Summit, shoulder

*Landform position (three-dimensional):* Interfluve, crest

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Hydric soil rating:* No

#### Colonel

*Percent of map unit:* 2 percent

*Landform:* Drumlinoid ridges, till plains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Woodbridge

*Percent of map unit:* 2 percent

*Landform:* Drumlinoid ridges

## Custom Soil Resource Report

*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

### **Ridgebury**

*Percent of map unit:* 2 percent  
*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

### **Paxton, slopes >8%**

*Percent of map unit:* 1 percent  
*Landform:* Drumlinoid ridges  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Nose slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

## **WrB—Woodbridge fine sandy loam, 0 to 8 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* blkf  
*Elevation:* 0 to 3,500 feet  
*Mean annual precipitation:* 34 to 50 inches  
*Mean annual air temperature:* 37 to 46 degrees F  
*Frost-free period:* 90 to 160 days  
*Farmland classification:* All areas are prime farmland

### **Map Unit Composition**

*Woodbridge and similar soils:* 86 percent  
*Minor components:* 14 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Woodbridge**

#### **Setting**

*Landform:* Till plains  
*Landform position (two-dimensional):* Shoulder, backslope  
*Landform position (three-dimensional):* Crest, side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Coarse-loamy lodgment till derived from mica schist

#### **Typical profile**

*H1 - 0 to 3 inches:* fine sandy loam

## Custom Soil Resource Report

*H2 - 3 to 20 inches: fine sandy loam*

*H3 - 20 to 65 inches: fine sandy loam*

### Properties and qualities

*Slope: 0 to 8 percent*

*Depth to restrictive feature: 16 to 36 inches to densic material*

*Drainage class: Moderately well drained*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)*

*Depth to water table: About 18 to 30 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Available water capacity: Very low (about 2.8 inches)*

### Interpretive groups

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 2e*

*Hydrologic Soil Group: C*

*Hydric soil rating: No*

### Minor Components

#### Colonel

*Percent of map unit: 6 percent*

*Landform: Drumlinoid ridges, till plains*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Side slope*

*Down-slope shape: Convex*

*Across-slope shape: Linear*

*Hydric soil rating: No*

#### Paxton

*Percent of map unit: 3 percent*

*Landform: Till plains*

*Landform position (two-dimensional): Shoulder, backslope*

*Landform position (three-dimensional): Nose slope*

*Down-slope shape: Convex*

*Across-slope shape: Convex*

*Hydric soil rating: No*

#### Ridgebury

*Percent of map unit: 3 percent*

*Landform: Till plains*

*Landform position (two-dimensional): Footslope*

*Landform position (three-dimensional): Base slope*

*Down-slope shape: Concave*

*Across-slope shape: Concave*

*Hydric soil rating: Yes*

#### Berkshire

*Percent of map unit: 2 percent*

*Landform: Till plains*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Nose slope*

*Down-slope shape: Convex*

*Across-slope shape: Convex*

*Hydric soil rating: No*

## **WsB—Woodbridge very stony fine sandy loam, 0 to 8 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* blkh  
*Elevation:* 10 to 2,500 feet  
*Mean annual precipitation:* 34 to 49 inches  
*Mean annual air temperature:* 37 to 46 degrees F  
*Frost-free period:* 90 to 160 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Woodbridge and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Woodbridge**

#### **Setting**

*Landform:* Till plains  
*Landform position (two-dimensional):* Shoulder, backslope  
*Landform position (three-dimensional):* Crest, side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Coarse-loamy lodgment till derived from mica schist

#### **Typical profile**

*Oa - 0 to 2 inches:* highly decomposed plant material  
*H1 - 2 to 5 inches:* fine sandy loam  
*H2 - 5 to 22 inches:* fine sandy loam  
*H3 - 22 to 65 inches:* fine sandy loam

#### **Properties and qualities**

*Slope:* 0 to 8 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 16 to 36 inches to densic material  
*Drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)  
*Depth to water table:* About 18 to 30 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water capacity:* Low (about 3.5 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C  
*Hydric soil rating:* No

**Minor Components**

**Colonel**

*Percent of map unit:* 8 percent  
*Landform:* Drumlinoid ridges, till plains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Ridgebury**

*Percent of map unit:* 3 percent  
*Landform:* Till plains  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**Paxton**

*Percent of map unit:* 3 percent  
*Landform:* Till plains  
*Landform position (two-dimensional):* Shoulder, backslope  
*Landform position (three-dimensional):* Crest, nose slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Woodbridge, slopes >8%**

*Percent of map unit:* 1 percent  
*Landform:* Till plains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

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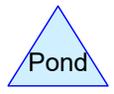
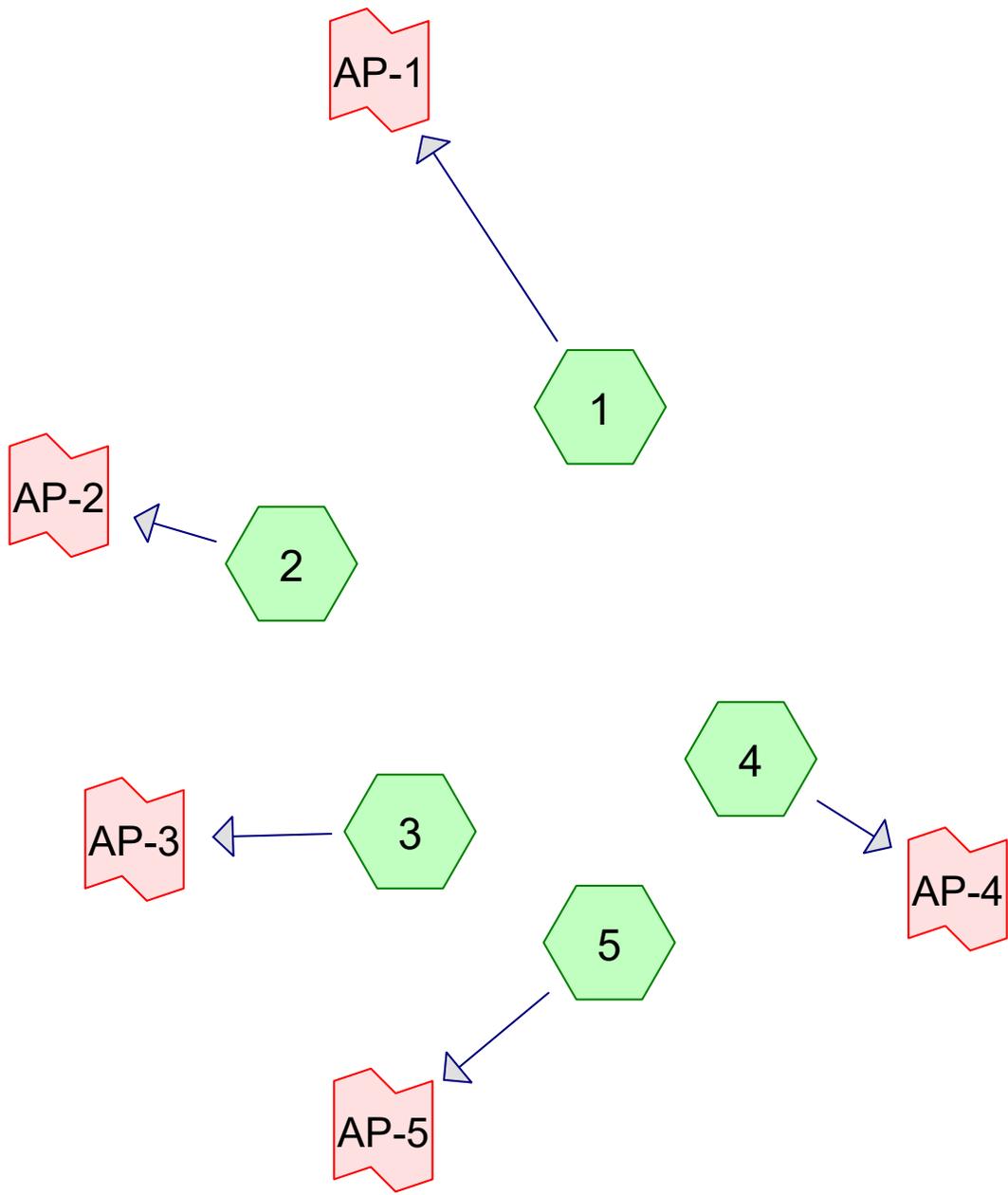
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**Appendix B**  
**Pre-Development Calculations**



**Routing Diagram for Pre-Development**  
Prepared by Hewlett-Packard Company, Printed 7/13/2021  
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## Pre-Development

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Type III 24-hr 2-YR Rainfall=3.10"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 1:</b>	Runoff Area=4,797,455 sf 0.53% Impervious Runoff Depth>0.72" Flow Length=3,501' Tc=68.1 min CN=71 Runoff=34.22 cfs 6.572 af
<b>Subcatchment 2:</b>	Runoff Area=728,513 sf 0.00% Impervious Runoff Depth>0.72" Flow Length=1,237' Tc=63.3 min CN=71 Runoff=5.44 cfs 1.001 af
<b>Subcatchment 3:</b>	Runoff Area=448,250 sf 0.00% Impervious Runoff Depth>0.77" Flow Length=804' Tc=57.1 min CN=72 Runoff=3.85 cfs 0.658 af
<b>Subcatchment 4:</b>	Runoff Area=433,642 sf 0.00% Impervious Runoff Depth>0.72" Flow Length=898' Tc=55.8 min CN=71 Runoff=3.50 cfs 0.598 af
<b>Subcatchment 5:</b>	Runoff Area=388,972 sf 4.27% Impervious Runoff Depth>0.86" Flow Length=927' Tc=56.8 min CN=74 Runoff=3.86 cfs 0.643 af
<b>Link AP-1:</b>	Inflow=34.22 cfs 6.572 af Primary=34.22 cfs 6.572 af
<b>Link AP-2:</b>	Inflow=5.44 cfs 1.001 af Primary=5.44 cfs 1.001 af
<b>Link AP-3:</b>	Inflow=3.85 cfs 0.658 af Primary=3.85 cfs 0.658 af
<b>Link AP-4:</b>	Inflow=3.50 cfs 0.598 af Primary=3.50 cfs 0.598 af
<b>Link AP-5:</b>	Inflow=3.86 cfs 0.643 af Primary=3.86 cfs 0.643 af

**Total Runoff Area = 156.034 ac Runoff Volume = 9.472 af Average Runoff Depth = 0.73"**  
**99.38% Pervious = 155.064 ac 0.62% Impervious = 0.969 ac**

## Pre-Development

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Type III 24-hr 10-YR Rainfall=4.60"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 1:</b>	Runoff Area=4,797,455 sf 0.53% Impervious Runoff Depth>1.63" Flow Length=3,501' Tc=68.1 min CN=71 Runoff=83.17 cfs 14.949 af
<b>Subcatchment 2:</b>	Runoff Area=728,513 sf 0.00% Impervious Runoff Depth>1.63" Flow Length=1,237' Tc=63.3 min CN=71 Runoff=13.20 cfs 2.275 af
<b>Subcatchment 3:</b>	Runoff Area=448,250 sf 0.00% Impervious Runoff Depth>1.71" Flow Length=804' Tc=57.1 min CN=72 Runoff=9.04 cfs 1.465 af
<b>Subcatchment 4:</b>	Runoff Area=433,642 sf 0.00% Impervious Runoff Depth>1.64" Flow Length=898' Tc=55.8 min CN=71 Runoff=8.46 cfs 1.359 af
<b>Subcatchment 5:</b>	Runoff Area=388,972 sf 4.27% Impervious Runoff Depth>1.86" Flow Length=927' Tc=56.8 min CN=74 Runoff=8.60 cfs 1.381 af
<b>Link AP-1:</b>	Inflow=83.17 cfs 14.949 af Primary=83.17 cfs 14.949 af
<b>Link AP-2:</b>	Inflow=13.20 cfs 2.275 af Primary=13.20 cfs 2.275 af
<b>Link AP-3:</b>	Inflow=9.04 cfs 1.465 af Primary=9.04 cfs 1.465 af
<b>Link AP-4:</b>	Inflow=8.46 cfs 1.359 af Primary=8.46 cfs 1.359 af
<b>Link AP-5:</b>	Inflow=8.60 cfs 1.381 af Primary=8.60 cfs 1.381 af

**Total Runoff Area = 156.034 ac Runoff Volume = 21.430 af Average Runoff Depth = 1.65"**  
**99.38% Pervious = 155.064 ac 0.62% Impervious = 0.969 ac**

# Pre-Development

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Type III 24-hr 25-YR Rainfall=5.80"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 1:</b>	Runoff Area=4,797,455 sf 0.53% Impervious Runoff Depth>2.48" Flow Length=3,501' Tc=68.1 min CN=71 Runoff=127.77 cfs 22.723 af
<b>Subcatchment 2:</b>	Runoff Area=728,513 sf 0.00% Impervious Runoff Depth>2.48" Flow Length=1,237' Tc=63.3 min CN=71 Runoff=20.28 cfs 3.458 af
<b>Subcatchment 3:</b>	Runoff Area=448,250 sf 0.00% Impervious Runoff Depth>2.58" Flow Length=804' Tc=57.1 min CN=72 Runoff=13.73 cfs 2.208 af
<b>Subcatchment 4:</b>	Runoff Area=433,642 sf 0.00% Impervious Runoff Depth>2.49" Flow Length=898' Tc=55.8 min CN=71 Runoff=12.98 cfs 2.065 af
<b>Subcatchment 5:</b>	Runoff Area=388,972 sf 4.27% Impervious Runoff Depth>2.75" Flow Length=927' Tc=56.8 min CN=74 Runoff=12.80 cfs 2.050 af
<b>Link AP-1:</b>	Inflow=127.77 cfs 22.723 af Primary=127.77 cfs 22.723 af
<b>Link AP-2:</b>	Inflow=20.28 cfs 3.458 af Primary=20.28 cfs 3.458 af
<b>Link AP-3:</b>	Inflow=13.73 cfs 2.208 af Primary=13.73 cfs 2.208 af
<b>Link AP-4:</b>	Inflow=12.98 cfs 2.065 af Primary=12.98 cfs 2.065 af
<b>Link AP-5:</b>	Inflow=12.80 cfs 2.050 af Primary=12.80 cfs 2.050 af

**Total Runoff Area = 156.034 ac Runoff Volume = 32.503 af Average Runoff Depth = 2.50"**  
**99.38% Pervious = 155.064 ac 0.62% Impervious = 0.969 ac**

# Pre-Development

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Type III 24-hr 25-YR Rainfall=5.80"

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## Summary for Subcatchment 1:

Runoff = 127.77 cfs @ 12.94 hrs, Volume= 22.723 af, Depth> 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
3,878,180	70	Woods, Good, HSG C
577,483	74	Pasture/grassland/range, Good, HSG C
41,820	71	Meadow, non-grazed, HSG C
93,982	74	>75% Grass cover, Good, HSG C
* 180,361	72	(Tree Farm) Woods/grass comb., Good, HSG C
25,629	98	Paved parking, HSG A
4,797,455	71	Weighted Average
4,771,826		99.47% Pervious Area
25,629		0.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	150	0.0467	0.18		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
8.2	585	0.0291	1.19		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
45.6	2,766	0.0409	1.01		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
68.1	3,501	Total			

## Summary for Subcatchment 2:

Runoff = 20.28 cfs @ 12.87 hrs, Volume= 3.458 af, Depth> 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
626,006	70	Woods, Good, HSG C
94,154	74	Pasture/grassland/range, Good, HSG C
8,353	71	Meadow, non-grazed, HSG C
728,513	71	Weighted Average
728,513		100.00% Pervious Area

**Pre-Development**

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Type III 24-hr 25-YR Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0067	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
2.2	96	0.0208	0.72		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
6.6	437	0.0252	1.11		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
7.8	554	0.0560	1.18		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
63.3	1,237	Total			

**Summary for Subcatchment 3:**

Runoff = 13.73 cfs @ 12.78 hrs, Volume= 2.208 af, Depth&gt; 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
200,693	70	Woods, Good, HSG C
227,556	74	Pasture/grassland/range, Good, HSG C
20,001	71	Meadow, non-grazed, HSG C
448,250	72	Weighted Average
448,250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0067	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
8.0	385	0.0260	0.81		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.4	269	0.0706	1.86		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
57.1	804	Total			

**Summary for Subcatchment 4:**

Runoff = 12.98 cfs @ 12.78 hrs, Volume= 2.065 af, Depth&gt; 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
369,284	70	Woods, Good, HSG C
64,358	74	>75% Grass cover, Good, HSG C
433,642	71	Weighted Average
433,642		100.00% Pervious Area

**Pre-Development**

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Type III 24-hr 25-YR Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	150	0.0133	0.07		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
10.5	491	0.0244	0.78		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.8	257	0.0039	0.44		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
55.8	898	Total			

**Summary for Subcatchment 5:**

Runoff = 12.80 cfs @ 12.79 hrs, Volume= 2.050 af, Depth> 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
140,475	70	Woods, Good, HSG C
231,901	74	>75% Grass cover, Good, HSG C
* 16,596	98	Paved parking, HSG A
388,972	74	Weighted Average
372,376		95.73% Pervious Area
16,596		4.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0067	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
3.4	147	0.0204	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
6.7	630	0.0508	1.58		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
56.8	927	Total			

**Summary for Link AP-1:**

Inflow Area = 110.134 ac, 0.53% Impervious, Inflow Depth > 2.48" for 25-YR event  
 Inflow = 127.77 cfs @ 12.94 hrs, Volume= 22.723 af  
 Primary = 127.77 cfs @ 12.94 hrs, Volume= 22.723 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

**Summary for Link AP-2:**

Inflow Area = 16.724 ac, 0.00% Impervious, Inflow Depth > 2.48" for 25-YR event  
 Inflow = 20.28 cfs @ 12.87 hrs, Volume= 3.458 af  
 Primary = 20.28 cfs @ 12.87 hrs, Volume= 3.458 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

**Pre-Development**

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Type III 24-hr 25-YR Rainfall=5.80"

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**Summary for Link AP-3:**

Inflow Area = 10.290 ac, 0.00% Impervious, Inflow Depth > 2.58" for 25-YR event  
Inflow = 13.73 cfs @ 12.78 hrs, Volume= 2.208 af  
Primary = 13.73 cfs @ 12.78 hrs, Volume= 2.208 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

**Summary for Link AP-4:**

Inflow Area = 9.955 ac, 0.00% Impervious, Inflow Depth > 2.49" for 25-YR event  
Inflow = 12.98 cfs @ 12.78 hrs, Volume= 2.065 af  
Primary = 12.98 cfs @ 12.78 hrs, Volume= 2.065 af, Atten= 0%, Lag= 0.0 min

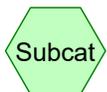
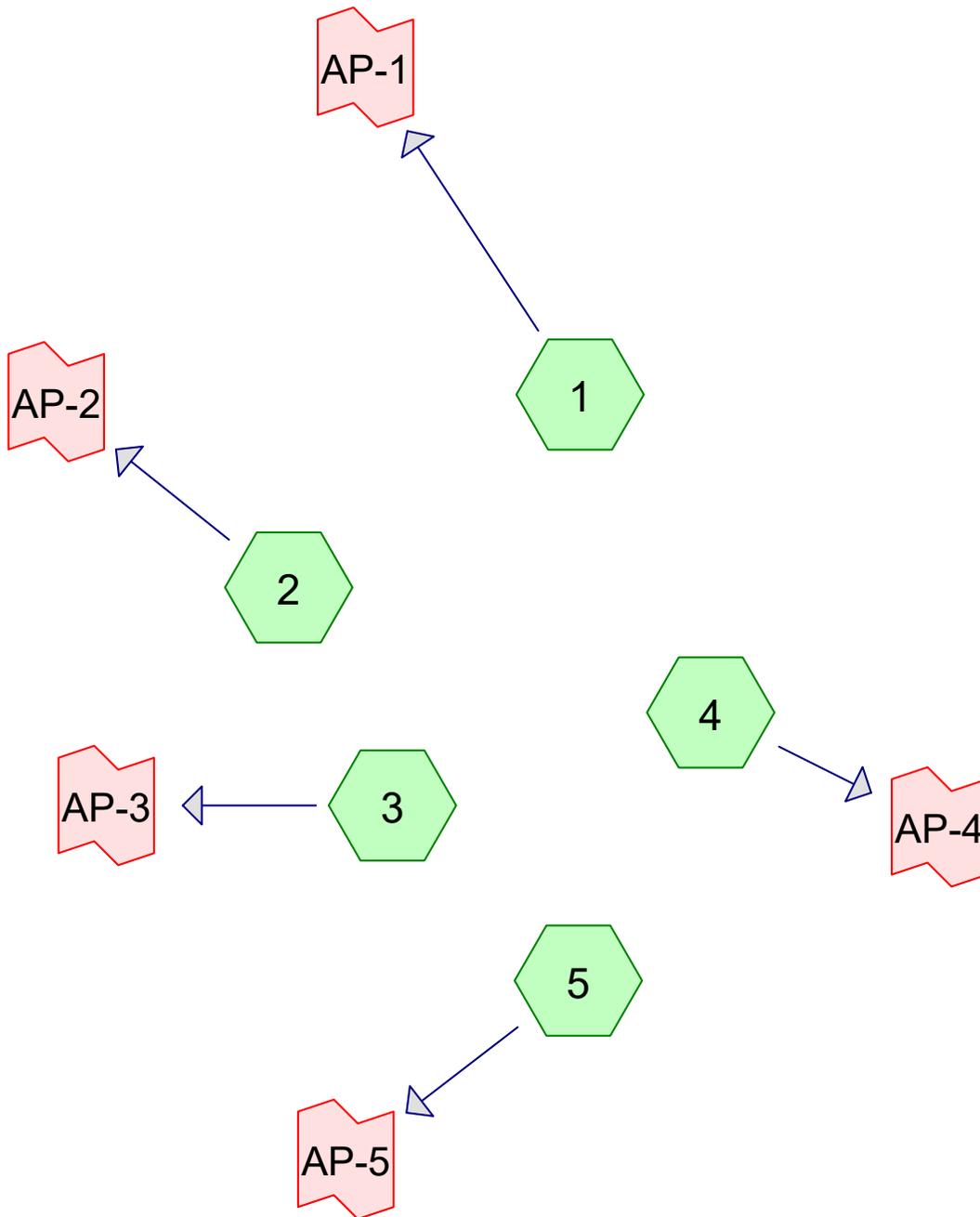
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

**Summary for Link AP-5:**

Inflow Area = 8.930 ac, 4.27% Impervious, Inflow Depth > 2.75" for 25-YR event  
Inflow = 12.80 cfs @ 12.79 hrs, Volume= 2.050 af  
Primary = 12.80 cfs @ 12.79 hrs, Volume= 2.050 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

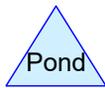
**Appendix C**  
**Post Development Calculations**



Subcat



Reach



Pond



Link

**Routing Diagram for Post-Development**  
 Prepared by Hewlett-Packard Company, Printed 7/13/2021  
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**Post-Development**

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Type III 24-hr 2-YR Rainfall=3.10"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1:** Runoff Area=4,797,455 sf 1.03% Impervious Runoff Depth>0.72"  
Flow Length=3,501' Tc=68.1 min CN=71 Runoff=34.22 cfs 6.572 af

**Subcatchment 2:** Runoff Area=728,513 sf 0.00% Impervious Runoff Depth>0.72"  
Flow Length=1,237' Tc=63.3 min CN=71 Runoff=5.44 cfs 1.001 af

**Subcatchment 3:** Runoff Area=448,250 sf 0.00% Impervious Runoff Depth>0.77"  
Flow Length=804' Tc=57.1 min CN=72 Runoff=3.85 cfs 0.658 af

**Subcatchment 4:** Runoff Area=433,642 sf 3.65% Impervious Runoff Depth>0.72"  
Flow Length=898' Tc=55.8 min CN=71 Runoff=3.50 cfs 0.598 af

**Subcatchment 5:** Runoff Area=388,972 sf 7.00% Impervious Runoff Depth>0.86"  
Flow Length=927' Tc=56.8 min CN=74 Runoff=3.86 cfs 0.643 af

**Link AP-1:** Inflow=34.22 cfs 6.572 af  
Primary=34.22 cfs 6.572 af

**Link AP-2:** Inflow=5.44 cfs 1.001 af  
Primary=5.44 cfs 1.001 af

**Link AP-3:** Inflow=3.85 cfs 0.658 af  
Primary=3.85 cfs 0.658 af

**Link AP-4:** Inflow=3.50 cfs 0.598 af  
Primary=3.50 cfs 0.598 af

**Link AP-5:** Inflow=3.86 cfs 0.643 af  
Primary=3.86 cfs 0.643 af

**Total Runoff Area = 156.034 ac Runoff Volume = 9.472 af Average Runoff Depth = 0.73"**  
**98.64% Pervious = 153.906 ac 1.36% Impervious = 2.128 ac**

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Type III 24-hr 10-YR Rainfall=4.60"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1:** Runoff Area=4,797,455 sf 1.03% Impervious Runoff Depth>1.63"  
Flow Length=3,501' Tc=68.1 min CN=71 Runoff=83.17 cfs 14.949 af

**Subcatchment 2:** Runoff Area=728,513 sf 0.00% Impervious Runoff Depth>1.63"  
Flow Length=1,237' Tc=63.3 min CN=71 Runoff=13.20 cfs 2.275 af

**Subcatchment 3:** Runoff Area=448,250 sf 0.00% Impervious Runoff Depth>1.71"  
Flow Length=804' Tc=57.1 min CN=72 Runoff=9.04 cfs 1.465 af

**Subcatchment 4:** Runoff Area=433,642 sf 3.65% Impervious Runoff Depth>1.64"  
Flow Length=898' Tc=55.8 min CN=71 Runoff=8.46 cfs 1.359 af

**Subcatchment 5:** Runoff Area=388,972 sf 7.00% Impervious Runoff Depth>1.86"  
Flow Length=927' Tc=56.8 min CN=74 Runoff=8.60 cfs 1.381 af

**Link AP-1:** Inflow=83.17 cfs 14.949 af  
Primary=83.17 cfs 14.949 af

**Link AP-2:** Inflow=13.20 cfs 2.275 af  
Primary=13.20 cfs 2.275 af

**Link AP-3:** Inflow=9.04 cfs 1.465 af  
Primary=9.04 cfs 1.465 af

**Link AP-4:** Inflow=8.46 cfs 1.359 af  
Primary=8.46 cfs 1.359 af

**Link AP-5:** Inflow=8.60 cfs 1.381 af  
Primary=8.60 cfs 1.381 af

**Total Runoff Area = 156.034 ac Runoff Volume = 21.430 af Average Runoff Depth = 1.65"**  
**98.64% Pervious = 153.906 ac 1.36% Impervious = 2.128 ac**

## Post-Development

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Type III 24-hr 25-YR Rainfall=5.80"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 1:</b>	Runoff Area=4,797,455 sf 1.03% Impervious Runoff Depth>2.48" Flow Length=3,501' Tc=68.1 min CN=71 Runoff=127.77 cfs 22.723 af
<b>Subcatchment 2:</b>	Runoff Area=728,513 sf 0.00% Impervious Runoff Depth>2.48" Flow Length=1,237' Tc=63.3 min CN=71 Runoff=20.28 cfs 3.458 af
<b>Subcatchment 3:</b>	Runoff Area=448,250 sf 0.00% Impervious Runoff Depth>2.58" Flow Length=804' Tc=57.1 min CN=72 Runoff=13.73 cfs 2.208 af
<b>Subcatchment 4:</b>	Runoff Area=433,642 sf 3.65% Impervious Runoff Depth>2.49" Flow Length=898' Tc=55.8 min CN=71 Runoff=12.98 cfs 2.065 af
<b>Subcatchment 5:</b>	Runoff Area=388,972 sf 7.00% Impervious Runoff Depth>2.75" Flow Length=927' Tc=56.8 min CN=74 Runoff=12.80 cfs 2.050 af
<b>Link AP-1:</b>	Inflow=127.77 cfs 22.723 af Primary=127.77 cfs 22.723 af
<b>Link AP-2:</b>	Inflow=20.28 cfs 3.458 af Primary=20.28 cfs 3.458 af
<b>Link AP-3:</b>	Inflow=13.73 cfs 2.208 af Primary=13.73 cfs 2.208 af
<b>Link AP-4:</b>	Inflow=12.98 cfs 2.065 af Primary=12.98 cfs 2.065 af
<b>Link AP-5:</b>	Inflow=12.80 cfs 2.050 af Primary=12.80 cfs 2.050 af

**Total Runoff Area = 156.034 ac Runoff Volume = 32.503 af Average Runoff Depth = 2.50"**  
**98.64% Pervious = 153.906 ac 1.36% Impervious = 2.128 ac**

**Post-Development**

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Type III 24-hr 25-YR Rainfall=5.80"

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**Summary for Subcatchment 1:**

Runoff = 127.77 cfs @ 12.94 hrs, Volume= 22.723 af, Depth&gt; 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
2,293,171	70	Woods, Good, HSG C
577,483	74	Pasture/grassland/range, Good, HSG C
1,602,840	71	Meadow, non-grazed, HSG C
93,982	74	>75% Grass cover, Good, HSG C
* 180,361	72	(Tree Farm) Woods/grass comb., Good, HSG C
49,006	98	Paved parking, HSG A
* 612	98	Pads/Posts
4,797,455	71	Weighted Average
4,747,837		98.97% Pervious Area
49,618		1.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	150	0.0467	0.18		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
8.2	585	0.0291	1.19		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
45.6	2,766	0.0409	1.01		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
68.1	3,501	Total			

**Summary for Subcatchment 2:**

Runoff = 20.28 cfs @ 12.87 hrs, Volume= 3.458 af, Depth&gt; 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
451,054	70	Woods, Good, HSG C
94,154	74	Pasture/grassland/range, Good, HSG C
183,297	71	Meadow, non-grazed, HSG C
* 8	98	Pads/Posts
728,513	71	Weighted Average
728,505		100.00% Pervious Area
8		0.00% Impervious Area

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Type III 24-hr 25-YR Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0067	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
2.2	96	0.0208	0.72		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
6.6	437	0.0252	1.11		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
7.8	554	0.0560	1.18		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
63.3	1,237	Total			

**Summary for Subcatchment 3:**

Runoff = 13.73 cfs @ 12.78 hrs, Volume= 2.208 af, Depth> 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
200,693	70	Woods, Good, HSG C
227,556	74	Pasture/grassland/range, Good, HSG C
20,001	71	Meadow, non-grazed, HSG C
448,250	72	Weighted Average
448,250		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0067	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
8.0	385	0.0260	0.81		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.4	269	0.0706	1.86		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
57.1	804	Total			

**Summary for Subcatchment 4:**

Runoff = 12.98 cfs @ 12.78 hrs, Volume= 2.065 af, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
353,440	70	Woods, Good, HSG C
64,358	71	Meadow, non-grazed, HSG C
15,844	98	Paved parking, HSG A
433,642	71	Weighted Average
417,798		96.35% Pervious Area
15,844		3.65% Impervious Area

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Type III 24-hr 25-YR Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5	150	0.0133	0.07		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
10.5	491	0.0244	0.78		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.8	257	0.0039	0.44		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
55.8	898	Total			

**Summary for Subcatchment 5:**

Runoff = 12.80 cfs @ 12.79 hrs, Volume= 2.050 af, Depth> 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
131,716	70	Woods, Good, HSG C
230,038	74	>75% Grass cover, Good, HSG C
27,218	98	Paved parking, HSG A
388,972	74	Weighted Average
361,754		93.00% Pervious Area
27,218		7.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	150	0.0067	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
3.4	147	0.0204	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
6.7	630	0.0508	1.58		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
56.8	927	Total			

**Summary for Link AP-1:**

Inflow Area = 110.134 ac, 1.03% Impervious, Inflow Depth > 2.48" for 25-YR event  
 Inflow = 127.77 cfs @ 12.94 hrs, Volume= 22.723 af  
 Primary = 127.77 cfs @ 12.94 hrs, Volume= 22.723 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

**Summary for Link AP-2:**

Inflow Area = 16.724 ac, 0.00% Impervious, Inflow Depth > 2.48" for 25-YR event  
 Inflow = 20.28 cfs @ 12.87 hrs, Volume= 3.458 af  
 Primary = 20.28 cfs @ 12.87 hrs, Volume= 3.458 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-YR Rainfall=5.80"

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**Summary for Link AP-3:**

Inflow Area = 10.290 ac, 0.00% Impervious, Inflow Depth > 2.58" for 25-YR event  
Inflow = 13.73 cfs @ 12.78 hrs, Volume= 2.208 af  
Primary = 13.73 cfs @ 12.78 hrs, Volume= 2.208 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

**Summary for Link AP-4:**

Inflow Area = 9.955 ac, 3.65% Impervious, Inflow Depth > 2.49" for 25-YR event  
Inflow = 12.98 cfs @ 12.78 hrs, Volume= 2.065 af  
Primary = 12.98 cfs @ 12.78 hrs, Volume= 2.065 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

**Summary for Link AP-5:**

Inflow Area = 8.930 ac, 7.00% Impervious, Inflow Depth > 2.75" for 25-YR event  
Inflow = 12.80 cfs @ 12.79 hrs, Volume= 2.050 af  
Primary = 12.80 cfs @ 12.79 hrs, Volume= 2.050 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

**Appendix D**  
**Treatment Calculations**

**Raymond Solar Project  
Water Quality Treatment Calculations  
(Linear Portion of Project)**

Road Width = 18 feet

Road ID	Start Station	End Station	BMP ID	Buffer Max. Slope (%)	Buffer Length (ft)	Impervious Area (sq. ft.)	Impervious Area Treated (sq. ft.)	Impervious Area Untreated (sq. ft.)	Cover Type	Soil Type	Buffer Length Required (ft)
Road 1	0+00	- 0+50	None			953		953		C, Sandy Loam	
Road 1	0+50	- 1+40	Buffer 1	7%	55	1,620	1,620	0	Forested	C, Sandy Loam	55
Road 1	1+40	- 2+85	None			2,610		2,610	Forested	C, Sandy Loam	100
Road 1	2+85	- 5+35	Turn Out 1	2%	100	4,500	4,500	0	Forested	C, Sandy Loam	100
Road 1*	5+35	- 7+85				5,868		5,868		C, Sandy Loam	
Road 1**	7+85	- 13+50	Buffer 2	11%	55	11,249	11,249	0	Forested	C, Sandy Loam	55
Road 1	13+50	- 16+00	Turn Out 2	4%	100	4,500	4,500	0	Forested	C, Sandy Loam	100
Road 1**	16+00	- 17+88	Turn Out 3	4%	120	3,892	3,892	0	Meadow	C, Sandy Loam	120
Road 1*	17+88	- 19+75	Turn Out 4	5%	120	5,792	5,792	0	Meadow	C, Sandy Loam	120
Road 1	19+75	- 21+63	Turn Out 5	5%	120	3,375	3,375	0	Meadow	C, Sandy Loam	120
Road 1*	21+63	- 23+50	Turn Out 6	7%	120	4,743	4,743	0	Meadow	C, Sandy Loam	120
Road 1	23+50	- 23+90	None	-		736		736		C, Sandy Loam	
<b>Totals</b>						<b>49,838</b>	<b>39,672</b>	<b>10,167</b>			

\*Includes hammerhead turnaround around area

\*\*Includes passing area

**Impervious Area Treatment Calculations (Linear project)**

Total Proposed Impervious Area=	49,838 sq. ft.	=	1.14 acres
Total Treated Proposed Impervious Area=	39,672 sq. ft.	=	0.91 acres
Total Untreated Proposed Impervious Area=	10,167 sq. ft.	=	0.23 acres
<b>Proposed Impervious Area Treatment %=</b>	<b>79.60 %</b>		

**Impervious Area Treatment Calculations (Non-Linear)**

Racking Posts Area=	50 sq. ft.
Fence Posts Area=	50 sq. ft.
Equipment Pad Area=	520 sq. ft.
<b>Proposed Non-Linear Impervious Treatment* %=</b>	<b>100.00 %</b>

\*Non-Linear areas considered self treated by meadow conditions underlying the solar panels

**Appendix E**  
**Template Buffer Deed Restrictions**



1. **Restrictions on Restricted Buffer Area.** Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.
  - a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;
  - b. Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:
    - (i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees" is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot rectangle (1,250 square feet) area, as determined by the rating scheme in Table 11:

**Table 11.  
Point System for Determining an Evenly  
Distributed Stand of Trees**

Diameter of tree at 4½ feet above ground level	Points
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

- (ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;
- c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors, or fence;
- d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;

- e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

- 2. **Enforcement.** The MDEP may enforce any of the Restrictions set forth in Section 1 above.
- 3. **Binding Effect.** The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.
- 4. **Amendment.** Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.
- 5. **Effective Provisions of Declaration.** Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.
- 6. **Severability.** Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.
- 7. **Governing Law.** This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

\_\_\_\_\_  
(NAME)

STATE OF MAINE \_\_\_\_\_ County, \_\_\_\_\_, 20\_\_.  
(County) (date)

Personally appeared before me the above named \_\_\_\_\_, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

\_\_\_\_\_  
Notary Public  
\_\_\_\_\_

1. MDEP RESTRICTIONS ON RESTRICTED BUFFER AREA (NON-WOODED MEADOW BUFFER). Pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection and Maine Department of Environmental Protection (“MDEP”) Permit # \_\_\_\_\_ (the “Permit”), that portion of the Property identified as the “Restricted Buffer Area” on Exhibit \_\_\_\_\_ is and shall be held, transferred, sold, conveyed, occupied and maintained subject to the following conditions and restrictions (together, the “Restrictions”) which may be enforced by the MDEP or any successor:

A. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped except as permitted under this Section \_\_\_\_\_. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the Permit issued to Tenant, the use of the Restricted Buffer Area is hereinafter limited as follows:

(i) No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way.

(ii) A dense cover of grassy vegetation must be maintained over the Restricted Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. The Restricted Buffer Area may not be maintained as a lawn or used as a pasture. If vegetation in the Restricted Buffer Area is mowed, it may be mown no more than two times per year.

(iii) No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for the solar facility and appurtenant equipment related thereto (including guys and guy anchors, solar panels, racks, support posts and other appurtenant equipment necessary for maintenance and operation of the solar facility), access roads serving the solar facility, signs, utility poles and fences (whether constructed of wood, steel or other materials).

(iv) No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area, except for vehicles used in mowing or vehicles used for installation or maintenance of the solar facility.

(v) Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

B. Notwithstanding anything herein to the contrary, the term of the Restrictions shall be as follows:

(i) The Restrictions shall apply to those portions of the Restricted Buffer Area which treat runoff from the access road(s) serving the solar facility; provided, however, that upon the removal and revegetation of an access road, the Restrictions applicable to those portions of the Restricted Buffer Area associated with such access road shall automatically terminate and be of no further force or effect, but the Restrictions applicable to those portions of the Restricted Buffer Area associated with any access road which has not been removed and revegetated shall remain in full force and effect until such time as such access road has been removed and revegetated. By way of illustration only, if the solar facility is served by access roads (or portions thereof) which lie both inside and outside of the fenced

area and Tenant removes and revegetates only the access roads (or portions thereof) lying inside of the fenced area, then the Restrictions applicable to those portions of the Restricted Buffer Area associated with the access roads (or portions thereof) lying inside of the fenced area shall automatically terminate and be of no further force or effect, but the Restrictions applicable to those portions of the Restricted Buffer Area associated with the access roads (or portions thereof) lying outside of the fenced area shall remain in full force and effect until such time as such access roads (or portions thereof) have been removed and revegetated.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of the Restrictions is prohibited except as expressly permitted hereunder. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

Any transfer of all or part of the Restricted Buffer Area shall contain a restriction in the deed or instrument for such transfer that the transfer is expressly subject to the Restrictions and all applicable terms and conditions of the Permit unless their removal or modification is approved by the MDEP, and recorded in the \_\_\_\_\_ County Registry of Deeds. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Restricted Buffer Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions.

Any transfer of any portion of the Property containing any part of the stormwater management system shall contain a restriction in the deed or instrument for such transfer that the transfer is expressly subject to all applicable terms and conditions of the Permit unless their removal or modification is approved by the MDEP, and recorded in the \_\_\_\_\_ County Registry of Deeds.

**Appendix F**  
**Checklist**



**DEPARTMENT OF ENVIRONMENTAL PROTECTION  
STORMWATER APPLICATION CHECKLIST**

<b>Applicant:</b>		
<b>Project Name:</b>		
<b>Town:</b>		
Application Type:	<input type="checkbox"/> Stormwater	<input type="checkbox"/> Site Law
Watershed Name:		
Watershed Type:	<input type="checkbox"/> UIS	<input type="checkbox"/> Phosphorus <input type="checkbox"/> Neither

**Project Area Information**

	Existing to Remain <sup>1</sup>	New / Proposed	Total
Impervious (Im)			
Landscaped (Land)			
Developed (Dev) <sup>2</sup>			

1- If area is not subject to treatment, provide reason and show in a separate column in the Water Quality Calc table.

2- Developed area = Impervious Area + Landscaped Area

**A. BASIC STANDARD**

**1. Erosion and Sedimentation Controls** (Appendix A, page 32 of Chapter 500:

<https://www.maine.gov/sos/cec/rules/06/096/096c500.docx> )

- Guidance in Department [ESC BMP Manuals](#)

**2. Inspection & Maintenance** (Appendix B, page 37 of Chapter 500)

Construction Phase: Show on Plans the following:

- Responsibility for inspection and maintenance
- Construction schedule (how long will it take and in what sequence/critical path to build)
- Inspection frequency
- Scope of inspection
- Inspector qualifications
- Define storm event that triggers a wet weather inspection (0.5” of rain in 24 hours)
- Documentation (3 years minimum)

Post-Construction: Include in written I&M Plan the following:

- Responsibility for inspection and maintenance
- Inspection frequency for each BMP
- Inspection form for each BMP
- Inspector qualifications
- Define storm event that triggers a wet weather inspection (1” of rain in 24 hours)
- Documentation (5 years, minimum)
- Project is subject to Department 5-Year Recertification

**3. Good Housekeeping** (Appendix C, page 41 of Chapter 500)

- Show all seven elements on Plans.

**B. GENERAL STANDARD**

**Must provide the following on WQ Treatment Plan:** All BMPs with subcatchments including time of concentration (Tc) lines, flow lengths and flow types.

**1. Soil Explorations** (test pit completed by a certified soil scientist) at each proposed BMP

- Include test pit summary table on detail plan.
- If there is potential ledge, address in design.
- If shallow groundwater, address in design.

**2. Treatment Standards** (modify to fit project): Fill out the following table for the applicable standards that apply.

Applicable Standard	Section in Ch. 500	Required Treatment (Im / Dev)	Area Eligible		Area Treated		Provided Treatment %	
			Im	Dev	Im	Dev	Im	Dev
General Standard	4(C)(2)(a)(i)	95% / 80%						
Increased Runoff Treated <sup>1</sup>	4(C)(2)(a)(ii)	90% / 80% min						
% Parcel Developed <sup>2</sup>	4(C)(2)(a)(iii)	90% / 75% min						
Redevelopment <sup>3</sup> (Dev Area)	4(C)(2)(d)	0% min (SW) 50% min (Site)						
Linear	4(C)(5)(c)	75% / 50% min						
Other: Offsite Treatment/Mitigation								
<b>Project Total Area =</b>								

1- If proposing to treat more than the first flush, state why meeting Ch. 500, § 4(C)(2)(a)(i) is not practicable.

2- Reduced % based on portion of parcel developed.

3- Include pollutant impact ranking calculations (current and proposed) and a figure showing the Redevelopment window.

**3. Proposed BMPs:** Please provide the following information on the Table below for EACH BMP.

BMPs Proposed	#	Pretreatment	Sizing cales	Detail on Plans <sup>1</sup>	CPV Draindown Time	HydroCAD

1- BMP details (cross sections, elevation sections, plan view)

Link to Stormwater Design BMP Volumes I, II, III

<https://www.maine.gov/dep/land/stormwater/stormwaterbmps/index.html>

- Provide Construction Oversight Notes.
- If BMP is unlined, review and satisfy (Appendix E Sections 4(b) and 4(c), page 50 of Chapter 500).
- Treatment buffers (Appendix F, page 56 of Chapter 500): must provide sample deed restriction (Appendix G, page 64 of Chapter 500).
- Infiltration must satisfy Appendix D, page 44 of Chapter 500.
- Is conveyance designed to a 10-year, 24-hour storm?
- Is a drainage easement required for any areas to be flooded?
- Discharge to a public storm sewer system: Must provide authorization from the authority.

If proposing Proprietary BMPs, provide:

- Letter from vendor approving sizing and siting  
<https://www.maine.gov/dep/land/stormwater/stormwaterbmps/index.html>.
- Executed 5-Year I&M Agreement with a provider approved by vendor.
- Narrative section and specific inspection forms in the written I&M Plan.
- Pervious pavement: Must provide Executed 5-Year I&M Agreement and vacuum equipment used.

### C. PHOSPHORUS STANDARD

**MUST provide on the WQ Treatment Plan:** BMPs with subcatchments including time of concentration (Tc) lines, flow lengths and flow types;

Provide export calculations clearly showing distinct BMPs: Phosphorus Table Calculations  
[Worksheet 4 july 2015.xlsx](#).

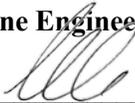
### D. FLOODING STANDARD

1. Add pre- and post- peak flow rates table to post development plan for storms (2-, 10-, 25-year).
2. Is primary access road passable up to a 25-year, 24-hour storm?
3. If requesting a waiver of the Flooding Standard, must state justification for the waiver.
4. HydroCad or other runoff model
  - If post peak flow rate is > pre-peak flow, a waiver request will be needed with justification Ch. 500, § 4(F)(3)(a) or (b),
  - If discharging to wetland see Chap. 500, § 4(I).

*This checklist has been designed by DEP stormwater engineers as a guidance tool to assist applicants and their consultants when preparing stormwater applications. Completing the checklist is recommended and valuable, but it is not a substitute for reviewing Ch. 500, and completing all the items on the checklist does not automatically mean all the Ch. 500 requirements have been satisfied. The contents of Ch. 500 should be reviewed carefully for the applicable requirements that apply to your proposed project.*

I have reviewed this checklist and included in my submission all the required elements of this checklist that apply to the proposed project.

**Maine Engineer of Record:**



\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name (print)

**EROSION AND SEDIMENTATION CONTROL  
INSPECTION AND MAINTENANCE PLAN**

**RAYMOND SOLAR PROJECT  
Raymond, Maine**

**Submitted by  
BWC Lake Flordia, LLC**

A Subsidiary of

**BLUEWAVE**

Prepared by:



Date:  
**July 2021**

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**LIST OF APPENDICES**

APPENDIX A	Plans
APPENDIX B	Construction Inspection Forms
APPENDIX C	Post-Construction Inspection Forms
APPENDIX D	Inspection Frequency Checklist and Long-Term Inspection & Maintenance Plan
APPENDIX E	Five-Year Recertification for Long-Term Maintenance of Stormwater Management Systems

## **1.0 INTRODUCTION**

The intent of this plan is to establish inspection and maintenance procedures to be implemented for erosion and sedimentation control best management practices (BMP's) during construction, as well as for post-construction stormwater BMP's, for the Raymond Solar Project. This plan has been prepared in conformance with the requirements set forth in 06-096 Chapter 500 – Stormwater Management and the General Permit – Construction Activity – Maine Pollutant Discharge Elimination System (Maine Construction General Permit).

## **1.1 PROJECT DESCRIPTION**

BWC Lake Floria, LLC is proposing the development and operation of a solar energy generation facility located in Raymond, Maine. The proposed Raymond Solar Project (the Project) will be located on Tax Map 10 Lots 87A & 88. The parcels are located on the north side of Webbs Mill Road (Route 85).

The scope of work includes but is not limited to:

- Tree clearing
- Stump and boulder removal
- Construction of 18-ft wide gravel access roads and passing areas
- Construction of project equipment pads
- Construction of a temporary staging areas
- Installation of solar panels and associated support equipment and structures
- Installation of buried and overhead collector lines

Construction of the project will be planned to occur incrementally in blocks of no more than 10-acres. Sequencing of construction will be structured so that the 10-acre blocks will be stabilized prior to commencing construction of subsequent 10-acre blocks.

The Project will employ temporary erosion and sedimentation control BMP's during construction and permanent stormwater management BMP's for post-construction operations. Refer to the Appendix A for supporting plans, details and narratives for erosion and sedimentation control and post-construction stormwater management BMP's.

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## 1.2 **REQUIRED PERMITS**

The following is a list of Municipal, State, and Federal permits that are required for the Project:

Municipal

Town of Raymond Site Plan Permit

State of Maine

Site Location of Development Act Permit

Federal

None

## 1.3 **REFERENCES**

This plan has been developed in accordance with the following:

- Stormwater Management Law 38 M.R.S. §420-C and §420-D  
<http://legislature.maine.gov/statutes/38/title38sec420-C.html>  
<http://legislature.maine.gov/statutes/38/title38sec420-D.html>
- 06-096 Chapter 500 – Stormwater Management  
<http://www.maine.gov/sos/cec/rules/06/096/096c500.docx>
- General Permit – Construction Activity  
Maine Pollutant Discharge Elimination System (MPDES)  
<https://www.maine.gov/dep/land/stormwater/construction.html>
- Maine Erosion and Sediment Control Best Management Practices (BMPs)  
Manual for Designers and Engineers  
[https://www.maine.gov/dep/land/erosion/escbmeps/esc\\_bmp\\_engineers.pdf](https://www.maine.gov/dep/land/erosion/escbmeps/esc_bmp_engineers.pdf)
- Maine Erosion and Sediment Control Practices Field Guide for Contractors  
[https://www.maine.gov/dep/land/erosion/escbmeps/esc\\_bmp\\_field.pdf](https://www.maine.gov/dep/land/erosion/escbmeps/esc_bmp_field.pdf)
- MaineDOT Best Management Practices for Erosion and Sedimentation Control  
<https://www.maine.gov/mdot/env/documents/bmp/BMP2008full.pdf>



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## 1.5 INSPECTION AND MAINTENANCE – DURING CONSTRUCTION

Anyone who conducts or directs an activity that involves exposing, filling or displacing soil or other earthen materials should take appropriate measures to prevent erosion and the loss of sediment beyond the project site or into a sensitive resource. Erosion and sediment control measures should be in place before the activity begins and should remain functional until the site is permanently stabilized. All measures should remain effective until all areas are permanently stabilized. Any disturbed area should be regularly inspected until the site is fully stabilized with either 90% grass cover or a permanent impervious surface such as pavement. A person who has the knowledge of erosion and sediment control measures and of stormwater management practices should inspect the site at a minimum once a week, and before and after a storm event. Any failing measure should be repaired or modified to adequately stabilize the site prior to the next storm event or no later than 7 calendar days. The inspection frequency table found in Appendix D shall be used as a guide for inspecting each specific BMP. The inspection form found in Appendix B shall be used to record the inspection, its outcome, and the required maintenance.

Refer to the Plans found in Appendix A for additional erosion and sediment control details and narratives.

### General Inspection, Maintenance, and Documentation Requirements

1. Inspection and corrective action: Inspect disturbed and impervious areas, erosion control measures, and material storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.
2. Maintenance: If BMP's need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event. All measures must be maintained in effective operating condition until areas are permanently stabilized.
3. Documentation: Maintain a binder with construction inspection forms summarizing the inspections and any corrective action taken. The forms must include the name and qualifications of the person making the inspections, the date of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicle access points to the parcel. Refer to Appendix B for the construction inspection form. Major observations must include BMP's that need maintenance, BMP's that failed to

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operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the inspection form what corrective action taken and when it was taken. The Owner shall retain a copy of the inspection forms for a period of at least five years from the completion of permanent stabilization.

### Site-Specific BMP's

Refer to Appendix D for inspection and maintenance requirements and frequencies of site-specific BMP's. Refer to the Plans found in Appendix A for narratives and details of the site-specific BMP's. The following is a list of the site-specific BMP's that may be required for the project:

- Sedimentation Barriers (Silt Fence or Erosions Control Mix Berm)
- Stabilized Construction Entrance
- Staging Area
- Construction Limit Barrier Fence
- Slope Stabilization
- Concrete Washout Structure
- Stone Check Dam
- Water Bar
- Level Spreader/Ditch Turnout
- Pumped Discharge Sediment Control Device "Dirt Bag"
- Temporary Sediment Traps and basin
- Pipe Outlet Protection
- Temporary Grass/Stone Lined Swale

### Winter Construction

Winter construction is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.

1. Site Stabilization: For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that have been brought to final grade must be stabilized. Mulch may not be spread on top of snow.
2. Sediment Barriers: All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers.

3. Ditches: All vegetated ditch lines that have not been stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by Maine DEP.
4. Slopes: Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

Refer to the Plans contained in Appendix A for additional winter construction erosion and sediment control requirements.

## **1.6 INSPECTION AND MAINTENANCE – POST-CONSTRUCTION**

The long-term operation and maintenance of a stormwater management system is as critical to its performance as its design and construction. Proper operation and maintenance practices ensure that stormwater BMP's continue to improve water quality by removing pollutants effectively over the long-term and decreasing the risk of re-suspending sediment. Without proper maintenance, BMPs are likely to fail and will no longer provide treatment of stormwater. The following includes a summary of the inspection, maintenance, and documentation requirements for post-construction stormwater BMP's.

Refer to the Plans contained in Appendix A for details and locations of site-specific post-construction BMP's.

### General Inspection, Maintenance, and Documentation Requirements

1. Inspection and maintenance: All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site.
  - a) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after significant rainfall events (1.0 inches in 24-hour period) to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.
  - b) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after significant rainfall events (0.5 inches in 24-hour period) to remove any obstructions to flow, remove accumulated sediments and debris,

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to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.

- c) Inspect resource and treatment buffers once a year for evidence of erosion, concentrating flow, and encroachment by development. If flows are concentrating within a buffer, site grading, level spreaders, or ditch turn-outs must be used to ensure a more even distribution of flow into a buffer. Check down slope of all level spreaders and turn-outs for erosion. If erosion is present, adjust or modify the level spreader's or turn-out's lip to ensure a better distribution of flow into a buffer. Clean-out any accumulation of sediment within the level spreader bays or turn-out pools.
- d) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

## 2. Regular maintenance

- a) Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.
- b) Manage each buffer's vegetation consistently with the requirements in any deed restrictions for the buffer. Wooded buffers must remain fully wooded and have no disturbance to the duff layer. Vegetation in non-wooded meadow

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buffers may not be mowed more than two times per year, and may not be cut shorter than six inches.

3. Documentation: Maintain a binder of inspection forms summarizing inspection, maintenance, and any corrective actions taken. The inspection forms must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. Refer to Appendix C for inspection forms. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed of after removal. The log must be made accessible to MEDEP staff and a copy provided to the MEDEP upon request. The Owner shall retain a copy of the logs for a period of at least five years from the completion of permanent stabilization.
4. The site-specific post-construction BMP's for the Raymond Solar Project include the following:
  - Buffers
  - Storm Drain System (including culverts, storm drains, catch basins, drain manholes, and vegetated and reinforced ditches/swales)

Buffer Areas: In addition to the roadside buffers shown on the Project Plans, the areas within the solar array field will be maintained as meadow buffers. The solar array meadow buffers shall be inspected and maintained in a similar manner to the roadside buffers including but not limited to mowing of the buffer area not more than twice per year.

## **1.7 RECERTIFICATION OF STORMWATER MANAGEMENT SYSTEMS**

All projects permitted under Stormwater Management Law since 2005 require reporting every 5 years. Certification must be sent to the MEDEP within three months of the expiration of each five-year interval from the date of issuance of the permit stating that the stormwater management system has been inspected, maintained, and repaired (if needed). The standard form for “Five-Year Recertification for Long-Term Maintenance of Stormwater Management Systems” is contained in Appendix E. The general inspection and maintenance requirements include but are not limited to the following:

1. Identification and repair of erosion problems: All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
2. Inspection and repair of stormwater control system: All aspects of the

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stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.

3. Maintenance: The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the MEDEP, and the maintenance log is being maintained.

Note: Municipalities with separate storm sewer systems regulated under the Maine Pollutant Discharge Elimination System (MPDES) Program may report on all regulated systems under their control as part of their required annual reporting in lieu of separate certification of each system. Municipalities not regulated by the MPDES Program, but that are responsible for maintenance of permitted stormwater systems, may report on multiple stormwater systems in one report.

## **1.8 HOUSEKEEPING**

The following performance standards shall apply:

1. Spill prevention: Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop and implement as necessary appropriate spill prevention, containment, and response planning measures.

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NOTE: Any spill or release of toxic or hazardous substances must be reported to the Department. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department's website at :

<http://www.maine.gov/dep/spills/emergspillresp/>

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2. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

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See 06-096 Chapter 500 - Appendix D for license by rule standards for infiltration of stormwater.

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NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

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3. Fugitive sediment and dust: Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately, no less than once a week, and prior to significant storm events. Operations during dry months that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

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NOTE: Take care in sourcing water. Dewatering a stream without a permit from the Department may violate state water quality standards and the *Natural Resources Protection Act*.

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4. Debris and other materials: Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

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NOTE: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

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5. Excavation de-watering: Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.

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NOTE: Dewatering controls are discussed in the “Maine Erosion and Sediment Control BMPs, Maine Department of Environmental Protection.”

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6. Authorized Non-stormwater discharges: Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:
  - a) Discharges from firefighting activity;
  - b) Fire hydrant flushings;
  - c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
  - d) Dust control runoff in accordance with permit conditions;
  - e) Routine external building washdown, not including surface paint removal, that does not involve detergents;
  - f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
  - g) Uncontaminated air conditioning or compressor condensate;
  - h) Uncontaminated groundwater or spring water;
  - i) Foundation or footer drain-water where flows are not contaminated;
  - j) Uncontaminated excavation dewatering;
  - k) Potable water sources including waterline flushings; and
  - l) Landscape irrigation.
  
7. Unauthorized non-stormwater discharges: The Department’s approval under this Chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with 06-096 Chapter 500 - Appendix C (6). Specifically, the Department’s approval does not authorize discharges of the following:
  - a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
  - b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
  - c) Soaps, solvents, or detergents used in vehicle and equipment washing; and
  - d) Toxic or hazardous substances from a spill or other release.
  
8. Additional requirements: Additional requirements may be applied on a site-specific basis.

**Appendix A**  
**Plans**

**Appendix B**  
**Construction Inspection Forms**

CONSTRUCTION INSPECTION FORM FOR EROSION AND SEDIMENT CONTROL					
General Information:					
Site Name:	Date:	Inspected by:			
Owner:					
Retained 3PI:	Last Rain Date:	Amount:			
Reason for Inspection:	Weekly	Winter	Final	Rain Event	Complaint
Description of disturbed area:					
Photos:					
	YES/NO/NA	COMMENTS			
1. Is an Erosion and Sediment Control Plan available?					
ESC plan on-site and followed					
Other:					
2. Are all erosion control practices installed properly, maintained and functioning?					
Disturbed areas stable					
Concentrated flow inlet/outlet protection					
All areas at final grade					
Disturbed dormant areas stabilized					
Access roads and parking					
Hillsides and stockpiles					
Other:					
3. Are all sedimentation control practices installed properly, maintained and functioning?					
Construction entrance					
Sedimentation basins/traps/diversions					
Perimeter controls					
Check dams					
Other:					
4. Is maintenance of ESC measures, construction activities and housekeeping kept-up?					
Sedimentation/erosion in ditches					
Tracked Sediment or dust at exits					
Hazardous material storage and spill control practices					
Waste management (concrete, hazardous material, etc.)					
Other:					
5. Violation, Corrective Actions, Recommendations					
Sediment discharged from site?					
Corrective action required?					
Site compliant with all permits?					
Notice of violation or stop work order issued?					
Comments/Corrective Actions (complete corrective actions before the next rain event and within 7 day)					

**Appendix C**  
**Post-Construction Inspection Forms**

**Raymond Solar Project  
Post-Construction Inspection Form (Buffers/Level Spreaders)**

Project name:	Date:	Inspected by:
---------------	-------	---------------

Owner name:

Last rain date:	Amount:
-----------------	---------

Reason for inspection:	Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
------------------------	------------	---------	----------	------------------	-----------------

General description of BMP condition/recent maintenance performed:

Photos: (Attach)

<b>Inspection Details</b>	<b>Comments</b>	<b>Maintenance Required</b>
Erosion or concentrated flows evident?		
Downgradient of level spreaders stable?		
Level spreaders built along contour?		
Evidence of accumulated sediment in level spreader trough?		
Number of level spreaders adequate for flow distribution?		
Buffer monumentation visible?		
Evidence of buffer vegetation removal or frequent mowing?		
Temporary or permanent structures within the buffer?		
Evidence of motorized vehicles operating in buffer?		
Trash, debris, or waste within buffer area?		

Additional Comments:

**Raymond Solar Project  
Post-Construction Inspection Form (Ditches, Swales and Open Stormwater Channels)**

Project name:	Date:	Inspected by:
---------------	-------	---------------

Owner name:

Last rain date:	Amount:
-----------------	---------

Reason for inspection:	Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
------------------------	------------	---------	----------	------------------	-----------------

General description of BMP condition/recent maintenance performed:

Photos: (Attach)

Inspection Details	Comments	Maintenance Required
Obstructions, sediment or debris noticeable in ditch line?		
Mowing required?		
Woody vegetation apparent in ditches?		
Side slopes stable? Signs of slumping?		
Rip rap stable? Underlying filter fabric visible?		

Additional Comments:

**Raymond Solar Project  
Post-Construction Inspection Form (Roadway and Parking Areas)**

Project name:	Date:	Inspected by:
---------------	-------	---------------

Owner name:

Last rain date:	Amount:
-----------------	---------

Reason for inspection:	Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
------------------------	------------	---------	----------	------------------	-----------------

General description of BMP condition/recent maintenance performed:

Photos: (Attach)

Inspection Details	Comments	Maintenance Required
Winter sand accumulation apparent?		
Pavement Sweeping required?		
Gravel shoulders graded appropriately?		
Gravel road grading required?		
Low spots causing puddling?		

Additional Comments:

**Raymond Solar Project**  
**Post-Construction Inspection Form (Storm Drain System including culverts)**

Project name:	Date:	Inspected by:
---------------	-------	---------------

Owner name:

Last rain date:	Amount:
-----------------	---------

Reason for inspection:	Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
------------------------	------------	---------	----------	------------------	-----------------

General description of BMP condition/recent maintenance performed:

Photos: (Attach)

Inspection Details	Comments	Maintenance Required
Accumulated debris or sediment at inlet, outlet, or within culvert/storm drain?		
Flow obstructions present?		
Erosion apparent at culvert inlet/outlet?		

Additional Comments:

**Raymond Solar Project  
Post-Construction Inspection Form (Vegetated Area)**

Project name:	Date:	Inspected by:
---------------	-------	---------------

Owner name:

Last rain date:	Amount:
-----------------	---------

Reason for inspection:	Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
------------------------	------------	---------	----------	------------------	-----------------

General description of BMP condition/recent maintenance performed:

Photos: (Attach)

Inspection Details	Comments	Maintenance Required
All slopes and embankments well vegetated? Signs of sparse growth?		
Rill erosion apparent in vegetated areas?		
Downs slope of level spreaders/ditch turnouts stable?		
Mowing of vegetated areas appropriate?		

Additional Comments:



EROSION AND SEDIMENT CONTROL MEASURES AND ACTIVITY	INSPECTION FREQUENCY		
	Weekly	Before and After a Storm	After Construction
<b>SEDIMENT BARRIERS</b>			
Sediment barriers are installed prior to soil disturbances	X	X	
Silt fences are keyed in and tight	X	X	
Barriers are repaired and replaced as necessary	X	X	
Barriers are removed when the site is stabilized - Silt fence should be cut at the ground surface			X
<b>TEMPORARY STABILIZATION</b>			
Areas are stabilized if idle for 14 days or more	X	X	
Daily stabilization within 100 ft of a natural resource	X	X	
<b>MULCH</b>			
Seed and mulch within 7 days of final grading. Ground is not visible	X	X	
Erosion control mix is 4-6 inch thick	X	X	
Erosion control blankets or hay mulch are anchored	X	X	
<b>VEGETATION</b>			
Vegetation provides 90% soil cover	X		X
Loam or soil amendment were provided	X		X
New seeded areas are mulched and protected from vehicle, foot traffic and runoff	X	X	X
Areas that will remain unworked for more than 1 year are vegetated with grass	X		
<b>SLOPES AND EMBANKMENTS</b>			
Final graded slopes and embankments are stabilized	X	X	X
Diversions are provided for areas with rill erosion	X	X	X
Areas steeper than 2:1 are riprapped	X		
Stones are angular, durable and various in size	X		
Riprap is underlain with a gravel layer or filter fabric	X		
<b>STORMWATER CHANNELS AND CULVERTS</b>			
Ditches and swales are permanently stabilized—channels that will be riprapped have been over-excavated	X	X	X
Ditches are clear of obstructions, accumulated sediments or debris	X	X	X
Ditch lining/bottoms are free of erosion	X	X	X
Check dams are spaced correctly to slow flow velocity	X		
Underlying filter fabric or gravel is not visible	X	X	X
Culvert aprons and plunge pools are sized for expected flows volume and velocity	X		
Stones are angular, durable and various in size	X		
Culverts are sized to avoid upgradient flooding	X	X	
Culvert protection extends to the maximum flow elevation within the ditch	X	X	X
Culvert is embedded, not hanging	X	X	X

<b>ROADWAYS AND PARKING SURFACES</b>			
The gravel pad at the construction entrance is clear from sediments	X	X	
Roads are graded to drain		X	X
Cross drainage (culvert) is provided	X		
False ditches (from winter sand) are graded		X	X
<b>BUFFERS</b>			
Buffers are free of erosion or concentrated flows		X	X
The downgradient of spreaders and turnouts is stable		X	X
Level spreaders are on the contour			X
The number of spreaders and ditch turnouts is adequate for flow distribution		X	X
Any sediment accumulation is removed from within spreader or turnouts		X	X
<b>WINTER CONSTRUCTION (November 1<sup>st</sup>-April15th)</b>			
Final graded areas are mulched daily at twice the normal rate with hay, and anchor (not on snow)	Daily		
A double row of sediment barrier is provided for all areas within 100 ft of a sensitive resource (use erosion control mix on frozen ground)	Daily		
Newly constructed ditches are ripped	Daily		
Slopes greater than 8% are covered with an erosion control blanket or a 4-inch layer of erosion control mix	Daily		
<b>HOUSEKEEPING PUNCH LIST</b>			
All disturbed areas are permanently stabilized, and plantings are established (grass seeds have germinated with 90% vegetative cover)			X
All trash, sediments, debris or any solid waste have been removed from stormwater channels, catch basins, detention structures, discharge points, etc.			X
All ESC devices have been removed: (silt fence and posts, diversions and sediment structures, etc.)			X
All deliverables (certifications, survey information, as-built plans, reports, notice of termination (NOT), etc.) in accordance with all permit requirements have been submitted to town, Maine DEP, association, owner, etc.			X

## INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES (BMPS)

	INSPECTION SCHEDULE	CORRECTIVE ACTIONS
<b>VEGETATED AREAS</b>	Annually early spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
<b>DITCHES, SWALES AND OPEN STORMWATER CHANNELS</b>	Annually spring and late fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge
<b>CULVERTS</b>	Spring and late fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
<b>ROADWAYS AND PARKING AREAS</b>	Annually in the spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean out the sediment within water bars or open-top culverts
<b>RESOURCE AND TREATMENT BUFFERS</b>	Annually in the spring	Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
		Inspect buffers for evidence of erosion, concentrated flow, or encroachment by development
		Manage the buffer's vegetation with the requirements in any deed restrictions
		Repair any sign of erosion within a buffer
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Install more level spreaders, or ditch turn-outs if needed for a better distribution of flow
<b>OTHER PRACTICES</b>	As specified for devices	Clean out any accumulation of sediment within the spreader bays or turnout pools
		Mow non-wooded buffers no shorter than six inches and less than three times per year
		Contact the department for appropriate inspection and maintenance requirements for other drainage control and runoff treatment measures.

**Five-Year Recertification for Long-Term Maintenance of Stormwater Management Systems**

**Appendix E**

## FIVE-YEAR RECERTIFICATION FOR LONG-TERM MAINTENANCE OF STORMWATER MANAGEMENT SYSTEMS

For Site Location & Stormwater Projects

This form complies with the condition that requires reporting every 5 years on the long-term maintenance of stormwater management structures of projects permitted under the Stormwater Management Law since 2005. Complete the following sections, include inspection photos, and use additional paper if needed. A copy of the report if the inspection was performed by a professional experienced in BMP maintenance should be included. Electronic copy of this form and information about the five-year recertification are available on the Maine DEP website at: <http://www.maine.gov/dep/land/stormwater/stormwaterbmps/>

Please type or print in black ink only			
Owner/Licensee		3rd Party Inspection Company (if applicable)	
<b>Name of Representative:</b>		<b>Name of Inspector or preparer of report:</b>	
<b>Company:</b>		<b>Company:</b>	
<b>Mailing Address:</b>		<b>Mailing Address:</b>	
<b>Daytime Phone #:</b>		<b>Daytime Phone #:</b>	
<b>E-mail Address:</b>		<b>E-mail Address:</b>	

LOCATION OF DEVELOPMENT			
<b>Name of Project:</b>			
<b>Address and Town:</b>			
<b>DEP Permit Number:</b>		<b>Year of Permit:</b>	

PROJECT SPECIFICS	
If the project is unfinished, please describe its current status and your plans for the future. The filing of this report of on-site long-term maintenance activities is still required.	
If the project is within a MPDES Regulated Town, the maintenance report prepared for the town should be submitted with this form.	
If the project is a subdivision with a Homeowner's association, identify the responsible party.	
Confirm that the required recording of deed restrictions for the protection of buffers or conservation land has been done, and that the buffers are maintained according to the restrictions.	
Identify the contractor for the required renewal of a 5-year maintenance contract for the inspection, cleaning and maintenance of manufactured proprietary structures.	
Is a maintenance log available for review?	

**LONG-TERM MAINTENANCE (please comment on the following):**

All areas of the development have been inspected for erosion, and appropriate steps have been taken to permanently stabilize these areas.

All stormwater control structures have been inspected for damage, wear, malfunction, and appropriate steps have been taken to repair or replace the failing systems.

The erosion control and stormwater maintenance plan for the site is being implemented as written, and a maintenance log has been created and is being maintained.

**CERTIFICATIONS/SIGNATURES**

**By signing below, the owner (or authorized agent) certifies that all stormwater management structures at the project described above are stable and operational as designed.**

Signed: \_\_\_\_\_ Title \_\_\_\_\_ Date: \_\_\_\_\_

This completed form and all supporting documents summarized above shall be sent to the following address. An emailed report is appropriate and should be sent to [Recert-DEP@maine.gov](mailto:Recert-DEP@maine.gov)

Five-year Recertification  
Bureau of Land Resources  
17 State House Station  
Augusta, ME 04333  
Tel: (207) 287-2624 or (207) 287-2602

**EXHIBIT I**

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**Decommissioning Plan**

# EXHIBIT I: DECOMMISSIONING PLAN & FINANCIAL ASSURANCE

## Decommissioning Overview

The Project will be decommissioned at the end of its operational life or at the expiration/termination of the land lease agreement. The land lease agreement is expected to last 40 years, with an initial 20-year lease and then a tenant option to renew for four consecutive five-year periods. Decommissioning will be completed within six months of the end of its operational life or expiration/termination of the lease agreement. BWC Lake Floria, LLC will be responsible for Project decommissioning including removal of the solar energy generation facility and all associated waste from the Site. Waste will be transported by licensed transporters and recycled or disposed of in accordance with applicable local, state, and federal regulations. General decommissioning activities include:

- Physical removal of all project components including solar panels, racking structures, foundations, electrical equipment, interconnection equipment, utility poles, and fencing.
- Disposal of all solid waste from the Site and from decommissioning activities in accordance with applicable local, State, and Federal waste disposal regulations.
- Restoration of the Site including grading, stabilization, seeding and re-vegetation as necessary to minimize erosion and runoff.

## Decommissioning Process

The decommissioning tasks listed in Table 1 will occur in a sequential order. A final decommissioning plan will be prepared by a qualified engineer prior to decommissioning activities.

**Table 1: Decommissioning Tasks**

Task Description
1. Remove racking
2. Remove solar panels
3. Dismantle racks
4. Remove electrical equipment
5. Break up and remove concrete pads
6. Remove racks
7. Remove racking foundations and poles
8. Remove fence
9. Grading
10. Seed disturbed area
11. Truck to recycling center

## Equipment Removal and Site Restoration

Wiring and cables associated with racking aboveground and underground to a depth of two feet or less will be removed. Underground wiring that is buried deeper than two feet will be abandoned in place. Other electrical equipment mounted on structures and pads will be detached and transported to a designated facility for recycling or reuse. This includes transformers, inverters, and switchgear.

After wiring and cables are removed, solar panels will be detached and transported to an appropriate facility for recycling or reuse. Above grade racking parts will be removed using tools and small machinery. Racking posts will be removed from the ground or cut off at a depth of at least two feet below grade, with remaining material left in place. Racking posts will be transported to a recycling facility.

When necessary, site restoration will take place to minimize erosion and runoff. Restoration will include regrading, mulching, seeding, and re-vegetating. Minimal ground disturbance is anticipated from removing racking posts. Disturbed areas will be re-seeded with the same conservation seed mix used across the Site during the life of the Project.

## Decommissioning Cost Estimate

A cost estimate for Project decommissioning is provided in Table 2 by task. The total estimated cost is \$150,199, based on information available from the New York State Energy Research and Development Authority (NYSERDA). The decommissioning cost estimate will be updated, every five years, by BWC Lake Floria, LLC, or its successor. A detailed decommissioning plan will be prepared by a qualified engineer prior to decommissioning.

**Table 2. Decommissioning Cost Estimate by Task.**

Task	Task Description	Estimated Cost
1	Remove racking	\$ 6,113
2	Remove solar panels	\$ 6,113
3	Dismantle racks	\$ 30,813
4	Remove electrical equipment	\$ 4,616
5	Break up and remove concrete pads	\$ 3,743
6	Remove racks	\$ 19,461
7	Remove racking foundations and poles	\$ 50,773
8	Remove fence	\$ 12,350
9	Grading	\$ 9,980
10	Seed disturbed area	\$ 624
11	Truck to recycling center	\$ 5,614
<b>Total Cost</b>		<b>\$150,199</b>

## Financial Assurance

As required under the Maine Department of Environmental Protection (MDEP) Site Location of Development Act application, the Project will provide financial assurance documents demonstrating fully funded decommissioning costs prior to Project construction. BWC Lake Floria, LLC will fully fund decommissioning of the Project at an estimated cost of \$150,199. Financial Assurance will be demonstrated through a performance bond, surety bond, irrevocable letter of credit, or other form acceptable to MDEP. A copy of the form of surety will be provided to the Town of Raymond prior to the issuance of the building permit.

## EXHIBIT J

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# Visual Assessment Summary



## MEMORANDUM

To: Dale Knapp, BRI Environmental  
From: Michael J. Buscher, T.J. Boyle Associates  
Date: June 2, 2021  
Re: Raymond Solar Project – Visual Review

### I. Introduction

T. J. Boyle Associates, LLC (“TJBA”), a landscape architecture and planning firm located in Burlington, Vermont, was retained to evaluate potential visual impacts due to the proposed Raymond Solar Project (the “Project”). The Project is a proposed 4.99 megawatt (AC) photovoltaic generation facility located northeast of Route 85 (Webbs Mills Road) in East Raymond, ME.

The proposed Project will be located on undeveloped land approximately 1,360 feet northeast of Route 85, and the array area will occupy approximately 27 acres. An existing transmission line located immediately south of the Project traverses the landscape in a roughly east-west direction. Site access will be via a new roadway that extends from Route 85 north to the Project area. The Project components will include solar photovoltaic (PV) panels, single-axis tracker racking systems and centralized equipment pads for converting the direct current (DC) electricity from the panels into alternating current (AC) for delivery to the existing electric transmission grid. The Project will also include underground and above-ground electrical lines, perimeter fencing, and access road connecting south to Route 85.



Figure 1 – Proposed Array Layout

The general arrangement of the Project and context of the area is illustrated in Figure 1.

## II. Viewshed Analysis

To help understand potential visibility of the proposed Project from the surrounding area, a viewshed was created using geographic information system (GIS) software. The viewshed was prepared using a digital elevation model and a digital surface model derived from LiDAR data, both of which have a resolution of one (1) square meter. The analysis applies a line-of-sight method from prescribed points representing the Project (the top of the proposed solar trackers) to all other locations within a three-mile buffer (the 3-mile study area), and shows how vegetation, buildings and other obstructions in the landscape may block views of the Project.

The resulting viewshed was overlaid with topographic information, roadway data, and scenic resource data and is provided as Appendix 1, Vegetated Viewshed and Scenic Resources Map. Based on the GIS viewshed analysis, a preponderance of Project visibility is concentrated within the Project clearing. There is an area of limited visibility immediately south of the Project where the existing transmission line passes in close proximity to the proposed Project clearing. A detailed inspection of the viewshed also shows potential visibility to the northwest of the Project on the east-facing slopes of Rattlesnake Mountain, a distance of over 2 miles away. No other areas on the viewshed map show significant expected visibility of the proposed solar array, and thus there are very limited ‘purple’ areas on the map indicating Project visibility.

## III. Scenic Resources Inventory

The viewshed analysis incorporates several datasets of potential scenic resources, as listed below. Many of these datasets did not have a presence within the 3-mile study area; those that did are shown on the Appendix 1 Vegetated Viewshed and Scenic Resources Map.

- National Natural Landmarks
- Focus Areas of Statewide Ecological Significance
- Maine Ecological Reserves
- Wildlife Management Areas
- Maine Eligible Historic Properties
- National Historic Points and Polygons
- Scenic Byways and Rivers
- Maine’s Finest Lakes
- Boat Launches
- Conservation Lands
- Statewide Trails, including the Appalachian and White Mountain National Forest Trails

## IV. Field Investigation and Evaluation of Visibility

A field investigation was undertaken to document potential visibility of the Project from the surrounding area. During the field review, it was observed that the potential visibility indicated on the viewshed map is very accurate, and potential visibility is either highly limited or not possible due to intervening vegetation, buildings and landform that surrounds the site and exists along nearby roadways. Two publicly accessible areas with potential visibility were observed within the entire 3-mile study area: Route 85 near the proposed Project access road, and the Bri-Mar Trail that ascends Rattlesnake Mountain to the northwest. A third location, Crescent Beach, is located immediately outside of the 3-mile study area at the northwestern extent of Crescent Lake, and was included in the field investigation due to the proximity to the 3-mile study area boundary and the potential for visibility from a public recreational resource. An analysis of the areas with potential visibility is provided below.

### **A. Route 85 (Webbs Mills Road)**

Route 85 is located approximately 1,400' southwest of the proposed array, and connects Route 11 to the northwest with Route 121 to the south. Route 85 is characterized by forested hillsides, agricultural fields and low-density residential uses to either side of the road. Jordan-Small Middle School and Raymond Elementary School are located approximately 0.8 miles southeast of the Project.

When heading northwest on Route 85, roadside clearing for residential lots allows more open views toward the Project than other locations along Route 85 (see Viewpoints 1 through 3). As can be seen in Viewpoints 2 and 3, an existing transmission line and associated conductors located on the south side of the proposed array is partially visible. The array is located approximately 300' or more to the north side of the existing transmission line. Due to the relatively low profile of the array structures and intervening vegetation and buildings between the road and the Project, significant visibility of the proposed array structures is not expected from Route 85 between Viewpoints 1 and 3, or at other locations along the roadway as it traverses through the landscape.

### **B. Bri-Mar Trail**

Beginning just over two miles northwest of the proposed array, the the Bri-Mar Trail<sup>1</sup> begins at a trail head on the west side of Route 85 and ascends Rattlesnake Mountain via posted private property. The trail offers a relatively short and moderately difficult route to the top, an elevation gain of approximately 625 feet. Rattlesnake Mountain is almost completely wooded, with a few overlooks along the southeastern ridge where vegetation is managed to allow for occasional views to the southeast. The largest overlook, approximately 1/10<sup>th</sup> of a mile from the peak, is approximately 2.2m miles northwest of the Project, and offers the only unobstructed view to the southeast (see Viewpoint 4). From this location, an expansive view is possible that overlooks the southern portion of Crescent Lake and most of Panther Pond. In addition to the lakes, many manmade elements are also visible, including residential structures and tree clearings, as well as several telecommunications towers visible both nearby and on the horizon.

To understand potential visibility of the proposed array from the overlook, a wireframe of the proposed clearing and remaining tree line was created and overlaid on the photograph for Viewpoint 4 using data derived from LiDAR (see Viewpoint 4B). The wireframe was then removed, which allows for an understanding of how much of the proposed clearing will be visible from the overlook (see Viewpoint 4C).

As can be seen in Viewpoint 4C, a portion of the proposed array will be visible from the overlook. It should be noted that the Bri-Mar Trail and associated overlook were identified by desktop analysis of potential areas with visibility, and the trail is not included in any of the statewide GIS data used for this analysis, including historic properties, conservation lands, state trails, or other landmarks as noted in the scenic resources section above.

### **C. Crescent Beach**

Crescent Beach<sup>2</sup> is one of two public beaches in the Town of Casco, and is located at the northwestern extent of Crescent Lake, just outside of the 3-mile study area. During desktop and field review, it was noted that the Project may have limited visibility from the beach due to the orientation of the lake and the westward slope of the landform under the Project site. Although the beach is outside of the 3-mile study area, the site was inventoried during the field visit for further analysis (see Viewpoint 5).

Similar to the review of visibility from the Bri-Mar Trail overlook, a wireframe of the proposed clearing and remaining tree line was created and overlaid on the photograph for Viewpoint 5 using data derived from

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<sup>1</sup> <https://www.alltrails.com/trail/us/maine/rattlesnake-mountain>

<sup>2</sup> <https://cascomaine.org/recreation.htm>

LiDAR (see Viewpoint 5B). The wireframe was then removed, which allows for an understanding of how much of the proposed clearing will be visible from the overlook (see Viewpoint 5C).

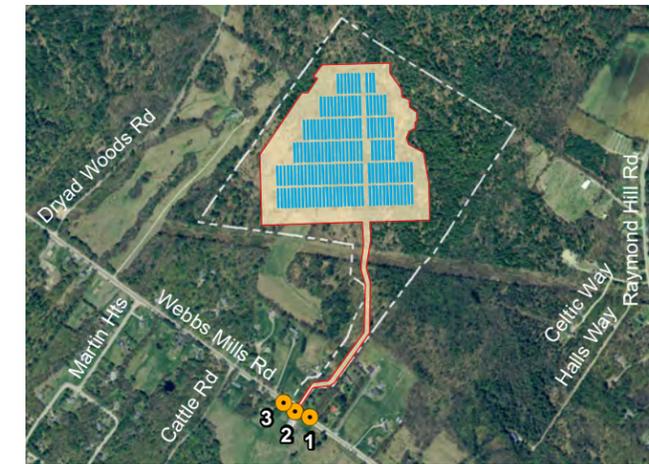
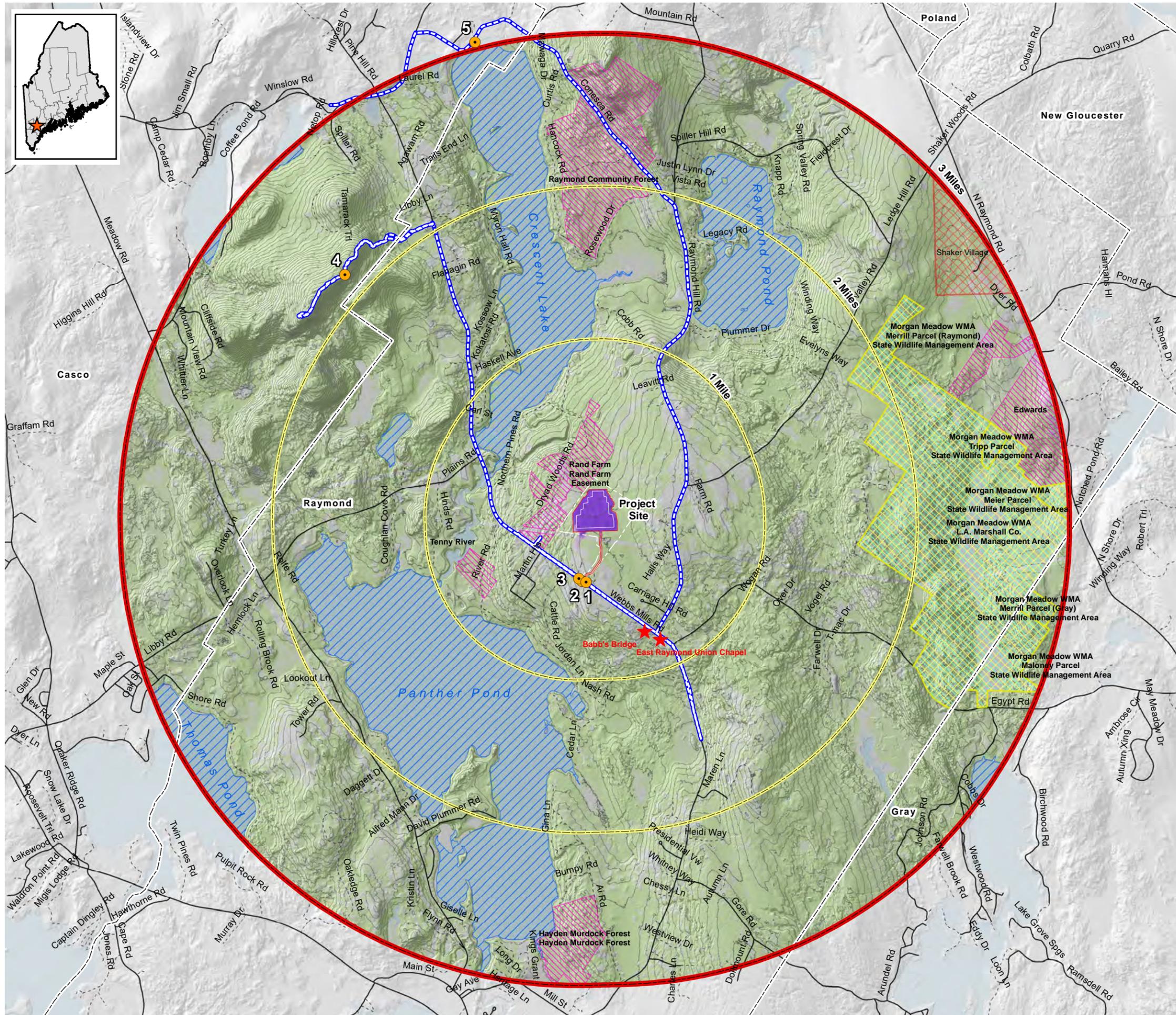
Based on the wireframe analysis, the proposed array is not expected to be visible from Crescent Beach due to existing vegetation between the Project and Crescent Lake.

#### **D. Other Surrounding Scenic Resources, Roads and Public Areas**

Visibility from other roads and locations in the study area is highly limited or not possible due to intervening vegetation and/or landform, including views from Raymond Hill Road, Babb's Bridge, East Raymond Union Chapel, Jordan-Small Middle School, Raymond Elementary School, and other surrounding locations.

### **V. Conclusion**

Based on the results of the viewshed analysis and field investigation, the vast majority of the 3-mile study area will not have visibility of the proposed Project. Only one location (the overlook on the Bri-Mar Trail) will have visibility of the proposed array. Like most other elevated locations, many manmade elements are currently visible from this overlook, including buildings, clearings, and communications towers. Additionally, the Bri-Mar Trail and associated overlook is not included in any of the statewide GIS data used for this analysis, including historic properties, conservation lands, state trails, or other landmarks. Other publicly accessible locations within 3-miles of the Project, including along Route 85 near the Project access, will not have significant visibility of the proposed array due to intervening vegetation, buildings and landform.



SITE MAP

# Raymond Solar

## Appendix A

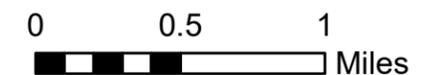
### VEGETATED VIEWSHED & SCENIC RESOURCE MAP

[ 3-Mile Study Area ]

June 2021

#### LEGEND

- Viewpoint Location
- Inventory Route
- National Historic Places
- 1-Mile Radius Rings
- 3-Mile Study Area
- State Conserved Land
- Private Conserved Land
- Maine's Finest Lakes
- National Historic Properties
- Wildlife Management Areas
- Obstructions (Canopy, Buildings)
- Roads
- Private Roads
- Visibility within Non-Forested Areas
  - High Low



GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

Elevation data derived from LiDAR data and/or the National Elevation Dataset.



***Viewpoint 1:*** Approximately 180° panoramic view from the Route 85, panning from northwest (left) to southeast (right). The orange rectangle represents the image below, which is captured with a 50mm normal lens equivalent.



***Viewpoint 1:*** View from Route 85 near the proposed access road, looking north toward the Project site. No visibility expected due to intervening vegetation and buildings. (50mm equivalent)



***Viewpoint 2:*** Approximately 180° panoramic view from Route 85, panning from northwest (left) to southeast (right). The orange rectangle represents the image below, which is captured with a 50mm normal lens equivalent.



***Viewpoint 2:*** View from Route 85 looking north toward the Project site. Although the existing transmission line conductors are partially visible through vegetation, no significant Project visibility is expected due to intervening vegetation, buildings and landform. (50mm equivalent)



***Viewpoint 3:*** Approximately 180° panoramic view from Route 85, panning from northwest (left) to southeast (right). The orange rectangle represents the image below, which is captured with a 50mm normal lens equivalent.



***Viewpoint 3:*** View from Route 85 looking north toward the Project site. Although the existing transmission line conductors are partially visible through vegetation, no significant Project visibility is expected due to intervening vegetation, buildings and landform. (50mm equivalent)



***Viewpoint 4:*** Approximately 180° panoramic view from the overlook on the Bri-Mar Trail, panning from northeast (left) to southwest (right). The orange rectangle represents the image below, which is captured with a 50mm normal lens equivalent.



***Viewpoint 4A:*** View from the overlook on the Bri-Mar Trail looking southeast toward the Project site. Several residential homes, tree clearings and communications towers are visible in the landscape from this vantage point. (50mm equivalent)



***Viewpoint 4B:*** View from the overlook on the Bri-Mar Trail looking southeast toward the Project site. A wireframe model of the tree canopy remaining around the Project and proposed clearing was created using LiDAR to understand potential Project visibility. (50mm equivalent)



***Viewpoint 4C:*** View from the overlook on the Bri-Mar Trail looking southeast toward the Project site. The wireframe shown in Viewpoint 4B is removed, showing the approximate visible cleared area in beige. Other areas of vegetation management/clearing, telecommunications towers and buildings are visible from this location. (50mm equivalent)



***Viewpoint 5:*** Approximately 180° panoramic view from Crescent Beach in Casco, panning from northeast (left) to southwest (right). The orange rectangle represents the image below, which is captured with a 50mm normal lens equivalent.



***Viewpoint 5A:*** Existing view from Crescent Beach looking southeast toward the Project site. (50mm equivalent)



***Viewpoint 5B:*** View from Crescent Beach looking southeast toward the Project site. A wireframe model of the tree canopy remaining around the Project and proposed clearing was created using LiDAR to understand potential Project visibility. (50mm equivalent)



***Viewpoint 5C:*** Cropped enlargement of the view from Crescent Beach looking southeast toward the Project site. The foreground tree line (red) at the northwestern edge of the proposed clearing (yellow) will, along with other foreground vegetation, completely screen the array.

**EXHIBIT K**

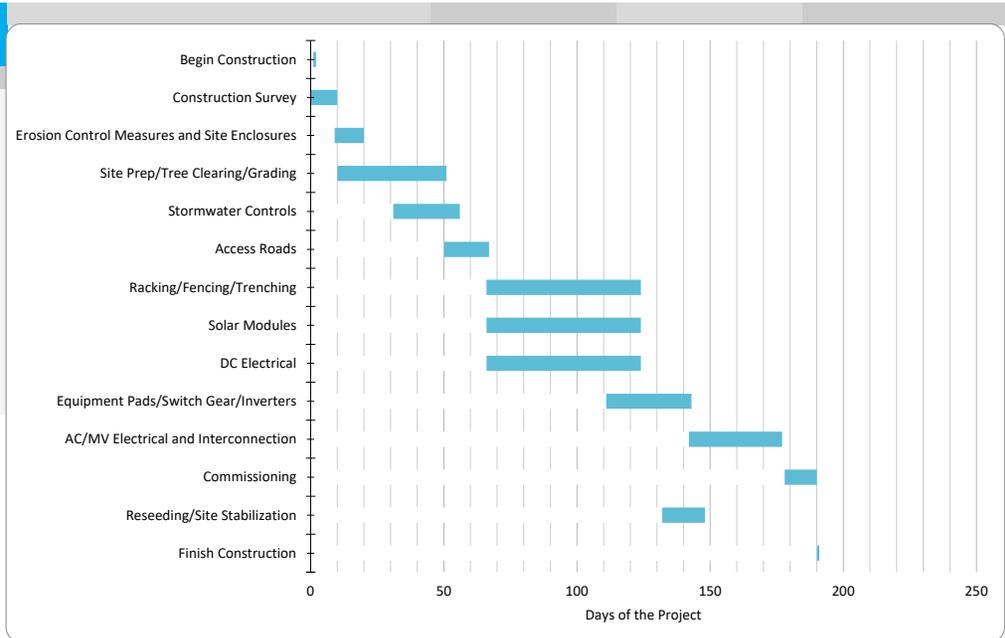
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**Construction Schedule**

# Solar Project Construction Schedule

Raymond, Maine Solar Project

TASK NAME	START DATE	END DATE	START ON DAY*	DURATION* (WORK DAYS)
<b>Solar Project Construction Schedule</b>				
Begin Construction	7/1/2022	7/1/2022	1	1
Construction Survey	7/1/2022	7/10/2022	0	10
Erosion Control Measures and Site Enclosures	7/10/2022	7/20/2022	9	11
Site Prep/Tree Clearing/Grading	7/11/2022	8/20/2022	10	41
Stormwater Controls	8/1/2022	8/25/2022	31	25
Access Roads	8/20/2022	9/5/2022	50	17
Racking/Fencing/Trenching	9/5/2022	11/1/2022	66	58
Solar Modules	9/5/2022	11/1/2022	66	58
DC Electrical	9/5/2022	11/1/2022	66	58
Equipment Pads/Switch Gear/Inverters	10/20/2022	11/20/2022	111	32
AC/MV Electrical and Interconnection	11/20/2022	12/24/2022	142	35
Commissioning	12/26/2022	1/6/2023	178	12
Reseeding/Site Stabilization	11/10/2022	11/25/2022	132	16
Finish Construction	1/7/2023	1/7/2023	190	1



**EXHIBIT L**

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**Performance Guarantee Statement**

# BLUEWAVE

BWC Lake Floria, LLC

## Performance Guarantee Requirement Statement

BWC Lake Floria, LLC, an entity wholly owned by BlueWave, is proposing the development of the Raymond Solar Project (Project), a distributed generation solar energy facility. Biodiversity Research Institute, Inc. (BRI) has been engaged as the lead consultant to support the Project. This statement is being submitted as part of the Town of Raymond Site Plan Application. Please accept the following statement as intent to file a performance guarantee when needed:

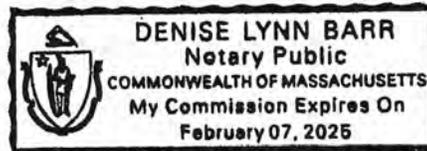
BWC Lake Floria, LLC will file a performance guarantee in a form of a certified check, performance bond, irrevocable letter of credit or some form of surety that is acceptable to the Town Manager, at the amount set by the Town Manager, prior to the issuance of Final Approval. The amount will cover required improvements such as public and private roads, all drainage structures and ditches, all erosion control measures, all utilities, all landscaping and all recreation facilities.

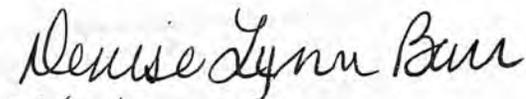
  
Signature

MARK D. SYLVIA  
Name

Authorized Signatory  
Title

7/9/2021  
Date



  
7/9/2021

## EXHIBIT M

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# Road Construction and Maintenance Responsibility Statement

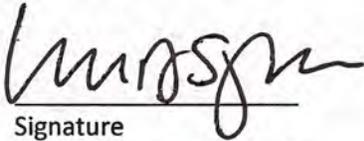
# BLUEWAVE

## BWC Lake Floria, LLC

### Road Construction and Maintenance Responsibility Statement

BWC Lake Floria, LLC, an entity wholly owned by BlueWave, is proposing the development of the Raymond Solar Project (Project), a distributed generation solar energy facility. Biodiversity Research Institute, Inc. (BRI) has been engaged as the lead consultant to support the Project. This statement is being submitted as part of the Town of Raymond Site Plan Application and as a supporting document for the Proposed Private Roadway Application. As per the Town of Raymond Street Ordinance requirement responsibility for street maintenance has been assigned as follows:

BWC Lake Floria, LLC, upon issuance of Final Approval, will take full responsibility of the proposed private road. BWC Lake Floria, LLC will be responsible for construction of the road, in addition to ongoing summer and winter maintenance, such as snowplowing and grading, stormwater buffer maintenance, long-term improvements, and emergency repairs. BWC Lake Floria, LLC has committed to providing a Performance Guarantee for the Project that includes the proposed private road.



Signature

MARK D. SYLVIA

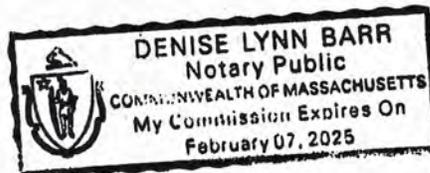
Name

Authorized Signatory

Title

7/9/2021

Date



*Denise Lynn Barr*  
7/9/2021