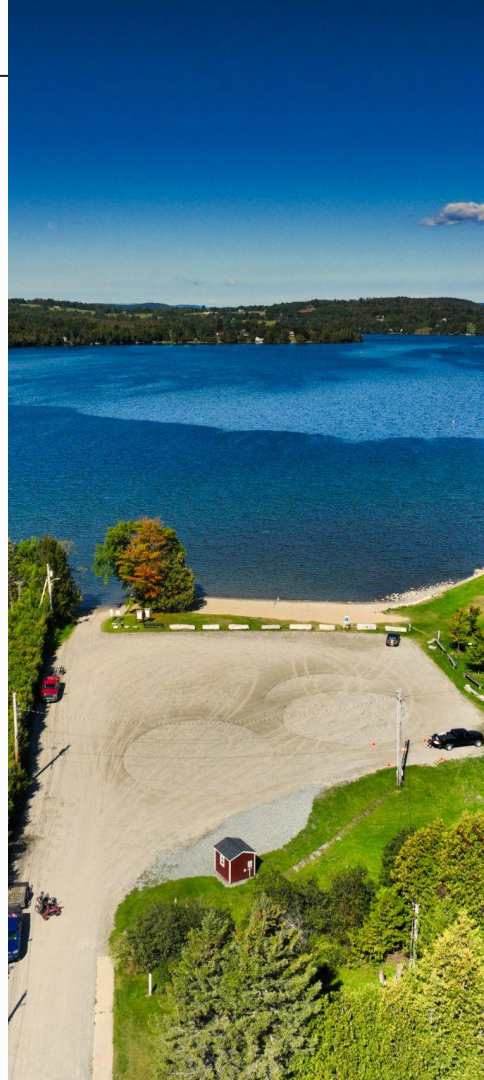
Caspian Beach Clean Water Project

A Presentation to the Hardwick Select Board

Thursday, April 16th, 2026

Presented by Will Marlier, Orleans County NRCD Staff

Orleans County Natural Resources Conservation District



Contents

What is a Clean Water Project?

"State of Vermont clean water funds target projects that reduce nutrient and sediment pollution across various land use sectors. These projects - applied across the landscape - result in nutrient and sediment pollution reductions necessary for surface waters to meet State of Vermont water quality standards."

- State of Vermont Clean Water Projects

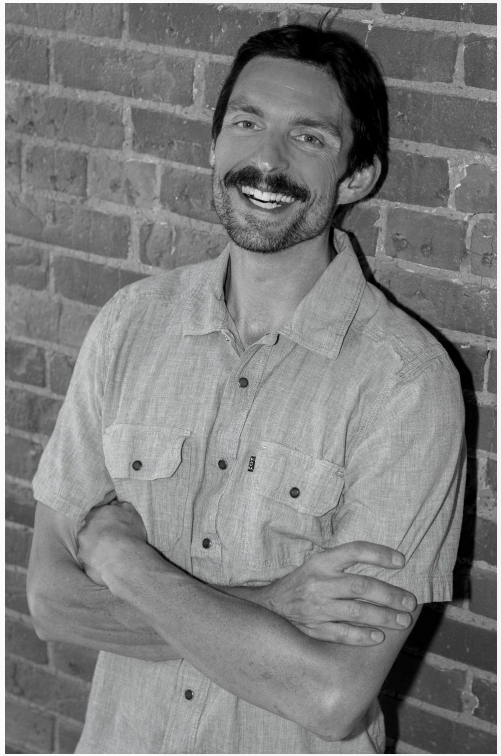
Meet The Team

Will Marlier

OCNRCD Lake Watershed Program Specialist

Will Marlier, a Greensboro resident since 2020, began his career working in environmental policy at the Vermont State House.

He transitioned to his more field-based position working on Orleans County's lakes in 2025, and has hit the ground running with a wide portfolio of restoration projects.



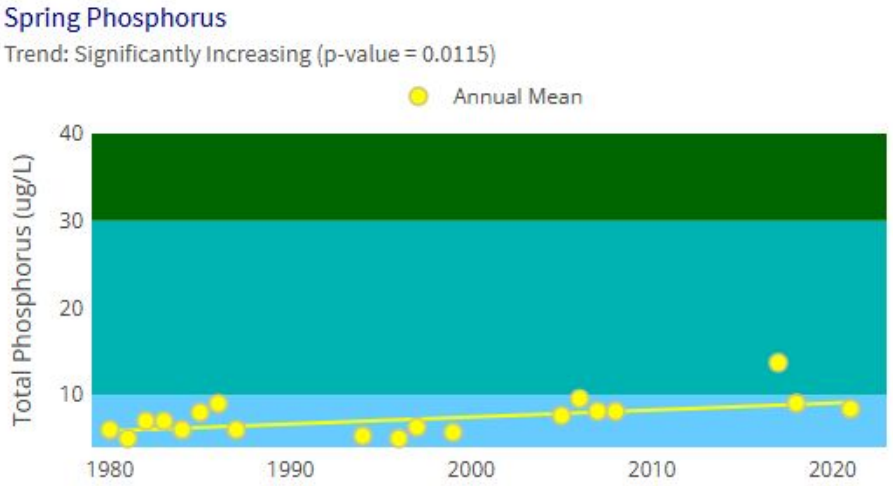
Dana Allen

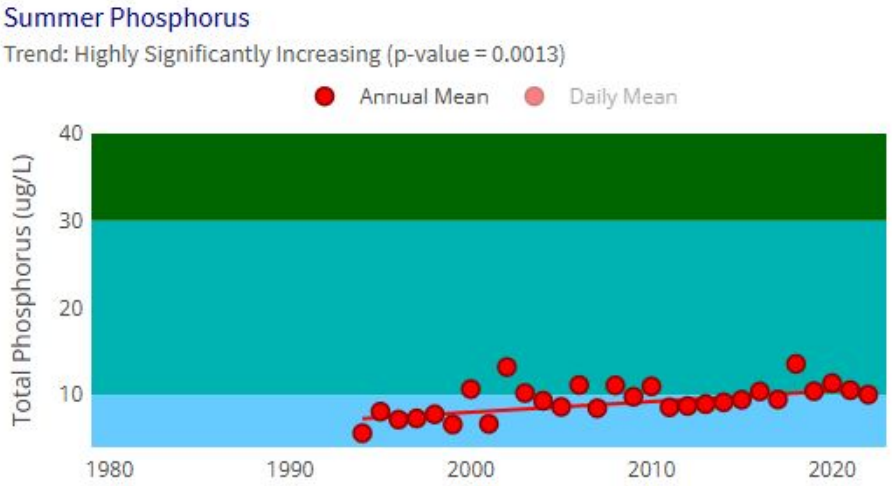
FluidState Consulting Principal

Dana Allen, FluidState's Principal, has nearly a decade of academic and consulting experience with water quality issues and stormwater in Vermont and elsewhere.

He has worked extensively in the Caspian Lake watershed, and was the chief designer of the 2023 Lake Watershed Action Plan for Caspian.

Phosphorus Loading & Caspian Lake



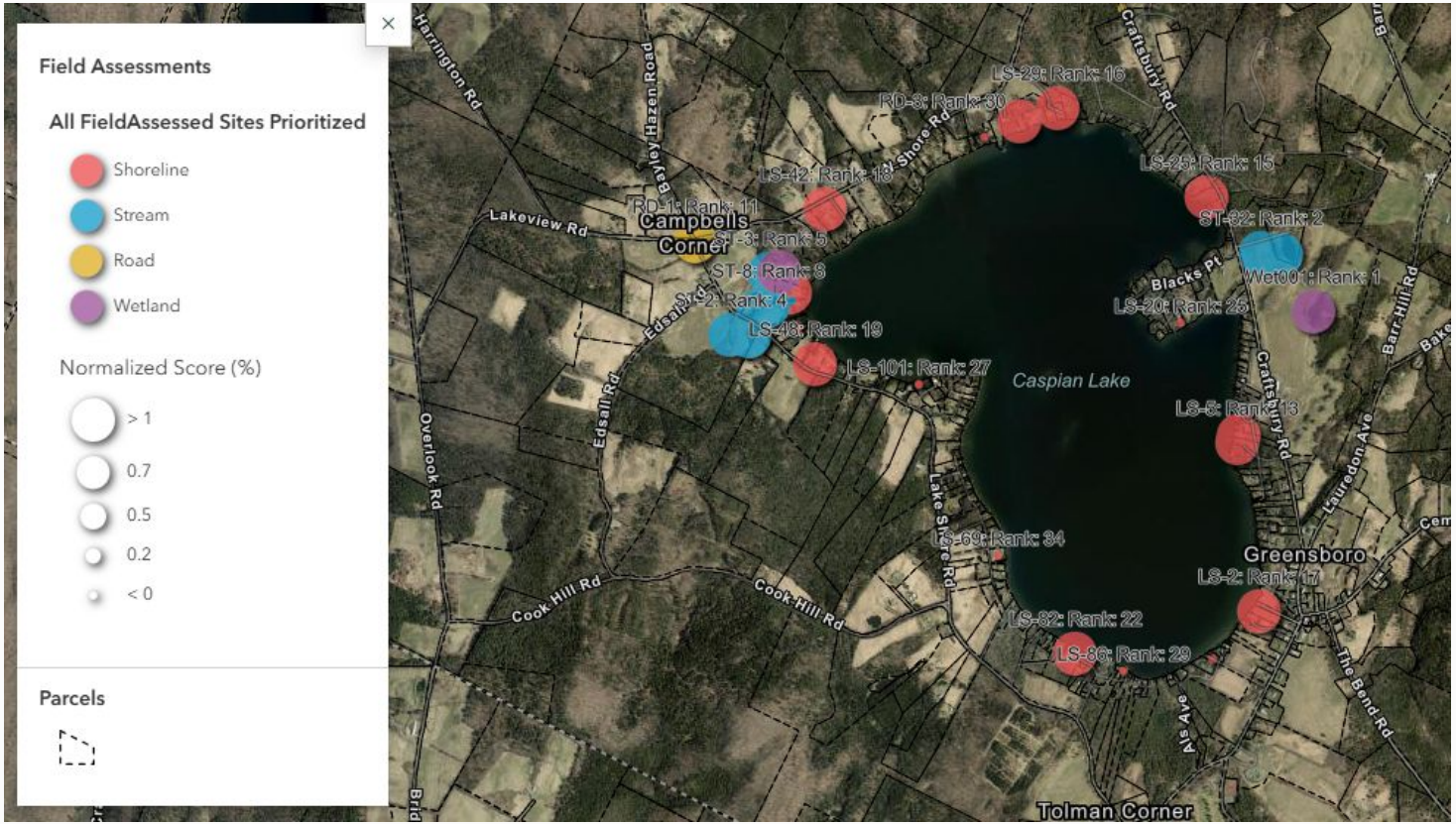


Why increased phosphorus poses a threat to Caspian Lake.

(find the above scorecard here)

Phosphorus is a nutrient critical to the development of algae and aquatic plant life. Increased phosphorus in Caspian also increases the risk of toxic algae blooms that would prevent community members and lakeshore landowners from recreating safely. Phosphorus reduces the water's clarity as well as its quality. These environmental changes would also negatively impact lakeshore property values, and therefore harm Greensboro's tax base.

Lake Watershed Action Plan (LWAP)



Sites Field Assessed:

143

Sites Prioritized:

34

Potential Phosphorus Reduction:

148 lbs/year

Community Engagement (so far)

9/25	Online Survey	Collect baseline data on community use, desired improvements, and perceived shortfalls.
9/25	Community Forum	Introduce the community to the project, receive early feedback, and answer questions.
10/25	Tabling @ Buffalo Mountain Market	Distribute materials, answer questions, and encourage community members to share their perspective.
11/25	Tabling @ Smith's Store	Distribute materials, answer questions, and encourage community members to share their perspective.

Community Feedback

Survey here!

Survey Respondents' **"Most Important Aspects of Caspian Public Beach"**

- #1 Clean Water
- #2 Swimming
- #3 Sandy Beach

Survey Feedback...

Needs Improvement	Should Stay the Same
• "Gardens would be lovely..." • "Too much lawn..." • "Green lawn areas..." • "More native habitat for pollinators" • "Beach erosion prevention"	• "Sandy beach" • "The lawn is nice, keep that!" • "Sandy beach" • "Parking" • "Sandy beach"

Community Forum Feedback...

Needs Improvement	Should Stay the Same
• Parking management • Boat access is too shallow for getting boats in the water • Trash & Pet Feces (Goose Feces)	• Maintain all access • Granite blocks (seating and demarcation that doesn't rot)

Caspian Beach to the Rescue:

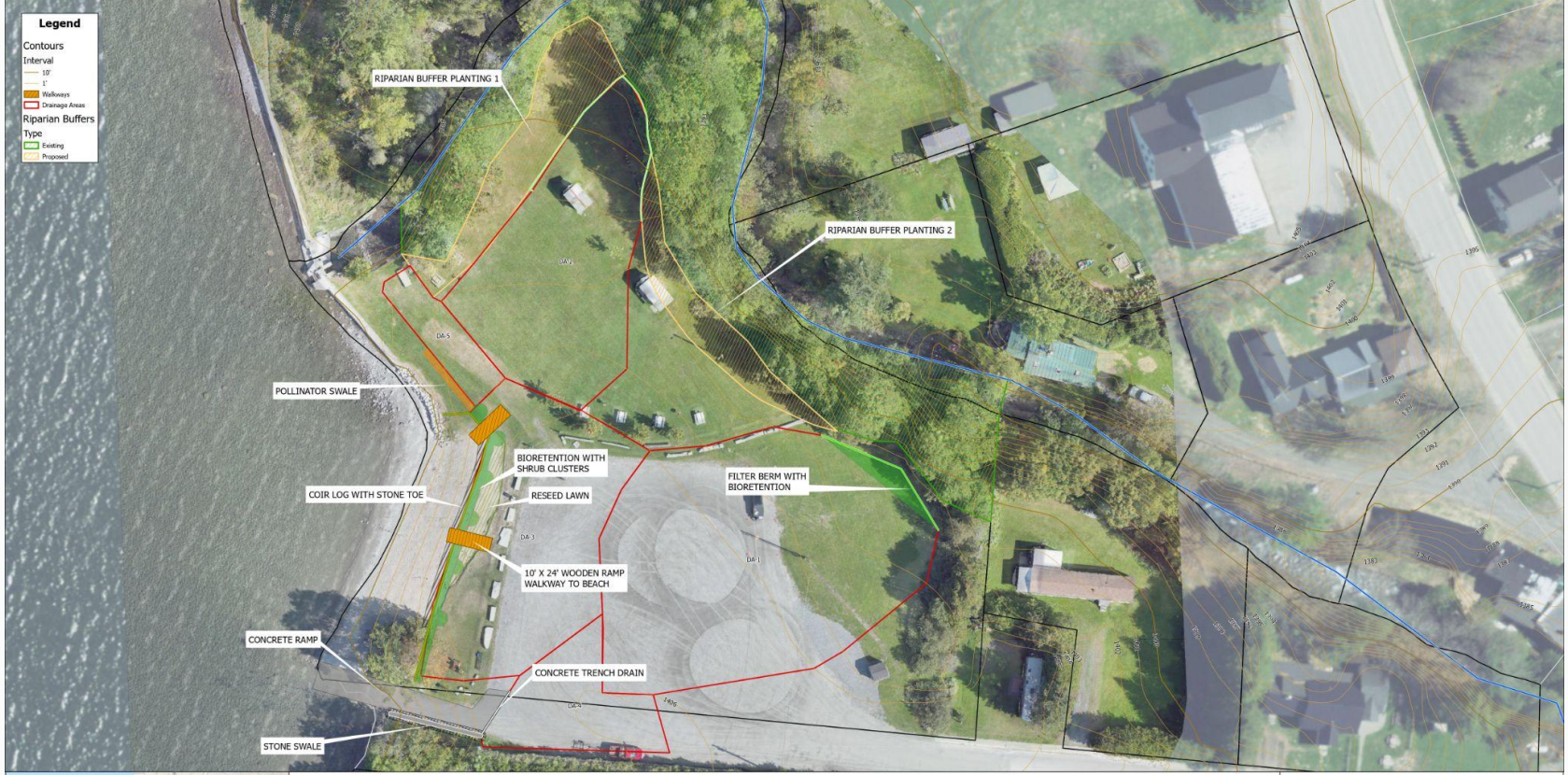
Stormwater & Lakeshore Best Management Practices

Rain Gardens: The large uninterrupted lawn area is currently allowing stormwater to flow directly into the lake. Rain gardens trap runoff and encourage water to infiltrate before reaching the lake. It also adds pollinator habitat and makes a colorful landscaping addition as well.

Walking Paths / Beach Delineation: The areas located directly around the sand beach are eroding due to pedestrian traffic and poor delineation. Defining a clear boundary to the beach and focusing pedestrian traffic with improved walkways will prevent further degradation and allow grass to become better established.

Parking Lot & Boat Launch: Neither of these pieces of vehicle infrastructure properly manage stormwater, which allows it to flow directly into the lake and Greensboro Brook. Waterbars, drains, dry wells, and retention ponds are options that might help address this.

Buffer Plantings: Native species could be considered for addition around the brook and/or the lake to provide better habitat, prevent erosion, and stormwater infiltration.



CASPIAN TOWN BEACH
30% CONCEPT - FINAL

DRAFT CONCEPT NOTES
1. THE PURPOSE OF THE DRAFT CONCEPT PLAN IS TO DENOTE CONCEPT IDEAS AS OF 3/27/2026 3:43 PM.
2. CONCRETE BOAT RAMP TO BE DESIGN AND IMPLEMENTED BY OTHERS. SHOWN ON DESIGN AS SUGGESTED IMPROVEMENT.

UPDATED: 3/27/2026 3:43 PM

N

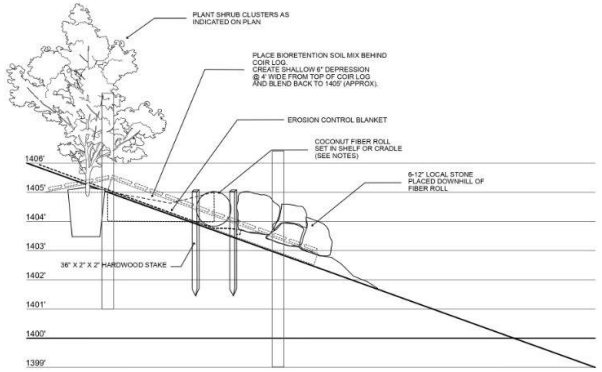
0 50 100 Feet

1 INCH EQUALS 25 FEET
SPATIAL REFERENCE
Name: NAD 1983 2011 StatePlane Vermont FIPS 4400 Ft US

FLUIDSTATE CONSULTING
48 Stowe Street
Waterbury, VT 05676
PH: (802) 999-9762
fluidstateconsulting.com

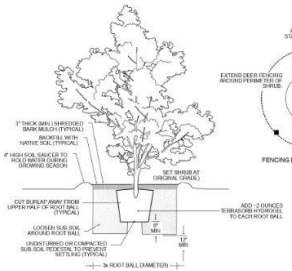
30% CONCEPT

DETAIL - COIR LOG WITH STONE TOE - BIORETENTION WITH SHRUB CLUSTERS

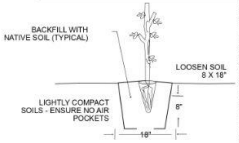


NOTES:
1. GRADE SLOPES AS INDICATED BY PLAN.
2. CREATE 6" DEPRESSION AT TOE OF STABILIZED/REGRADED SLOPE WITH SHOVEL FOR SETTING COIR LOG.
3. PLACE & STAKE EROSION CONTROL BLANKET IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS WITH BOTTOM EDGE BURIED IN SHALLOW TRENCH AND TOP EDGE EXTENDED INTO 5" DEPRESSION.
4. PLACE COIR LOG ON TOP OF TOE EDGE OF EROSION CONTROL BLANKET IN DEPRESSION.
5. DRIVE HARDWOOD STAKES ON FRONT & BACK SIDES OF COIR LOG 12" FROM EACH END, BOTH ENDS, THEN STAGGERED 12" ON-CENTER FRONT TO BACK FULL LENGTH OF LOG TO A DEPTH WHERE TOP OF STAKE IS SLIGHTLY ABOVE TOP EDGE OF COIR LOG.
6. NOTCH STAKES ON OUTSIDE EDGE AND SECURE MANILA OR JUTE ROPE TIGHTLY IN S-PATTERN.
7. SECURE ENDS OF LOGS TO ADJACENT LOG WITH ADDITIONAL MANILA OR JUTE ROPE.
8. DRIVE STAKES ADDITIONALLY TO CINCH DOWN ROPE SECURELY TO LOG. CUT OFF EXCESS STAKE HEIGHT SO TOP OF STAKE IS FLUSH WITH TOP OF COIR LOG.
9. PLACE 6-12" LOCAL ROUNDED STONE ON LAKEWARD EDGE OF COIR LOG IF INDICATED, SLOPED DOWN FROM TOP OF LOG TO EXISTING GRADE.

DETAIL - SHRUB PLANTING



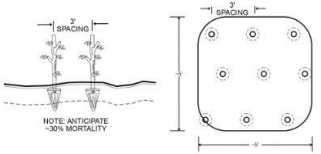
DETAIL - BARE ROOT PLANTING - SECTION



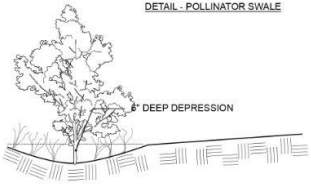
PLANT BARE-ROOT TREES

1. UNPACK AND PREPARE
   - UNPACK YOUR TREES AND REMOVE ALL PACKING MATERIALS.
   - CAREFULLY UNTANGLE THE ROOTS.
   - SOAK THE ROOTS IN WATER FOR 3 TO 6 HOURS.
   - DO NOT ALLOW THE ROOTS TO DRY OUT.
2. DIG THE HOLE
   - DIG A HOLE APPROXIMATELY 8 X 18" FOR EACH BARE-ROOT TREE
   - TO ENCOURAGE ROOT GROWTH, LOOSEN SOIL IN AN AREA UP TO 3 FEET IN DIAMETER.
3. SET THE TREE IN PLACE
   - PLACE THE TREE AT THE SAME DEPTH IT WAS IN THE NURSERY.
   - SPREAD ROOTS NATURALLY INTO THE HOLE.
   - PARTIALLY FILL THE HOLE AND FIRM THE SOIL AROUND THE LOWER ROOTS
   - ADD UP TO 2 OUNCES TERRASORB HYDROGEL PER TREE.
4. BACKFILL AND WATER
   - FILL IN THE REMAINING SOIL, PACKING IT FIRMLY BUT NOT TIGHTLY.
   - CONSTRUCT A WATER-HOLDING BASIN AROUND THE TREE.
   - WATER THE TREE THOROUGHLY.

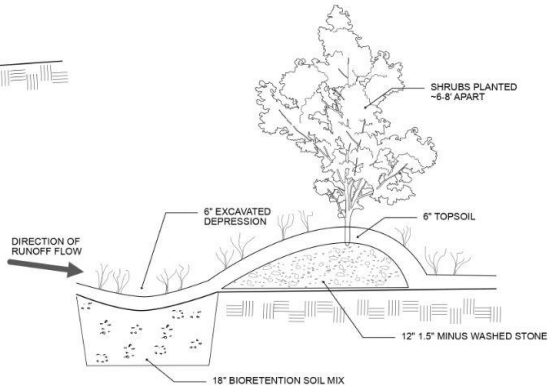
BARE ROOT PLANTING - SPACING



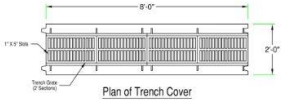
DETAIL - POLLINATOR SWALE



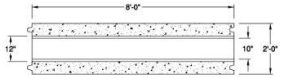
DETAIL - FILTER BERM WITH BIORETENTION



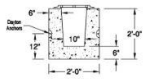
DETAIL - CONCRETE TRENCH DRAIN (PER CAMP PRECAST)



Plan of Trench Cover

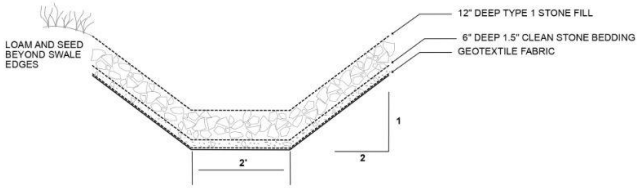


Plan of Trench Box



Section

DETAIL - STONE SWALE



NOTES:
1. LINE DITCHES WITH SLOPES 5-10% WITH STONE
2. SLOPE = 10% - STONE NEEDS TO BE TYPE 1 STONE (AVERAGE DIAMETERS 3 – 12").
3. STONE DEPTH = 12".
4. USE 1.5" WASHED STONE STONE BEDDING UNDER TYPE 1 STONE TO PREVENT EROSIVE UNDERCUTTING.
5. UNDERLAY STONE BEDDING WITH NONWOVEN GEOTEXTILE FABRIC TO PREVENT UNDERCUTTING BENEATH STONE LINING OF SWALE AND NATIVE SOILS.

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Caspian Beach
Stormwater Management - 30% Concept Design - Details

Project Timeline

Step 01: Development

2022 - 2023

This project was first identified by OCNRCD staff in 2022. After State funding was secured, project managers visited the site, met with stakeholders (Greensboro & Hardwick officials), and created a brief report.

Step 02: Preliminary Design

2025 - 2026

OCNRCD applied for design funding after additional discussions with the landowner. These preliminary designs were the result of robust community engagement, technical surveys, and drone imagery. They are intended to be a rough draft, to be polished later in the process.

Step 03: Final Design

2026

Now that preliminary designs are complete, OCNRCD will apply for additional funding. A similar engagement process will unfold, and final designs will be developed with stakeholder input. Any and all permitting concerns will be addressed, and the implementation budget will be improved.

Step 04: Implementation

2027

Once designs are completed and approved contractors will be solicited, materials will be sourced, and implementation will be completed according to the designs. Afterwards, the project will be verified and maintained to State & landowner satisfaction.

Landowner Support Letter

Orleans County Natural Resources Conservation District

—

Landowner Letter of Support for Clean Water Project

Final Design & Implementation

—

Date: 03/27/2026

To whom it may concern,

The **Town of Hardwick** (landowner) fully supports the Orleans County Natural Resources Conservation District (OCNRCD) in applying for and administering grant funding to complete the proposed **final design & implementation** of a Clean Water Project on the property located at **125 Beach Road, Greensboro, VT 05841** and affirms that the **Town of Hardwick** is the legal owner of said property.

This support is given at will, and may be revoked in writing at any time. OCNRCD will make every reasonable effort to keep the **Town of Hardwick** informed of developments in the proposed project as it moves forward.

- ☐ **Photo & Communications Release**: By checking the corresponding box, the landowner grants OCNRCD a non-exclusive, royalty-free license to capture and use photographic and video documentation of the property at all stages of project development and implementation. The landowner also authorizes OCNRCD to publicly share non-sensitive project information, including such documentation, for educational, promotional, and reporting purposes.

Signed,

_____

Mount Ascutney Regional Commission

Water Quality Enhancement Development, Design, and Implementation Block Grant

REQUEST FOR APPLICATIONS NOW OPEN

Date of Issuance: March 30, 2026

Application Deadline: May 15, 2026

Notification of Award: June 1, 2026

~$80k proposed budget

Requested Actions

- Sign landowner support letter
- Identify a project liaison for time sensitive and iterative feedback
- Determine willingness and extent of financial support (permitting, materials cost-sharing, etc.)
- Assist in identifying O&M responsible party

Any questions? Ask away!

Let's discuss any doubts or concerns.
If something comes up later, contact will.marlier@orleanscountynrcd.org