South Kingstown

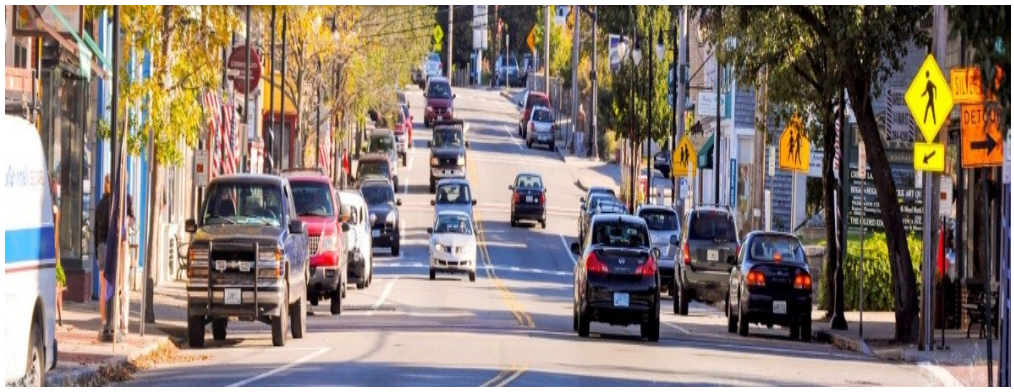

Photo Credits: rihousehunt, SouthKingstownri.com, southcountyri.com, mottandchance

Municipal Resilience Program

Community Resilience Building Workshop

Summary of Findings

August 2019

Town of South Kingstown
Community Resilience Building Workshop
Summary of Findings

Overview

The need for municipalities, academic institutions, regional planning organizations, states and federal agencies to increase resilience and adapt to extreme weather events and a changing climate is strikingly evident amongst the communities of the state of Rhode Island. Recent events such as Tropical Storm Irene and Sandy have reinforced this urgency and compelled leading communities like the Town of South Kingstown to proactively collaborate on planning and mitigating risks. Ultimately, this type of leadership is to be commended because it will reduce the vulnerability and reinforce the strengths of people, infrastructure, and ecosystems and serve as a model for other communities across Rhode Island, New England, and the Nation.

In the spring of 2019, the Town of South Kingstown embarked on certification within the newly established state of Rhode Island's Municipal Resilience Program. As an important step towards certification, Rhode Island Infrastructure Bank (RIIB) and the Nature Conservancy (TNC) provided the Town with a voluntary process to assess current hazard and climate change impacts and to surface projects, plans, and policies for improved resilience. In June 2019, a South Kingstown core team organized a Community Resilience Building Workshop lead by TNC in partnership with RIIB. The core directive of this effort was the engagement with and between community stakeholders, to facilitate the assessment of climate vulnerabilities, and the education, planning and ultimately implementation of priority resilience actions for South Kingstown.

The Community Resilience Building Workshop's central objectives were to:

- Define top local natural and climate-related hazards of concern;
- Identify existing and future vulnerabilities and strengths;
- Develop prioritized actions for the Town of South Kingstown;
- Identify opportunities to collaboratively advance actions to increase resilience.

The Town of South Kingstown employed a unique "anywhere at any scale", community-driven workshop process known as Community Resilience Building (CRB) (www.CommunityResilienceBuilding.org). The CRB's Risk Matrix and various reports, data, and maps were integrated into the workshop process to provide both decision-support and visualization around shared values and priorities across South Kingstown. The draft South Kingstown Hazard Mitigation Plan (January 2019) and Chapter 1 of Resilient Rhody where particularly instructive. Using the CRB process, rich with information, experience and dialogue, the participants produced the findings presented in this summary report including an overview of the top hazards, current concerns and challenges, existing strengths, and proposed actions to improve South Kingstown's resilience to hazards and climate change today, and in the future.

The summary of findings transcribed in this report, like any that concern the evolving nature of risk assessment and associated action, are proffered for comments, corrections and updates from workshop attendees and other stakeholders alike. The leadership displayed by the Town of South Kingstown on community resilience building will benefit from the continuous and expanding participation of all those concerned.

Summary of Findings

Top Hazards and Vulnerable Areas for the Community

During the CRB Workshop, participants identified the top hazards for the Town of South Kingstown. The hazard of greatest concern to the participants was intense wind associated with winter storms and Nor'easters. The other hazards discussed included precipitation-driven flooding from waterways, coastal flooding and sea level rise causing erosion, and extreme temperatures or heatwaves. These hazards have direct and increasing impacts on South Kingstown's residents and resources such as its neighborhoods, natural areas (rivers, wetlands, watersheds, parks), farms, roads, bridges, places of employment, tourism, drinking and wastewater systems, health care facilitates, social support service for disproportionately disadvantaged populations, and other critical infrastructure and community assets.

Top Hazards and Areas of Concern for the Community

Top Hazards

- High Winds (associated with Nor'easters and winter storms)
- Nor'easters and winter snow storms

Additional Hazards discussed:

- Flooding (precipitation-driven inland and riverine)
- Coastal Flooding and Sea Level Rise (causing erosion)
- Extreme and Extended Temperatures (heatwaves)

Areas of Concern in South Kingstown* - Several categories and locations were identified as being particularly vulnerable by workshop participants including:

Natural Resources/Infrastructure: Town Beach (erosion), Open Space, Coastal Ponds, Salt Marshes, Street Trees (along right-of-ways), Community Forests, Groundwater (salt water intrusion into private wells), Aquifers, Streams (unshaded), Beaches and Dunes, Public Parks, Saugatucket River, Farm Land.

Transportation: Matunuck Beach Road, Charlestown Beach Road, Route 138, Route 110, Old Town Road, Route 1/Salt Pond Road, Winchester Drive, Upper Point Judith Pond Road, Middlebridge Road, Peace Dale Road, Green Hill Roads, Card's Pond Road, Kingstown Road, Ministerial Road (3 segments), Moorsefield Road, Worden's Pond Road, Bridges (Middlebridge Road, Bridgetown Road, Succotash Road).

Infrastructure/Facilities: Various Electrical Distribution Lines, On-site Wastewater Treatment System and Pump Stations (Middlebridge, Silver Lake), Saugatucket Pond Dam, Glen Rock Dam, Low-lying Residential Homes, Nursing Homes, Assisted Living Facilities, Public/Affordable Housing, Storm Debris Facilities, Drinking Water Supply System, Matunuck Fire Station, Marina at South Pond, Snug Harbor Aquaculture, Peace Dale Office Building, Transfer Station, Repetitive Loss Properties (25), Isolated Neighborhoods (Green Hill Pond, Prospect Road, Succotash Road, Winchester Drive, Narrow River), Group Homes, Campgrounds, Businesses, Historical Resources and Buildings.

Vulnerable Populations: Off-campus and On-campus URI Students, Special Needs Population, Youth, Elderly and Aging Populations, Low Income/Working Poor, Pets, Visitors and Tourists, Homeless Population, Farmers, 2nd Home Owners.

*Information from workshop participants augmented with the draft South Kingstown NHMP (January 2019).

Current Concerns and Challenges Presented by Hazards

The Town of South Kingstown has several concerns and faces multiple challenges related to the impacts of natural hazards and climate change. In recent years, South Kingstown has experienced a series of highly disruptive and damaging weather events including Tropical Storm Irene (August 2011), Tropical Storm Sandy, (October 2012), winter Nor'easter Nemo (February 2013), and other less impactful but more frequent events. Impacts from Irene included heavy, rain-induced, inland flooding and wind damage. Sandy caused extended coastal erosion and power outages across portions of South Kingstown. The winter storm Nemo dropped 19-20" of snow on the Town knocking out power and isolating residents and neighborhoods due to extended road closures. The magnitude and intensity of these events and others across Rhode Island has increased awareness of natural hazards and climatic change, while motivating communities like South Kingstown to proactively and comprehensively improve resilience.

This series of extreme weather events highlights that for South Kingstown the impacts from hazards are diverse; ranging from coastal flooding of roads and low-lying areas near rivers during intense storms and heavy precipitation events to property damage from trees, wind, snow, and ice. Longer periods of elevated heat, particularly in July and August, have raised concerns about vulnerable segments of the population including the elderly and disabled. The combination of these issues presents a challenge to preparedness, response and mitigation priorities and requires comprehensive yet tailored actions for particular locations and/or areas across South Kingstown.

The workshop participants were generally in agreement that South Kingstown is experiencing more intense and frequent storms events and heat waves. The impacts have affected the daily activities of most residents. Additionally, there was a general concern about the challenges of being prepared with contingency plans for worst case scenarios during different times of the year (i.e. major disasters, storms, major hurricanes (Cat-3 or above)) particularly in the fall/winter months due to more intense storms.

(Credit: southkingstownri.com)

(Credit: southkingstownri.com)

(Credit: trailsandwalksri.org)

Specific Categories of Concerns and Challenges

As in any community, South Kingstown is not uniformly vulnerable to hazards and climate change, and certain locations, resources, and populations have and will be affected to a greater degree than others. Workshop participants identified the following items as their community's key areas of concerns and challenges across three categories - Infrastructure, Societal, and Environmental.

Infrastructure Concerns and Challenges

Roads and Road Networks:

- Low-lying coastal roads and roads in close proximity to riverine systems subjected to erosion and routine flooding from storm surge and stormwater runoff.
- Long-term prognosis of Matunuck Beach Road and associated roads in area.

Septic Systems:

- Privately owned and maintained on-site wastewater treatment systems subject to flooding in high flood and high groundwater areas.

Dams:

- Recognition of number of large and small dams (privately or publicly owned) and potential for catastrophic failure under current and future precipitation projections.

Emergency Management and Preparedness:

- Major hurricane creating and creating and bringing unmanageable volume of storm and ocean debris.

Housing:

- Direct impacts to structures from storms.
- Isolation of homes when road network is compromised.
- Education about potential for current and future impacts to structures.
- Concerns about household contaminants and storm debris post-storm.
- Cost of insurance longer term for coastal properties with high exposure.
- Repetitive Loss Properties.

Specific Categories of Concerns and Challenges (cont'd)

Societal Concerns and Challenges

Vulnerable Populations:

- Implications to local residents, visitors, and tourists in neighborhoods susceptible to flooding and isolation due to limited access and egress (i.e. Matunuck Beach area).
- Implications on disproportionately disadvantaged populations (i.e. homeless, elderly, working poor, etc.) due to flooding, winter storms, and heat waves.
- Emergency communications with elderly and non-English speaking populations.

Power:

- Power outages to residential homes and business particularly during the winter months.
- Low income households vulnerability due to power outages.

Environmental Concerns and Challenges

Groundwater:

- Salt water intrusion into groundwater and coastal private wells and continued need for protection of drinking water resources.

Beaches and Dunes:

- Ongoing routine and episodic (Storm Sandy) erosion and loss of beaches and dunes (i.e. Town Beach) and potential impacts on attraction for visitors and tourists.

Trees and Forests:

- Increasing impacts to tree health from pests and pathogens resulting dead and standing trees which pose risk to power lines.
- Lack of municipal-wide comprehensive tree and forest management plan.

Current Strengths and Assets

Just as certain locations, resources, and populations in South Kingstown stand out as particularly vulnerable to the effects of hazards and climate change, other features are notable as assets to South Kingstown's resilience efforts. Workshop participants identified the following items as their community's key strengths, and expressed interest in using them as the core of future resilience building interventions.

- Clearly, the responsive and committed leadership exhibited by officials and staff is a very appreciated strength within South Kingstown. Ongoing collaboration between the Town, business community, faith-based organization, NGOs, adjoining municipalities, County and State-level organizations among others on priorities identified will help advance comprehensive, cost-effective, community resilience building actions.
- The Town has highly experienced staff with access to adequate resources for most emergency situations. The coordination amongst various departments including leadership, Police, Fire, and EMS was cited as an ongoing, and highly valued community strength despite the ongoing need to maintain volunteers over time (i.e. Community Emergency Response Team).
- Emergency Operations Center is fully functional with onsite, back-up power.
- The Town has developed a high quality sheltering system as various schools as well as with University of Rhode Island including back-up shelters with generators.
- Engagement with University of Rhode Island as a collaborative emergency management preparedness and response partner is highly valued.
- Intact forested watershed surrounding ponds and wetlands across South Kingstown coupled with riparian corridors and coastal marsh and wetlands which provide flood storage, freshwater resource, enhance public amenities for recreation and gathering, and increase ecological function and biodiversity.
- Strong social support network and civic groups via active engagement and participation in municipal by faith-based organizations, community-action NGOs (Johnnycake Center, Welcome House, etc.), land trusts, and neighborhood groups, among others.
- Presence of the South County Hospital to rprovide health care needs before, during, and after major events and additional healthcare support (i.e. Thundermist).
- Several farms and supportive residents that help to increase availability of locally produced food.

Top Recommendations to Improve Resilience

A common thread throughout the workshop discussions was the recognition that South Kingstown needs to be better prepared through longer term, community-based, contingency planning across all areas of concern. This need and additional highlights surfaced and prioritized by the workshop participants are provided below by several subcategories including capacity building, projects, plans/preparedness/studies/outreach, and policy.

Higher Priority

Capacity Building:

- Development of a "Resiliency Corps Program" that engages volunteers through education and training on resiliency, preparedness, emergency response (adults and K-12 education), and communication with other citizens.
- Revisit status of CERT and look to expand role as well as ensure good geographic representation of volunteers across municipality.
- As part of a volunteer program, evaluate immediate and long-term needs for capacity and expertise of volunteers across municipality.
- Continue to work to increase retention and recruitment of volunteers for Fire Department.
- Need to boost EMS funding and service to ensure needs are meet at 55+ communities and nursing facilities.

Projects:

- Elevate and/or protect the concrete sewer pump station at Middlebridge Road from current and future storm surge and/or sea level rise projections.
- Installation of green stormwater infrastructure with robust maintenance plan in identified location across municipality.
- Install generator at Recreation Center to increase strength of sheltering capacity.
- Look to increase energy supply and redundancy via microgrid(s), battery backup, and major solar installations.

Community Resilience Building Workshop Recommendations

Higher Priority (cont'd)

- Increase water conveyance capacity of Saugatuck Road culvert via initial assessment, design, construction with consideration of green stormwater infrastructure installations.
- Identify salt marsh restoration priorities and conduct projects that enhance ecological function and/or protect people and property.

(Credit: Adam Whelchel/TNC)

Plans/Preparedness/Studies/Outreach:

- Assess level and location of affordable housing options across municipality with a focus on safety, access and improving housing opportunities and choices for current and future residents.
- Ensure route to Hospital is secure and passable during storm water and flooding events by clearing road, street sweeping, and routine drain clearing.
- Secure funding and extend sea wall to the west on Matunuck Beach Road to further protect the road and associated infrastructure.
- Develop a comprehensive Forest Management Plan for municipality that integrates or synchronizes with Tree Management Plan that focuses on roadways, grid lines, and residential safety. Identify and implement priority reforestation projects per the suggested Forest Management Plan.
- Establish a Tree Management Plan with a focus on removal of diseased trees in proximity to existing power lines.
- Continue to improve availability and redundancy in the drinking water supply by developing a study to expand water supply, increase land acquisition and advantageous land use, and institute water usage regulations as needed.
- Improve disaster communication to and engagement with vulnerable population that require additional assistance via health database.

Community Resilience Building Workshop Recommendations

Higher Priority (cont'd)

- Create Housing Improvement Program that utilizes volunteers, brings existing housing stock up to code via CDBG funding, improves affordable housing opportunities, and institutes requirements for compliance that involves landlord registration process.
- University of Rhode Island collaboration to proactively study and design resilient solutions and to provide technical assistance for community identified needs.
- Acquisition, conservation easements, and/or state open space funding to protect current undeveloped coastal parcels to prevent additional structures being placed in vulnerable locations.
- Update Open Space priority list to include lands that could increase resilience for municipality.
- Assess the feasibility and cost of extending sewer lines to priority flood areas in community.
- Look to develop a coordinated communication plan for emergency management activities and procedures via regular meetings across the NGO community (i.e. churches, Elks, Johnnycakes, Welcome Committee, Boy Scouts, SRI volunteers, etc.).
- Identify and increase educational outreach to home owners in low lying areas prone to flooding regarding potential hazards of basement flooding and movement of oil tanks resulting in ruptured pipes and release of heating oil.
- Proactively conduct outreach to local businesses to explore potential options to reduce vulnerabilities depending on need including improvement to structures such as floodproofing and elevation as well as more significant considerations such as relocation.
- Continue to coordinate communications and planning between URI and municipal staff around sheltering options (i.e. Ryan Center).
- Continue to update communications infrastructure at municipal emergency operations center.
- Coordinate with health department on drinking water supplies and procedures during emergencies.

Community Resilience Building Workshop Recommendations

Higher Priority (cont'd)

- Explore options for burying most essential segments of electric distribution lines.
- Complete emergency action plan for Glen Rock Dam.
- Work with non-profit community to increase the removal of dams where situations allow.
- Continue to educate citizens and organizations on benefits of riparian and coastal buffer zones for risk reduction.
- Identify temporary debris storage sites including location for contaminated debris and large marine debris (i.e. boats) and review regulations every 5 years.
- Ensure special needs, homeless, and other vulnerable populations have resources and funding available to support requirements as well as maintain records of willing individuals to assist with response before and after disasters.
- Explore developing an overall road network resilience improvement plan (elevation, relocation, culvert redesign, etc.) that includes determining private property owner's willingness to accommodate road relocation options beyond current public right-of-ways.
- Review and strengthen as needed household debri and chemical cleanup and recovery procedures and protocols to ensure expose to residents and the environment is minimized.
- Need to enhance communications and outreach in cooperation with state about evacuation routes via municipal and/or state roads in advance of events.
- Assess the immediate and long-term implications of downed trees and limbs on overall road network across entire municipalities and into adjoining municipalities.
- Assess the exposure of inland location of low-income housing and disproportionate susceptibility to power loss.
- Catalogue and prioritize potential for voluntary acquisition of exposed residential units and work to secure funding.

(Credit: Adam Whelchel/TNC)

Community Resilience Building Workshop Recommendations

Higher Priority (cont'd)

- Coordinate emergency management action plans between municipality and URI that fully defines available resources, expertise, and capacity.
- Initiate sharing of research information with municipality by URI to increase overall resilience of community.
- Need to increase the communications between nursing facilities and emergency management professionals in municipality.
- Explore potential use of social media and networks for emergency communications.

Policy:

- Increase regional coordination and efficiencies regarding wastewater treatment system that build on existing MOAs.
- Improve oversight by Housing Authority to increase accountability and responsibility concerning conditions of existing housing.
- Explore opportunities for streamlining the current beach replenishment procurement and contracting process.
- Upzone and re-evaluate coastal zoning including a review of transfer of development rights options to help reduce risk.
- Reevaluation current zoning to ensure and/or incentive development away from areas prone to flooding currently and with future flooding and sea level rise projections.

Community Resilience Building Workshop Recommendations

Moderate Priority

Capacity Building:

- Continue and strengthen funding and personnel for maintenance and new plantings of trees across municipality.
- Address capacity issues for evacuation and create thorough and transferable procedures to manage evacuation of residents, renters, and tourists (depending on season).

Projects:

- Need to prioritize and install AC and heating for aging housing stock.
- Continue to improve drinking water distribution system by upgrading existing supply lines and removing interconnectedness of various private and public water systems.
- Conduct general repair of exposed rebar hazard at Marina at South Pond and Public Boat Ramp.
- Public/Private partnership to engage citizens and establish an adopt-a-spot program for coastal locations.
- Address flooding at Chipuxet and Route 138 via land acquisition and road improvements that include green stormwater infrastructure.

Plans/Preparedness/Studies/Outreach:

- In partnership with URI, advance existing and conduct additional studies as needed focused on the functionality of onsite wastewater treatment systems associated with residential dwellings in low lying areas susceptible to flooding from storm surge and/or sea level rise and decreasing depth to groundwater (i.e. separation).

(Credit: Adam Whelchel/TNC)

Community Resilience Building Workshop Recommendations

Moderate Priority (cont'd)

- Initiate watershed management plan, water storage options, and stormwater management efforts for the Saugatucket River.
- Conduct full inventory and assessment of wastewater infrastructure facility and pump stations to identify and prioritize resilience measures needed including elevation and/or water proofing and power continuity.
- Assess the options to use agricultural lands as water sink and pumping diversion locations during large events.
- Clarify the capacity of Transfer Station to receive storm debris and ensure capacity limits are common knowledge during emergency response and recovery activities.
- Ensure a focused assessment of Route 138 and associated infrastructure (culverts, bridges, intersections, adjoining Amtrak line, etc.) to ensure continuity of service before, during, and after major events including flooding and impacts from downed trees and limbs.
- Conduct specific hydrology assessment of Saugatuck River Watershed proximate to Route 138 and 110.
- Examine the implications of contamination of drinking water supply due to salt water intrusion across municipality.
- Begin the process of initial exploration regarding longer-term options to relocate and retreat from the Matunuck Beach area to help minimize public safety issues and costs associated with maintaining infrastructure over time. Include assessment of implications to Succotash Road in Matunuck Beach area.
- Study alternative erosion control techniques for Town Beach.
- At the South County Hospital, ensure planning for various emergency scenarios continues that assess overflow, increased ambulance services, and patients triaged elsewhere.
- Assess the vulnerability of Matunuck Fire Station under various flooding scenarios.
- Continue to ensure existing shelters remain up to date and ready to activate with prioritization on Matunuck School.

Community Resilience Building Workshop Recommendations

Moderate Priority (cont'd)

- Continue to ensure existing shelters remain up to date and ready to activate with prioritization on Matunuck School.
- Need to enhance evacuation plan that includes URI, dependent, and tourist population and improves access and capacity of RIPTA.
- Evaluate via feasibility assessment potential for microgrid(s) in municipality.
- Conduct study of small dam condition, generate catastrophic failure map for lower hazard dams, and assess cost/benefit of removal versus immediate and long-term maintenance as needed.
- Encourage purchase and installation of private generators and battery backup for residential units and businesses across municipality.
- Identify mechanism to continually review hazard mitigation plan and implementable actions.
- Conduct community forums and increase education of coastal homeowners regarding risk, responsibilities, and options in the short and long term.
- Messaging campaign during Hurricane Preparedness Week that looks to encourage development of essential food and water needs kit as residential preparedness steps.
- Continue to engage with Chamber in storm preparation for business community to help educate business owners about resources available after storms.
- Conduct scenario analysis of potential impacts to tax base from various hazards and storm scenarios.
- Re-assess availability of boats for water-dependent responses during disasters.
- Ensure that tourists are further educated regarding risk and procedures during disasters by maintaining evacuation signage and instituting an ordinance that requires the provision of evacuation information in rental units across municipality.
- Need surface water management strategy that includes flood storage options, water quality improvements, tree restoration for shade on trout streams and minimization of potential contaminants over time for watersheds across the municipality.

Community Resilience Building Workshop Recommendations

Moderate Priority (cont'd)

- Revisit and reassess routine and pre-storm road maintenance plan and procedures with emphasis on cleaning drains and storm water conveyance systems across municipality. Establish trackable maintenance plan with at least annual cleaning of drainage systems on critical access and egress roads.
- Look for opportunities for beneficial reuse of dredge material on salt marshes via "thin-layer deposition" techniques.
- For the Route 138 bridge (Amtrak line), assess the long-term viability and life cycle of bridge because of the critical function as evacuation route for region and URI as well as review tree management and debris plans is available to help maintain access/egress across bridge.
- Enhance availability of routine sheltering options on a daily basis for vulnerable populations.

Policy:

- Review of groundwater overlay standards needed to ensure long-term viability of aquifer.
- Consider securing or drafting a policy to enable transfer of ownership for vulnerable dams from private to public with cost/benefit assessment of removal versus maintenance over time.
- Seek to ensure new construction integrates generators or back-up batteries in to final build.

Community Resilience Building Workshop Recommendations

Lower Priority

Projects:

- Relocate Charlestown Beach Road inland.

Plans/Preparedness/Studies/Outreach:

- Increase awareness at campgrounds about emergency evacuation routes and procedures to ensure safety of campers.
- Assess the flood gates and needs for other infrastructure at Peace Dale Office Building.
- Conduct additional outreach and communications regarding preparedness to boat owners at Marina at South Pond in advance of major events.
- Assess the impacts of various storm events on aquaculture in Snug Harbor.
- Continue to monitor the long-term viability of the Saugatucket Pond high hazard dam.
- Encourage pet owners to plan for their pet's safety during disasters.
- Need to clarify URI's role and responsibility for student population for on campus versus off campus.

(Credit: pintrest.com)

CRB Workshop Participants: Department/Organization

Town of South Kingstown - Town Council
Town of South Kingstown - Town Manager
Town of South Kingstown - Planning Department
Town fo South Kingstown - Building Inspection and Zoning
Town of South Kingstown - Leisure Services
Town of South Kingstown - Public Works and Utilities
Town of South Kingstown - Fire Department
Town of South Kingstown - Police Department
Town of South Kingstown - Emergency Management Services
Town of South Kingstown - Waterfront Advisory Committee
Town of South Kingstown - Zoning Board of Review
Town of South Kingstown - Planning Board
Town of South Kingstown - Conservation Commission
Town of South Kingstown - Recreation Commission
South Kingstown Land Trust
Narrow River Preservation Association
Southern Rhode Island Chamber
Welcome House
Kingston Improvement Association
South County Tourism
Village Trust
University of Rhode Island
Thundermist Health Center
Rhode Island Department of Environmental Management
Rhode Island Coastal Resource Management Council

South Kingstown Core Project Team

Chelsea Siefert - Planning Department
Kaela Gray - Planning Department
Jay Parker - Planning Department

Workshop Facilitation Team

Rhode Island Infrastructure Bank - Shaun O'Rourke (Lead Coordinator)
The Nature Conservancy – Adam Whelchel (Lead Facilitator)
Coastal Resource Management Council - Caitlin Chaffee (Facilitator)
University of Rhode Island - Pam Rubinoff (Facilitator)
Save the Bay - David Prescott (Facilitator)
Independent - Brian Ambrette (Facilitator)
Scribes - Alec Mehr (RIIB), Brianna McFadden (RIIB), Sophie Xu (RIIB)

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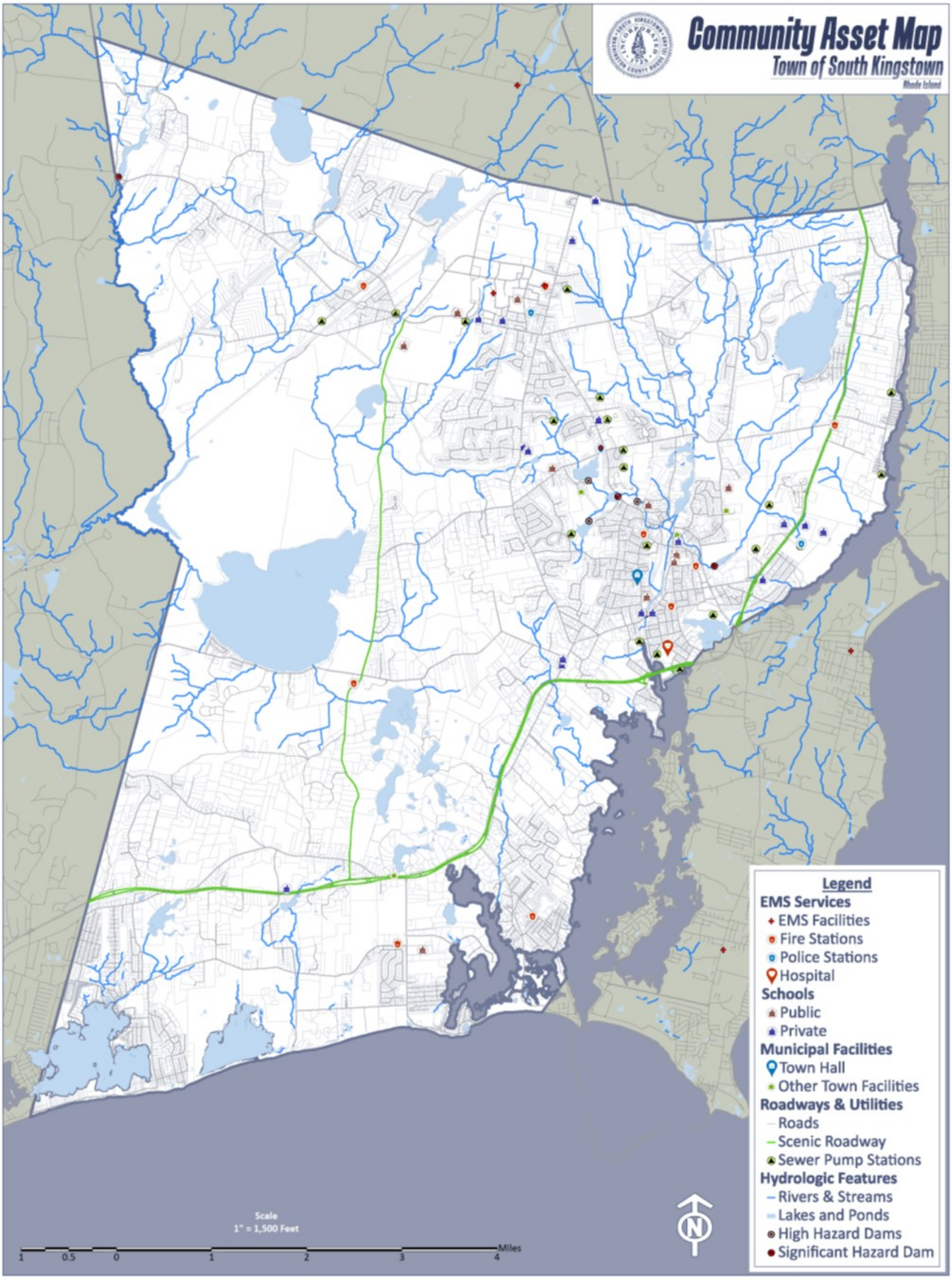
This workshop was made possible in part through the generous contribution of the facilitation team members who skillfully conducted the South Kingstown Community Resilience Building workshop in close partnership with the Town's Core Project Team.

Appendix

Base Map


Community Asset Map
Town of South Kingstown
Rhode Island
Legend
EMS Services
EMS Facilities
Fire Stations
Police Stations
Hospital
Schools
Public
Private
Municipal Facilities
Town Hall
Other Town Facilities
Roadways & Utilities
Roads
Scenic Roadway
Sewer Pump Stations
Hydrologic Features
Rivers & Streams
Lakes and Ponds
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Significant Hazard Dam
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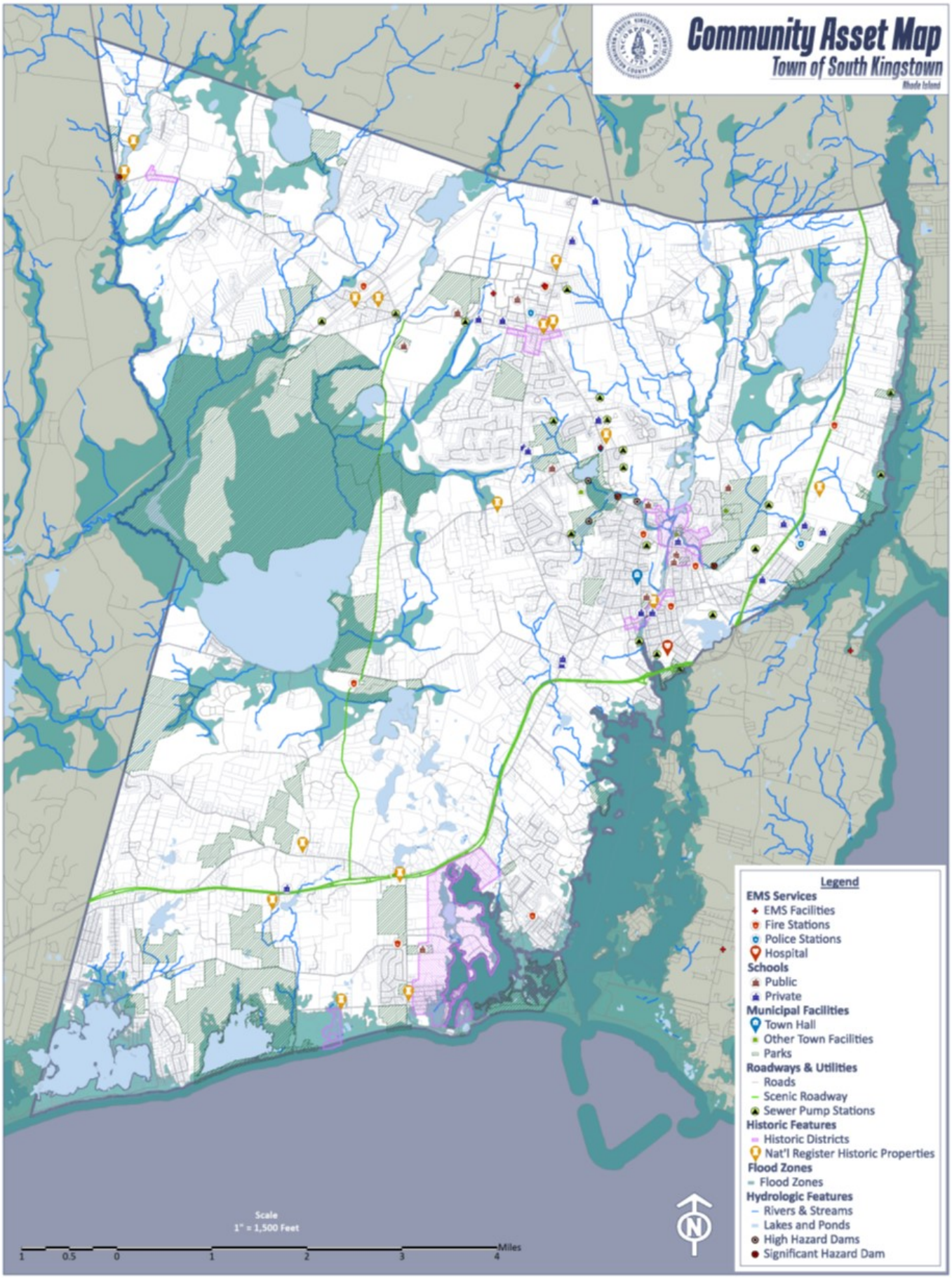
Resources and Maps Used During Workshop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Historic Districts
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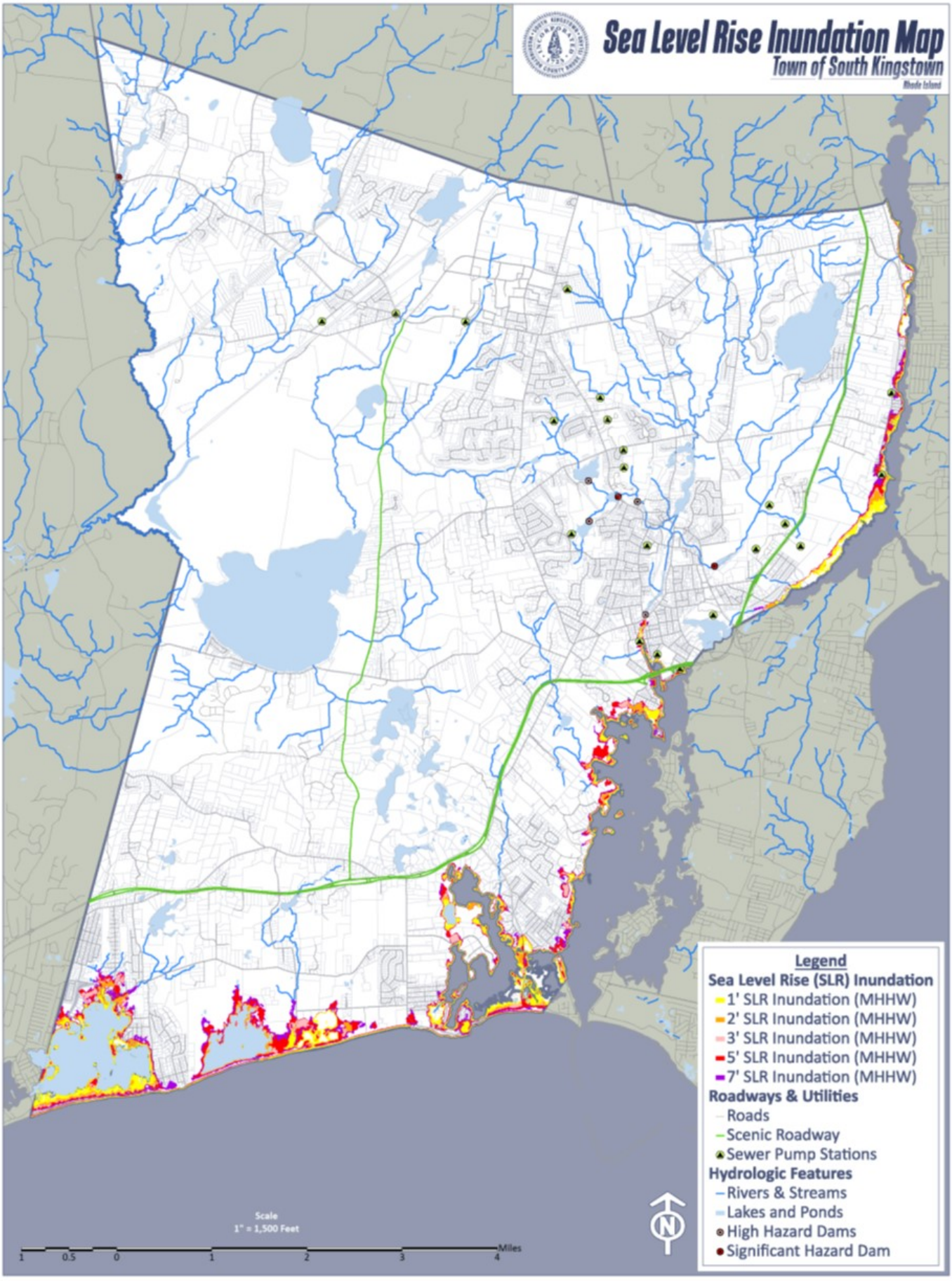
Sea Level Rise Inundation Map
Town of South Kingstown
Rhode Island
Legend
Sea Level Rise (SLR) Inundation
1' SLR Inundation (MHHW)
2' SLR Inundation (MHHW)
3' SLR Inundation (MHHW)
5' SLR Inundation (MHHW)
7' SLR Inundation (MHHW)
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Rivers & Streams
Lakes and Ponds
High Hazard Dams
Significant Hazard Dam
Scale
1" = 1,500 Feet
1 0.5 0 1 2 3 4 Miles
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Figure 2: Population Density (2010 data)

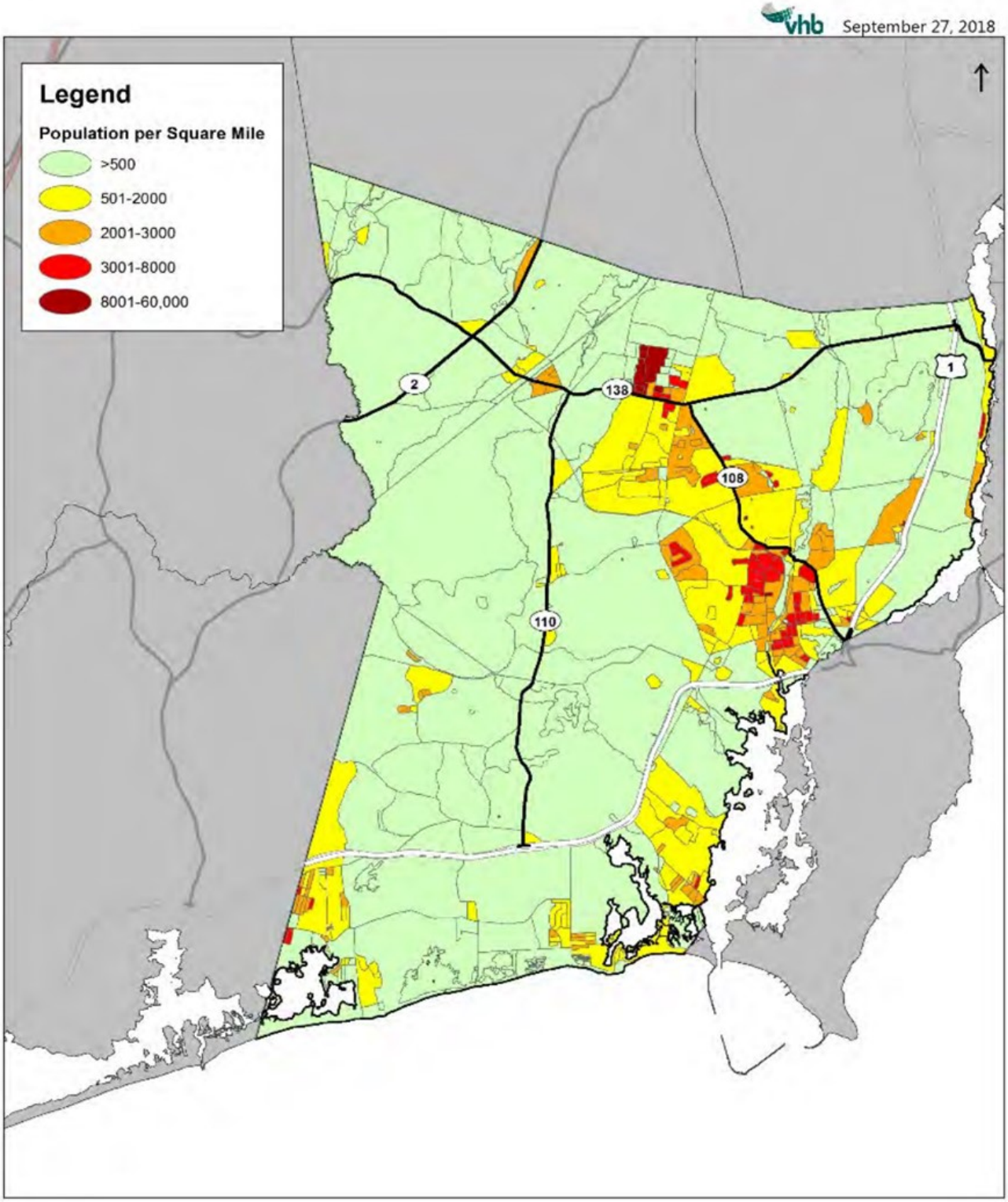

Figure 3: Land Use (2011 data)

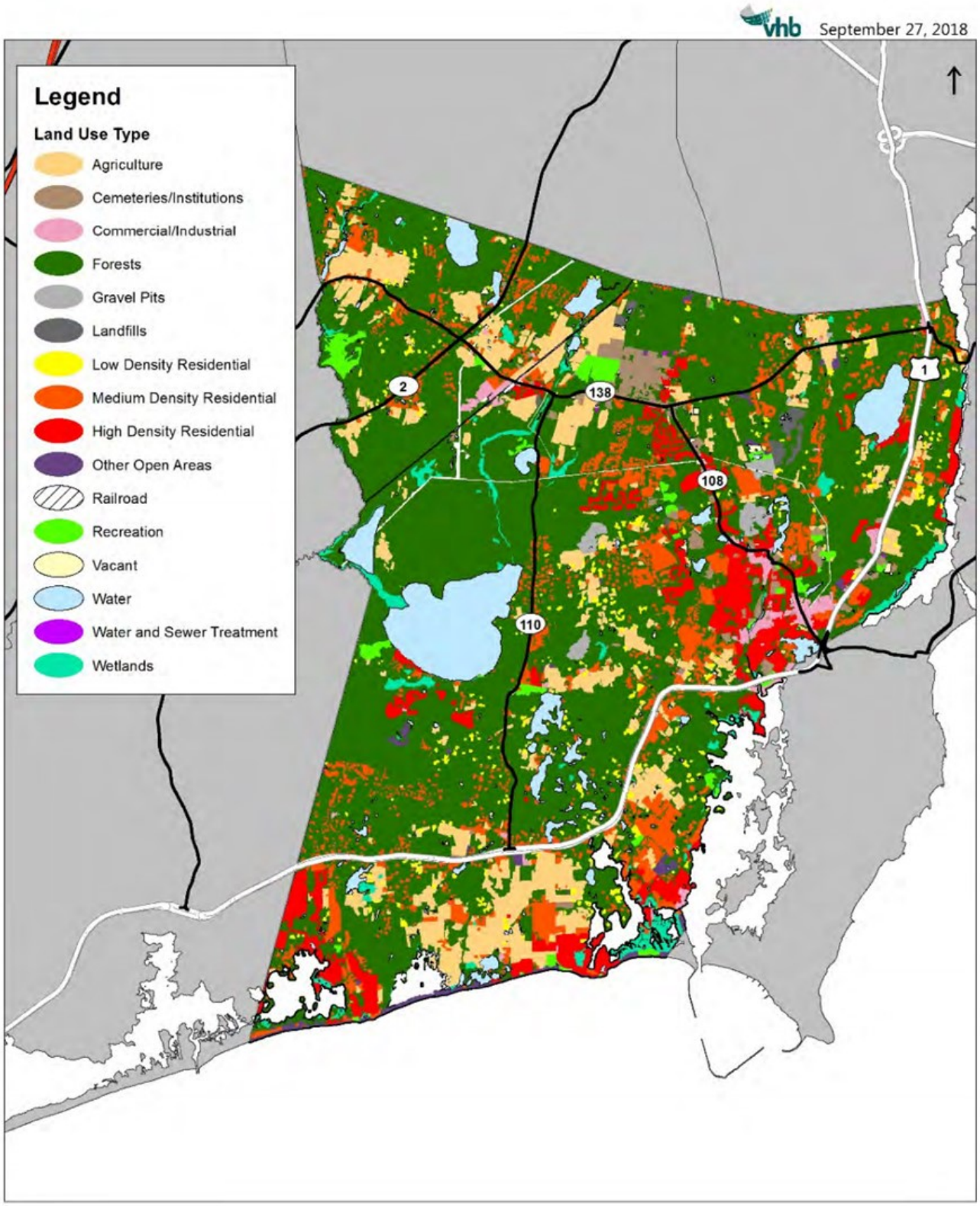

Figure 4 **Water Resources in South Kingstown**

Project: South Kingstown Hazard Mitigaiton Plan Updata
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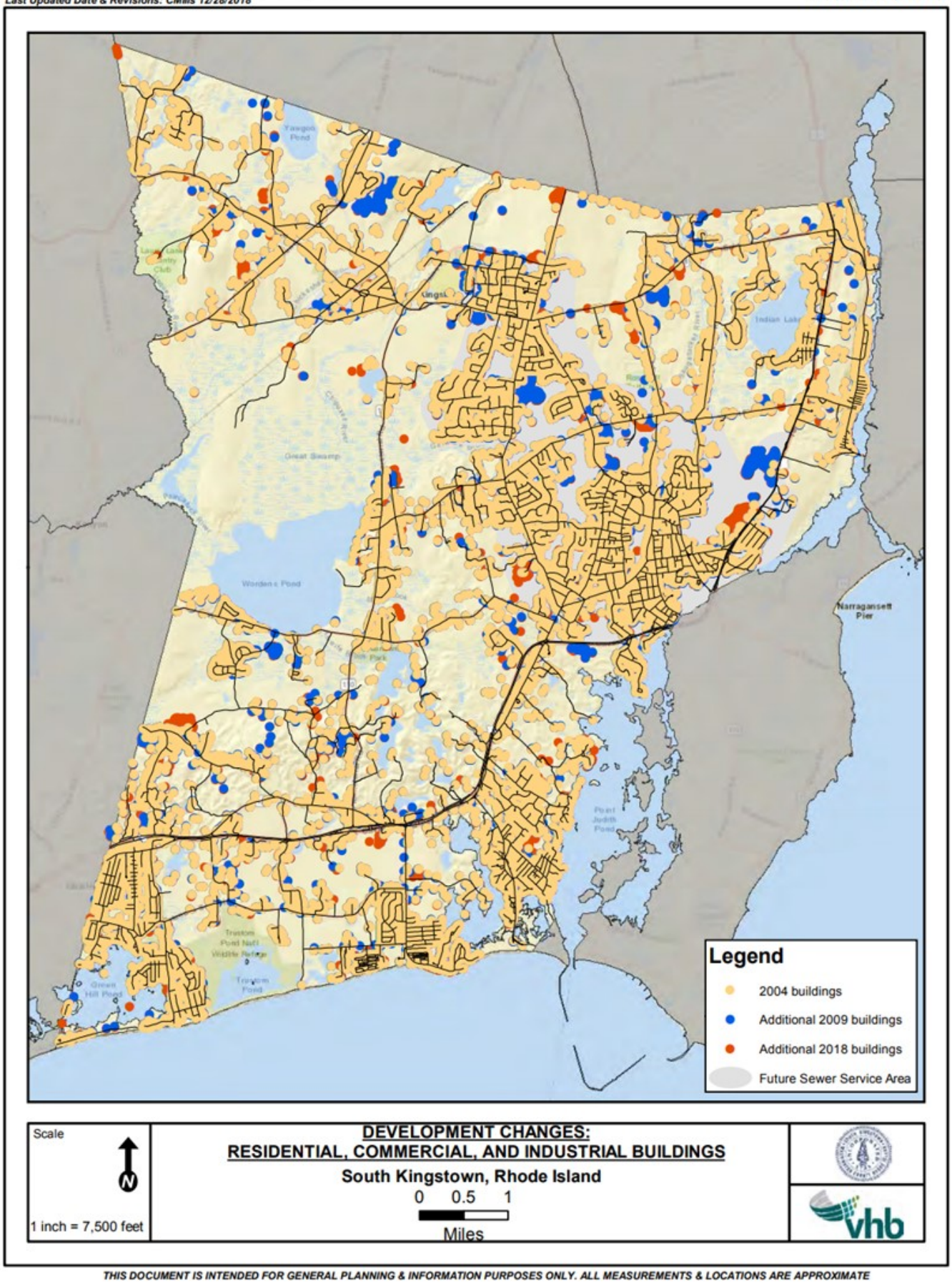
Last Updated Date & Revisions: CMills 12/28/2018

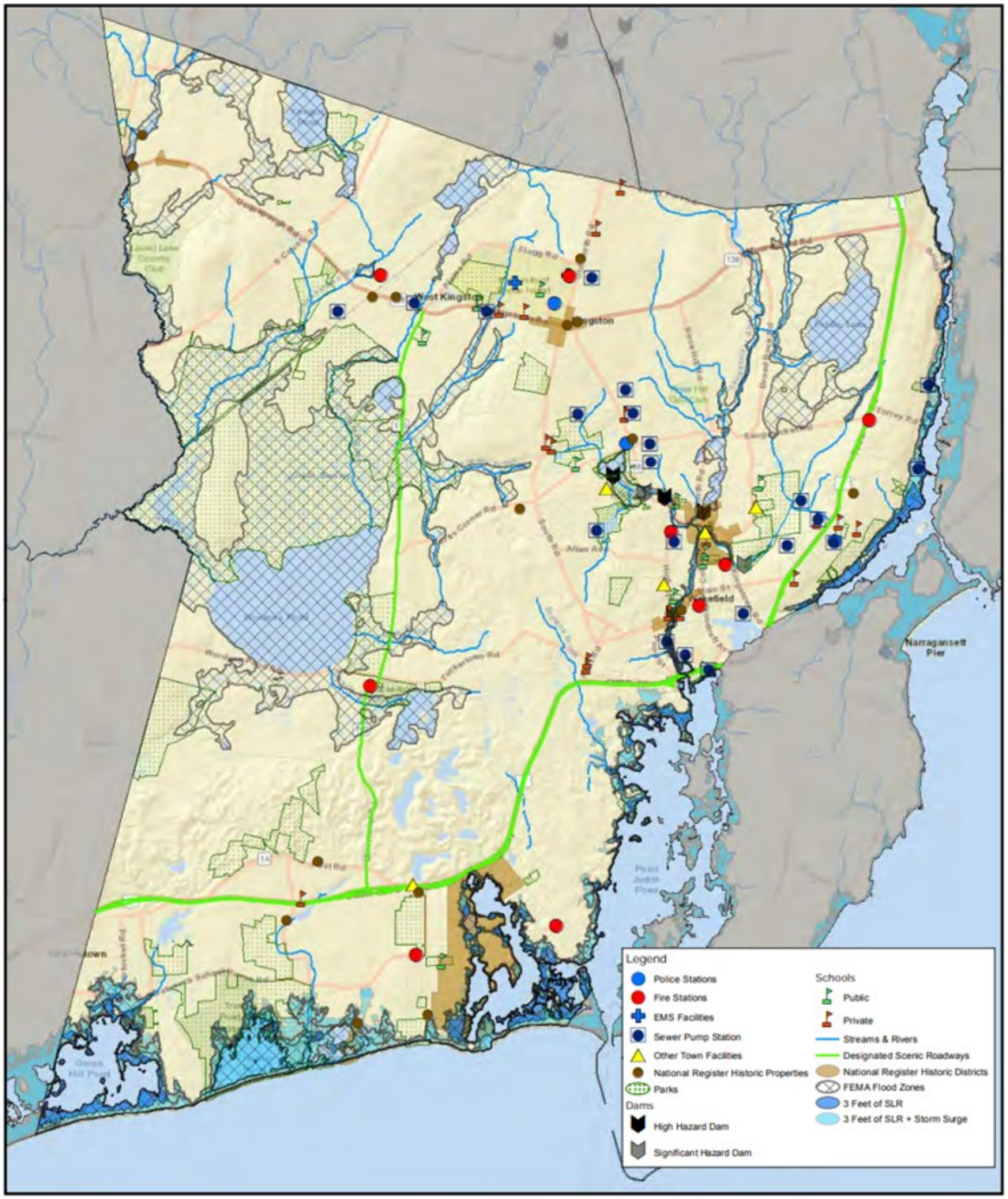
Date: 12/28/2018



THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE

Project: South Kingstown Hazard Mitigation Plan Update
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\SK Resources.mxd
Last Updated Date & Revisions: CMills 12/7/2018

Date: 12/7/2018



Scale
1 inch = 7,500 feet

C1: COMMUNITY ASSETS
South Kingstown, Rhode Island

0 2.5 5
Miles

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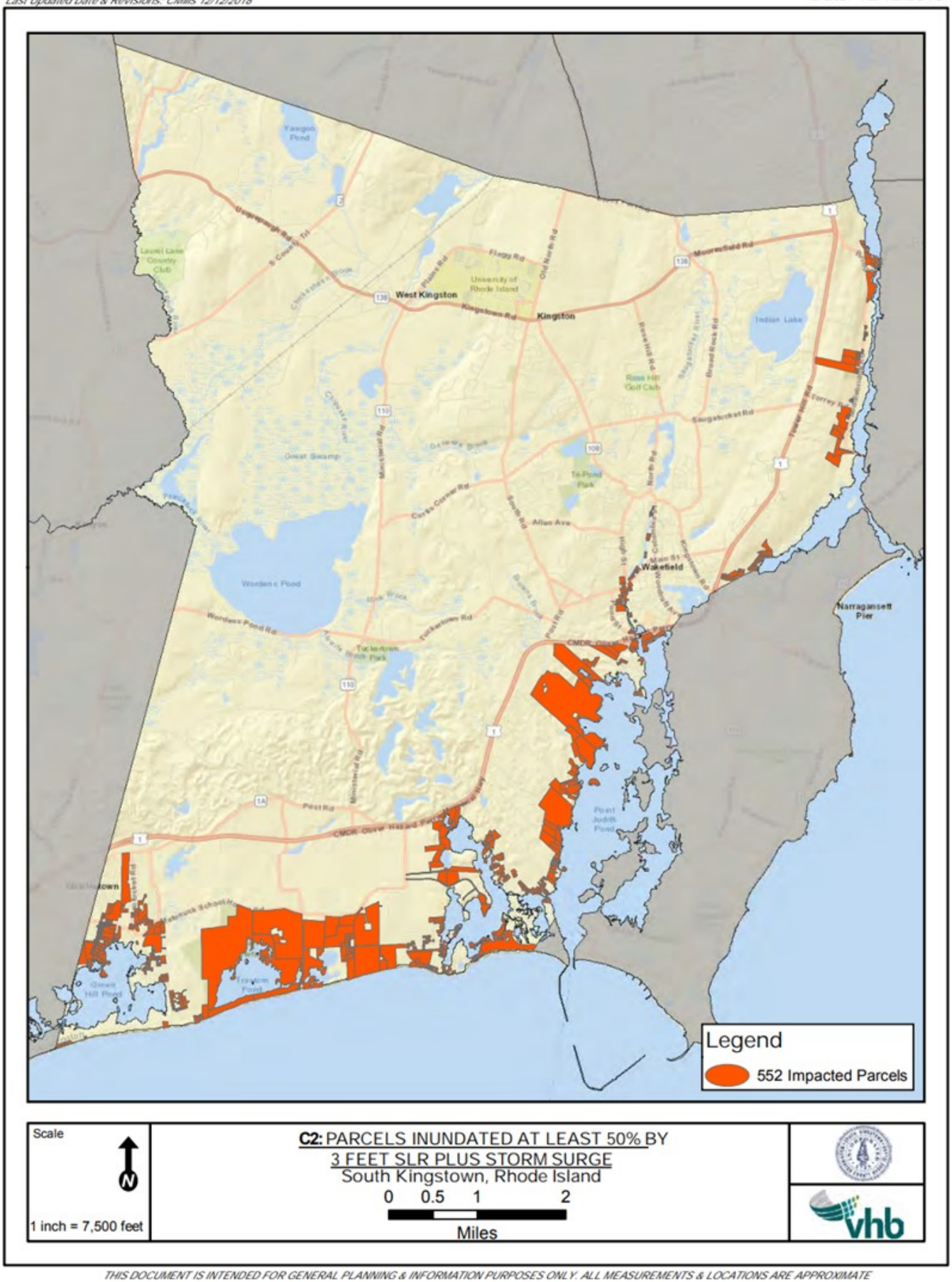
Project: South Kingstown Hazard Mitigaiton Plan Updata
File: I:\vhb\gis\proj\Providence\72925.00\gis\Output\SK 50P Parcels.mxd
Last Updated Date & Revisions: CMills 12/12/2018

Date: 12/12/2018



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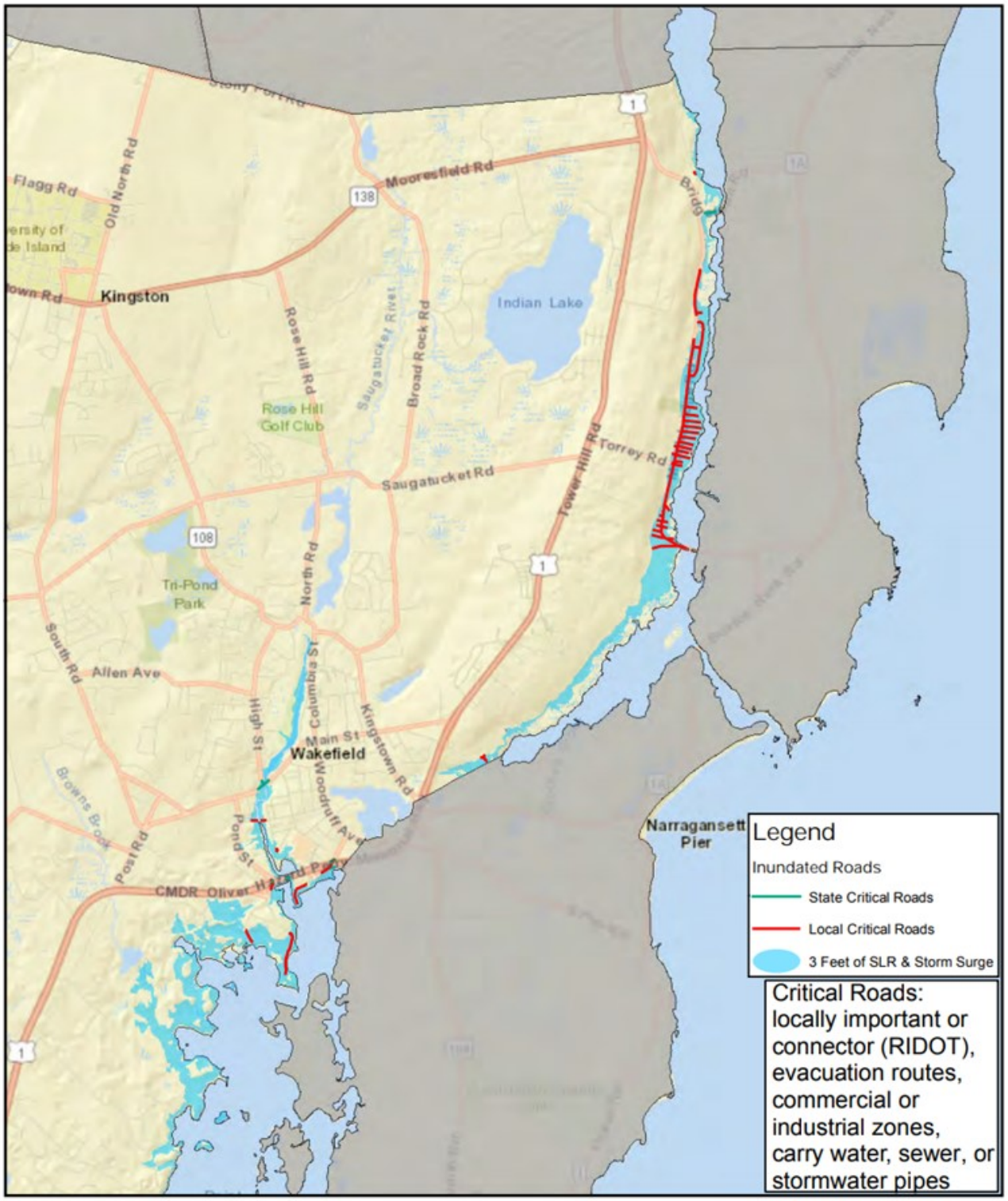
Project: South Kingstown Hazard Mitigation Plan Update
File: I:\vhb\gis\proj\Providence\72925.00\gis\Output\SK Roads.mxd
Last Updated Date & Revisions:: CMills 12/10/2018

Date: 12/10/2018



Scale

1 inch = 4,583 feet

N

C3: ROADS IMPACTED BY 3 FEET OF SLR AND STORM SURGE FROM 1% ANNUAL CHANCE STORM

South Kingstown, Rhode Island

0 0.5 1

Miles

vhb

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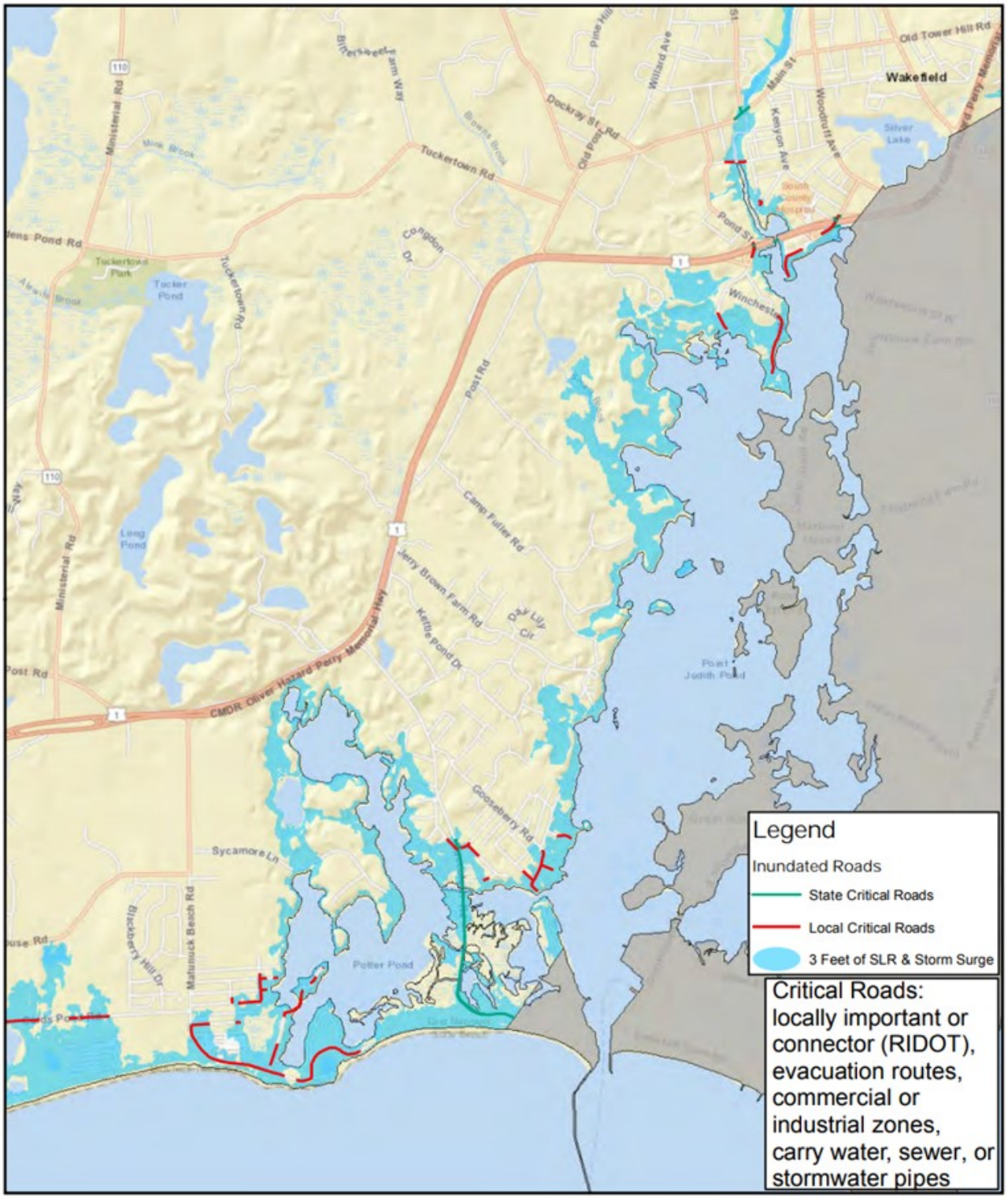
Project: South Kingstown Hazard Mitigation Plan Update
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\SK Roads.mxd
Last Updated Date & Revisions: CMills 12/10/2018

Date: 12/10/2018



Scale
1 inch = 3,333 feet

C3: ROADS IMPACTED BY 3 FEET OF SLR AND STORM SURGE FROM 1% ANNUAL CHANCE STORM

South Kingstown, Rhode Island

0 0.5 1

Miles

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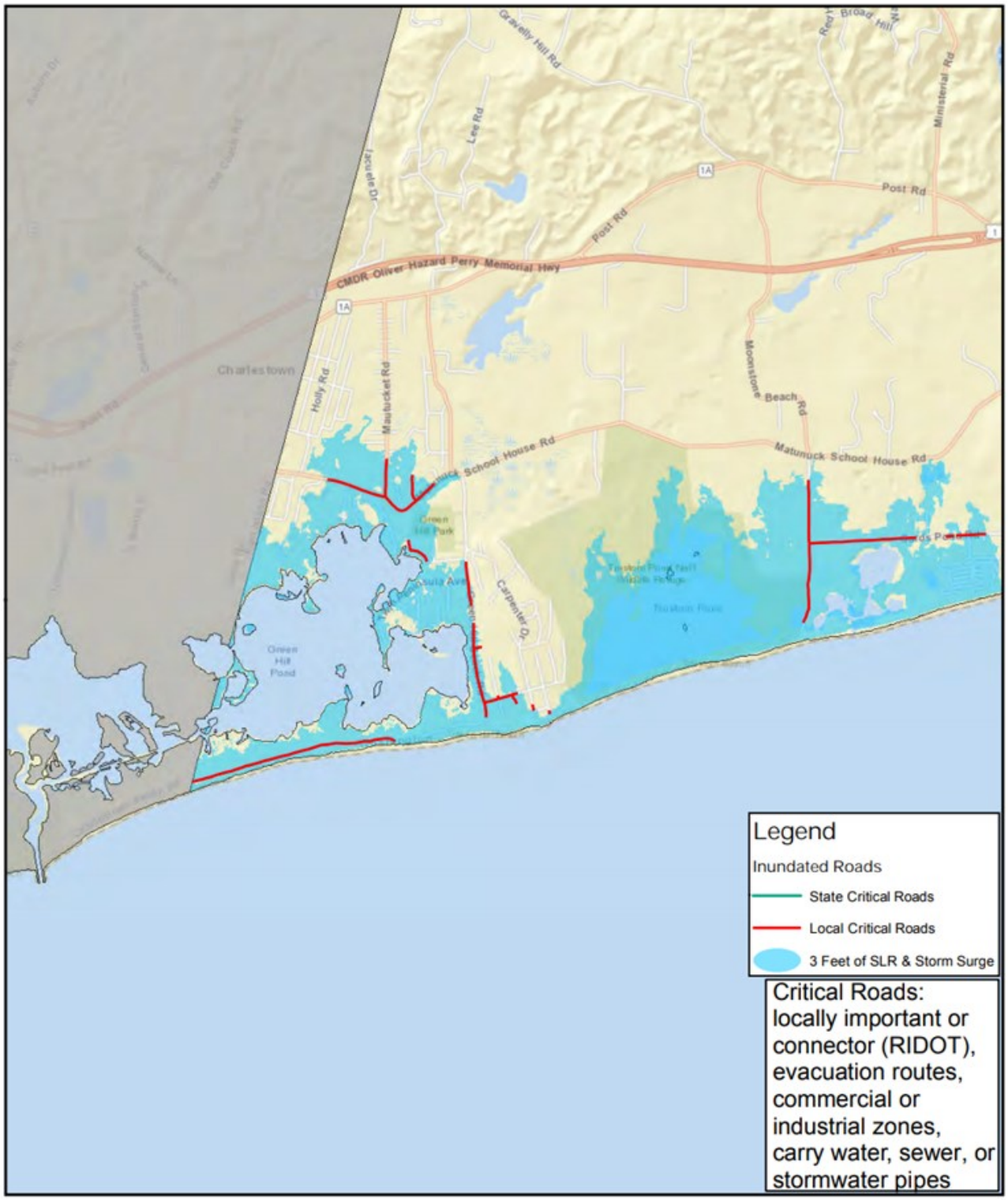
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\SK Roads.mxd
Last Updated Date & Revisions: CMills 12/10/2018

Date: 12/10/2018



Scale
1 inch = 3,333 feet

C3: ROADS IMPACTED BY 3 FEET OF SLR AND STORM SURGE FROM 1% ANNUAL CHANCE STORM

South Kingstown, Rhode Island

0 0.5 1

Miles

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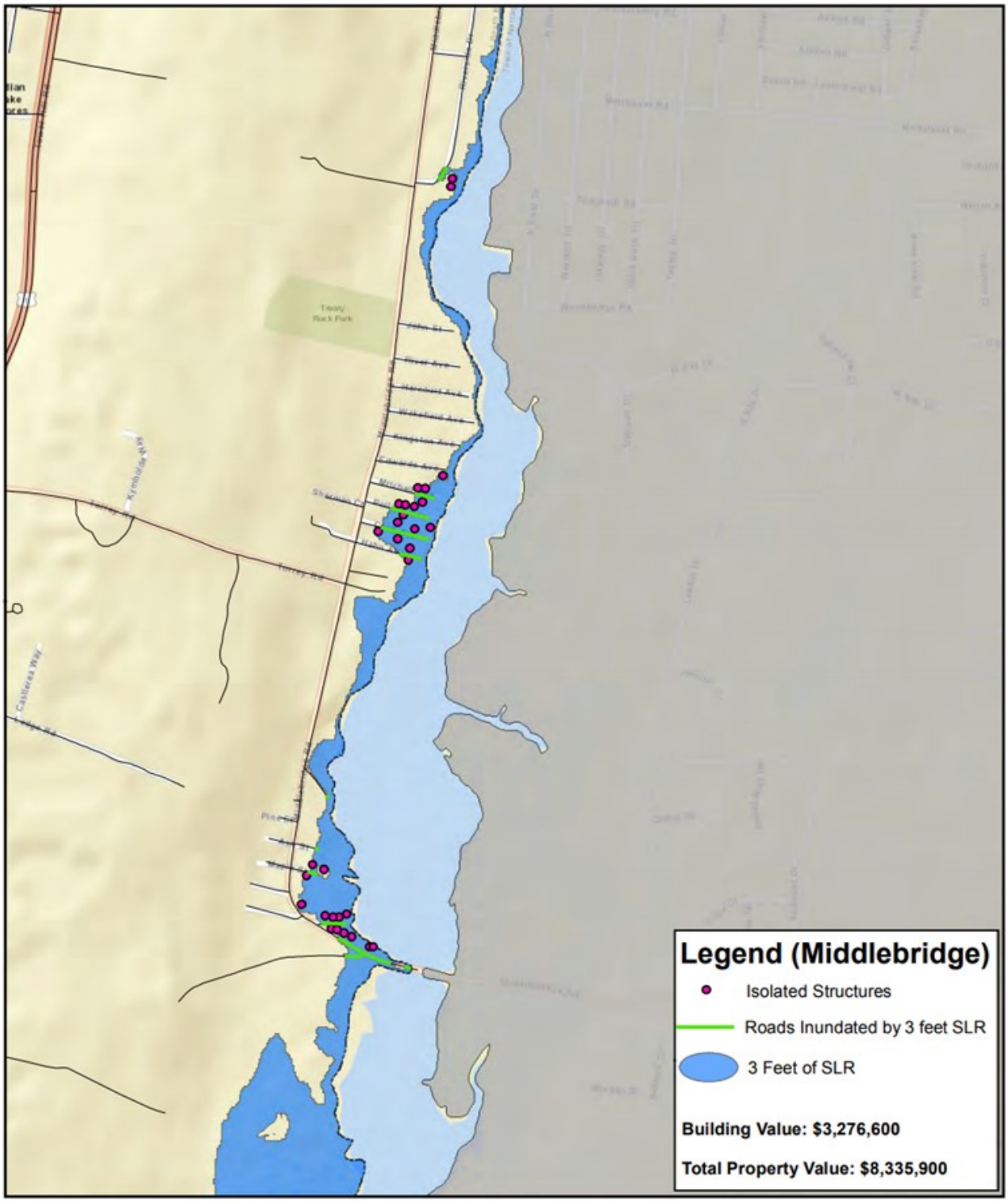
Project: South Kingstown Hazard Mitigaiton Plan Updata
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\SK Isolation.mxd
Last Updated Date & Revisions: CMills 12/5/2018

Date: 12/5/2018



Scale

1 inch = 1,011 feet

C4: PROPERTIES THAT WILL BE ISOLATED BY ROADS INUNDATED BY 3 FEET OF SEA LEVEL RISE

South Kingstown, Rhode Island

0 0.25 0.5

Miles

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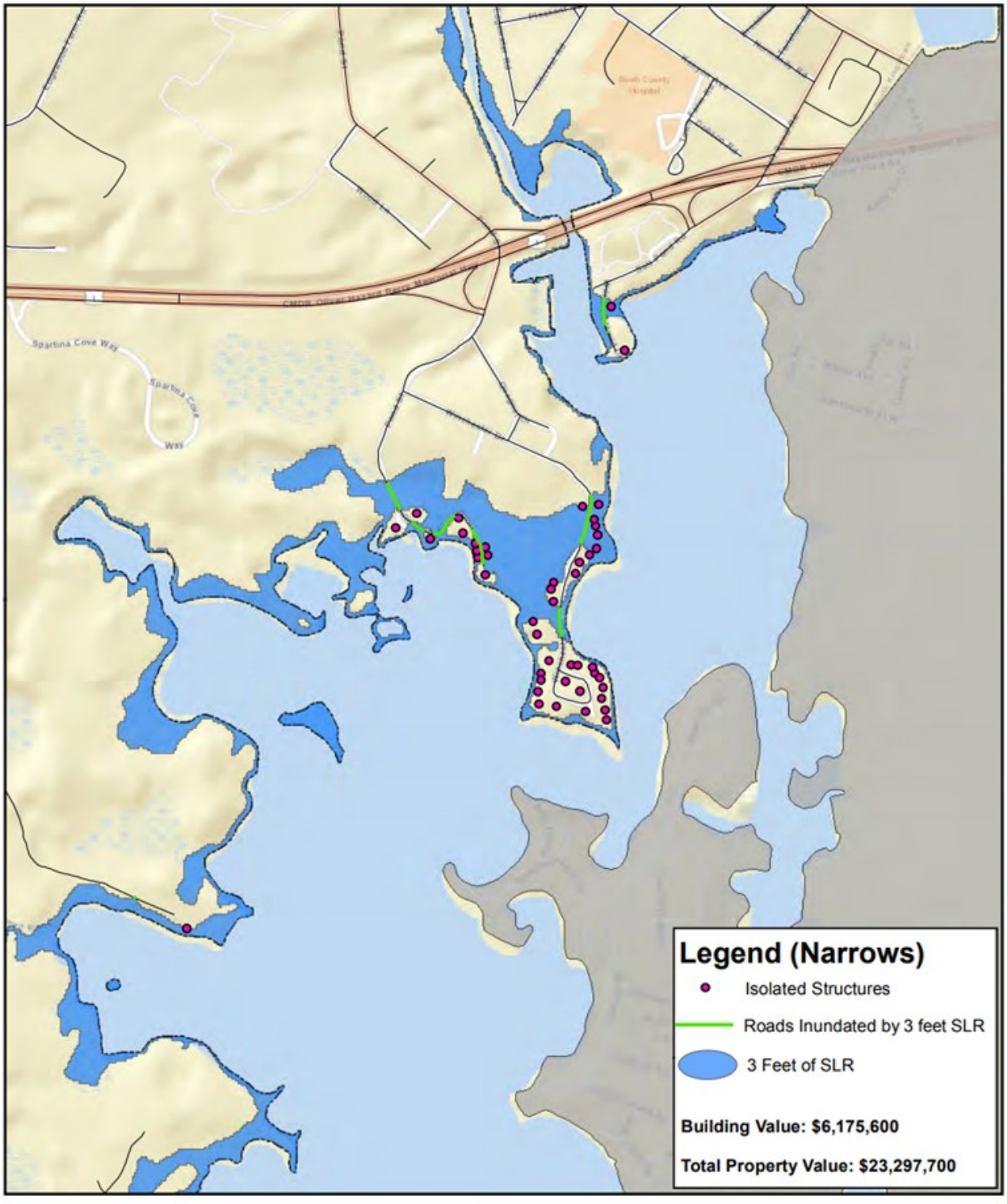
Project: South Kingstown Hazard Mitigaiton Plan Updata
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\SK Isolation.mxd
Last Updated Date & Revisions: CMills 12/5/2018

Date: 12/5/2018



Scale

1 inch = 1,011 feet

C4: PROPERTIES THAT WILL BE ISOLATED BY ROADS INUNDATED BY 3 FEET OF SEA LEVEL RISE

South Kingstown, Rhode Island

0 0.25 0.5

Miles

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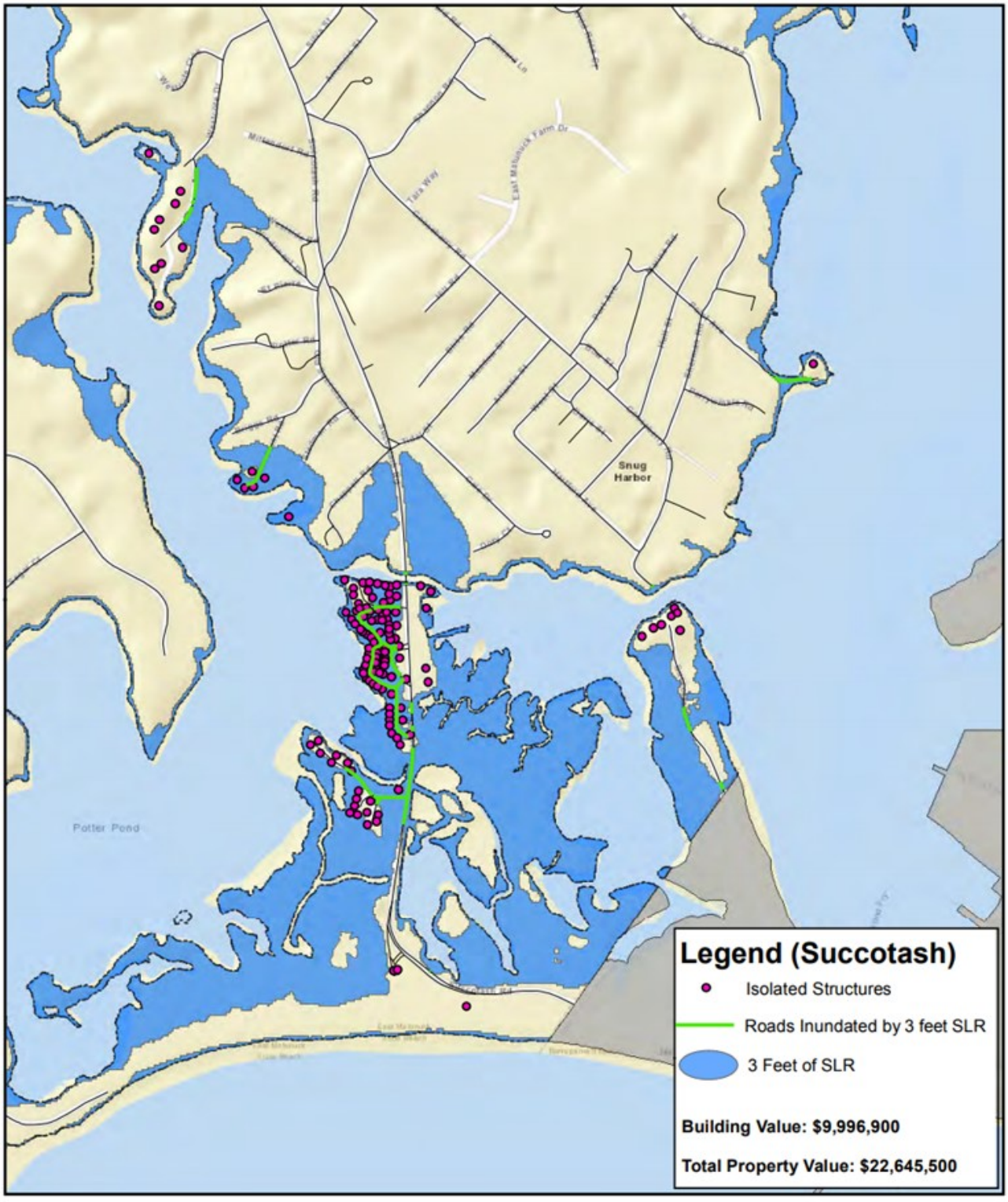
Project: South Kingstown Hazard Mitigaiton Plan Updata
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\SK Isolation.mxd
Last Updated Date & Revisions: CMills 12/5/2018

Date: 12/5/2018



Scale
1 inch = 1,011 feet

C4: PROPERTIES THAT WILL BE ISOLATED BY ROADS INUNDATED BY 3 FEET OF SEA LEVEL RISE
South Kingstown, Rhode Island
0 0.25 0.5
Miles

vhb

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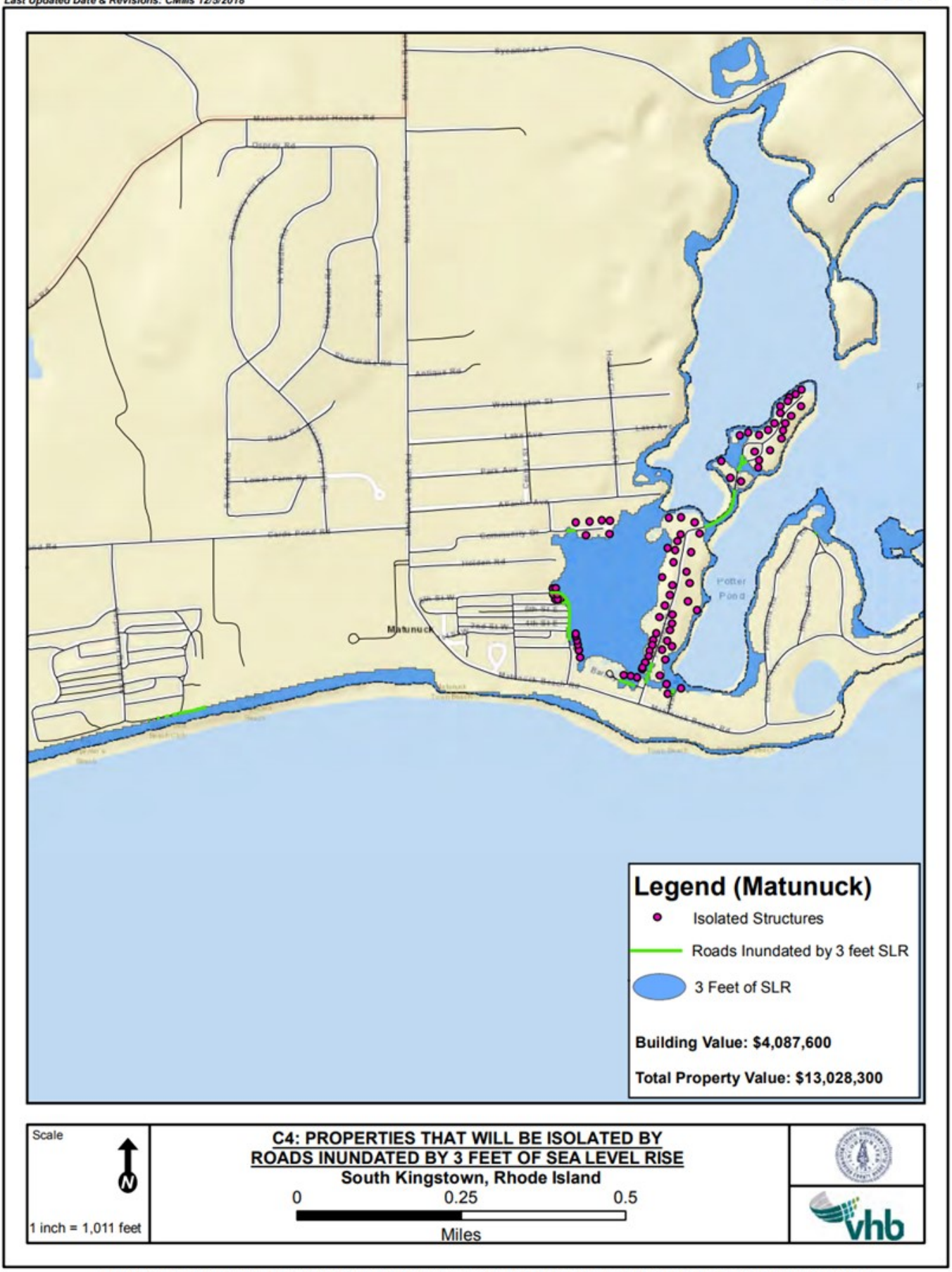
Project: South Kingstown Hazard Mitigaiton Plan Updata
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\SK Isolation.mxd
Last Updated Date & Revisions: CMills 12/5/2018

Date: 12/5/2018



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Project: South Kingstown Hazard Mitigaiton Plan Updata
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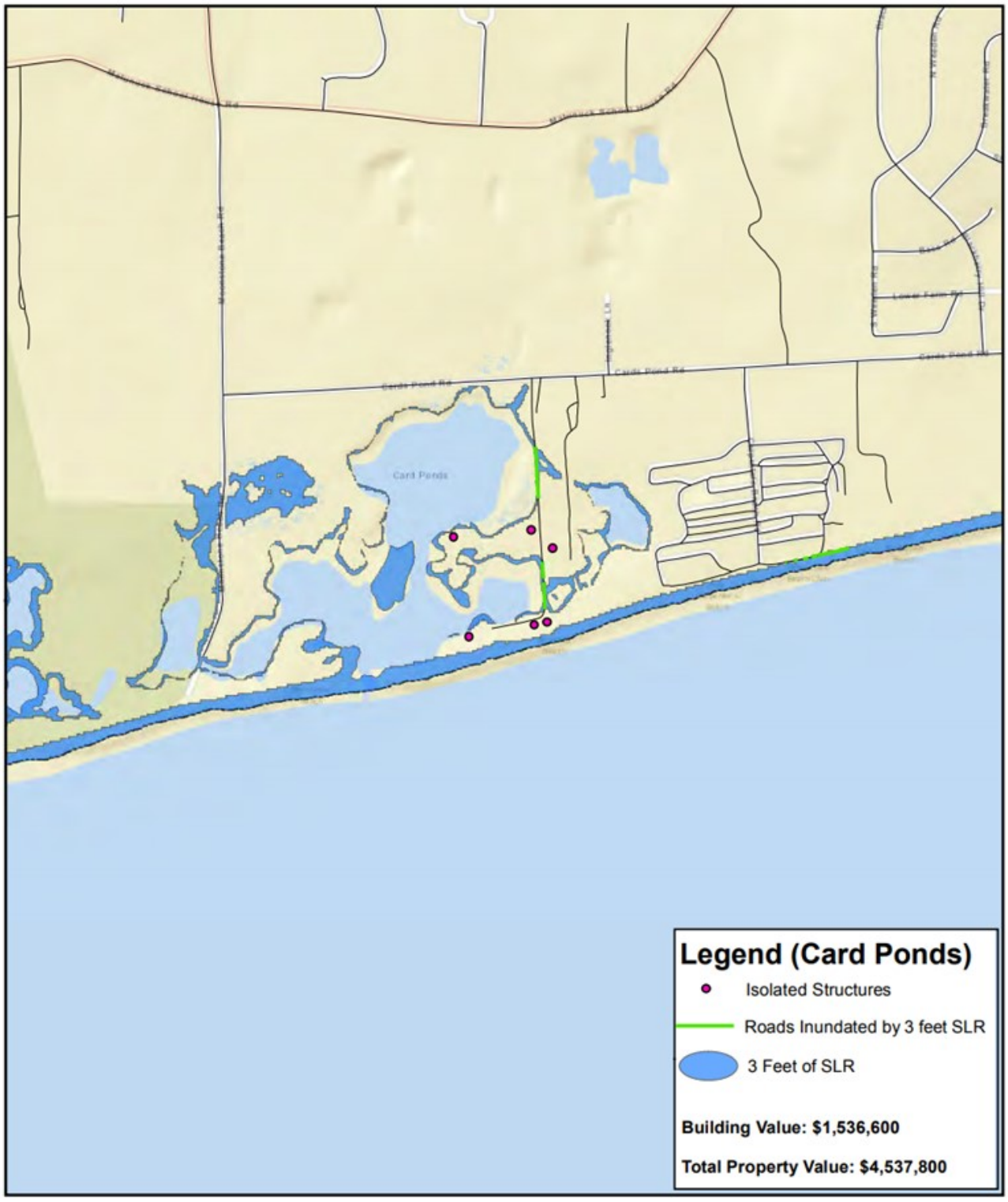

Scale

1 inch = 1,011 feet

C4: PROPERTIES THAT WILL BE ISOLATED BY ROADS INUNDATED BY 3 FEET OF SEA LEVEL RISE

South Kingstown, Rhode Island

0 0.25 0.5

Miles

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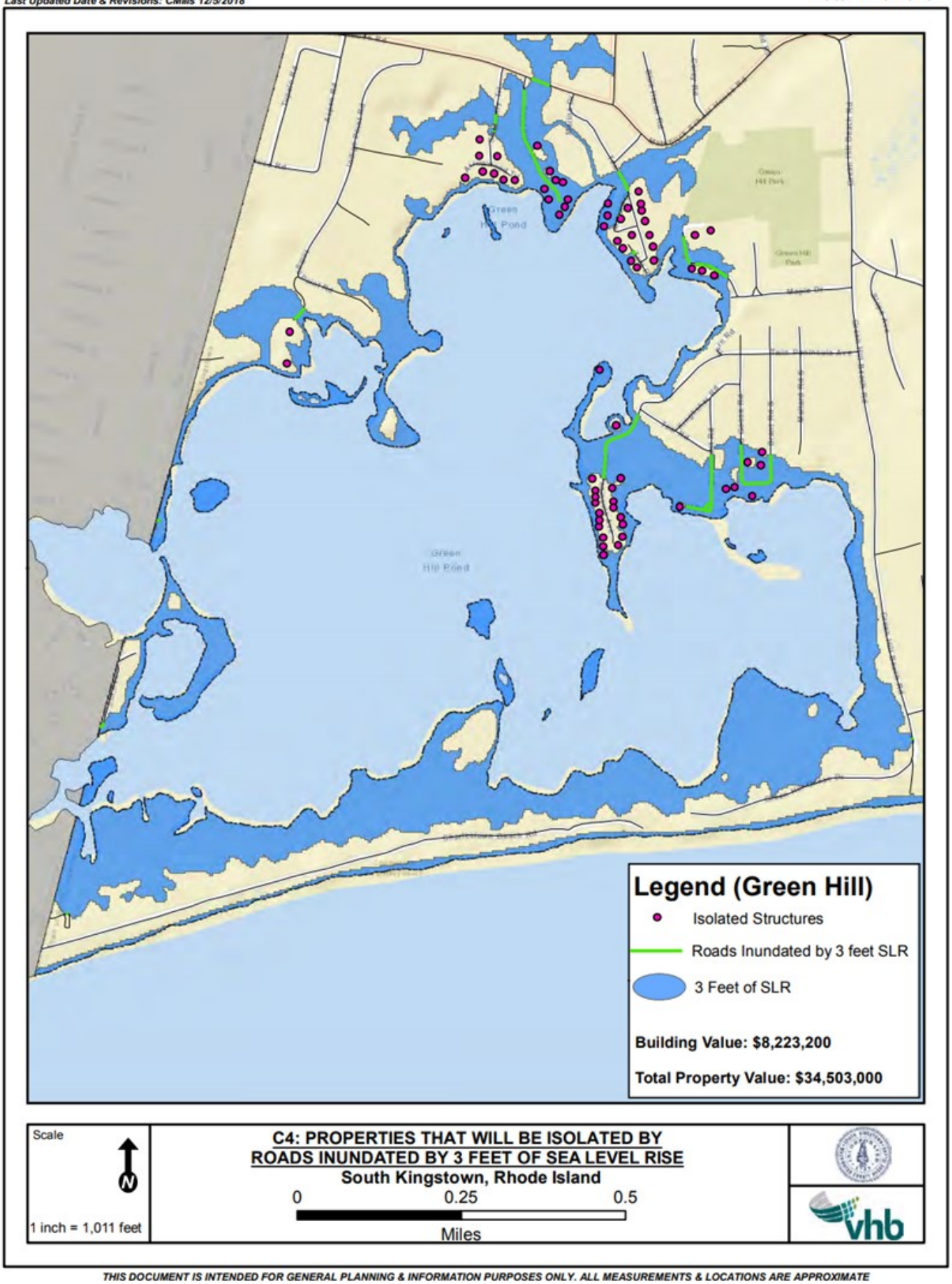
Project: South Kingstown Hazard Mitigaiton Plan Updata
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\SK Isolation.mxd
Last Updated Date & Revisions: CMills 12/5/2018
Date: 12/5/2018
Legend (Green Hill)
Isolated Structures
Roads Inundated by 3 feet SLR
3 Feet of SLR
Building Value: $8,223,200
Total Property Value: $34,503,000
Scale
1 inch = 1,011 feet
C4: PROPERTIES THAT WILL BE ISOLATED BY ROADS INUNDATED BY 3 FEET OF SEA LEVEL RISE
South Kingstown, Rhode Island
0
0.25
0.5
Miles
vhb
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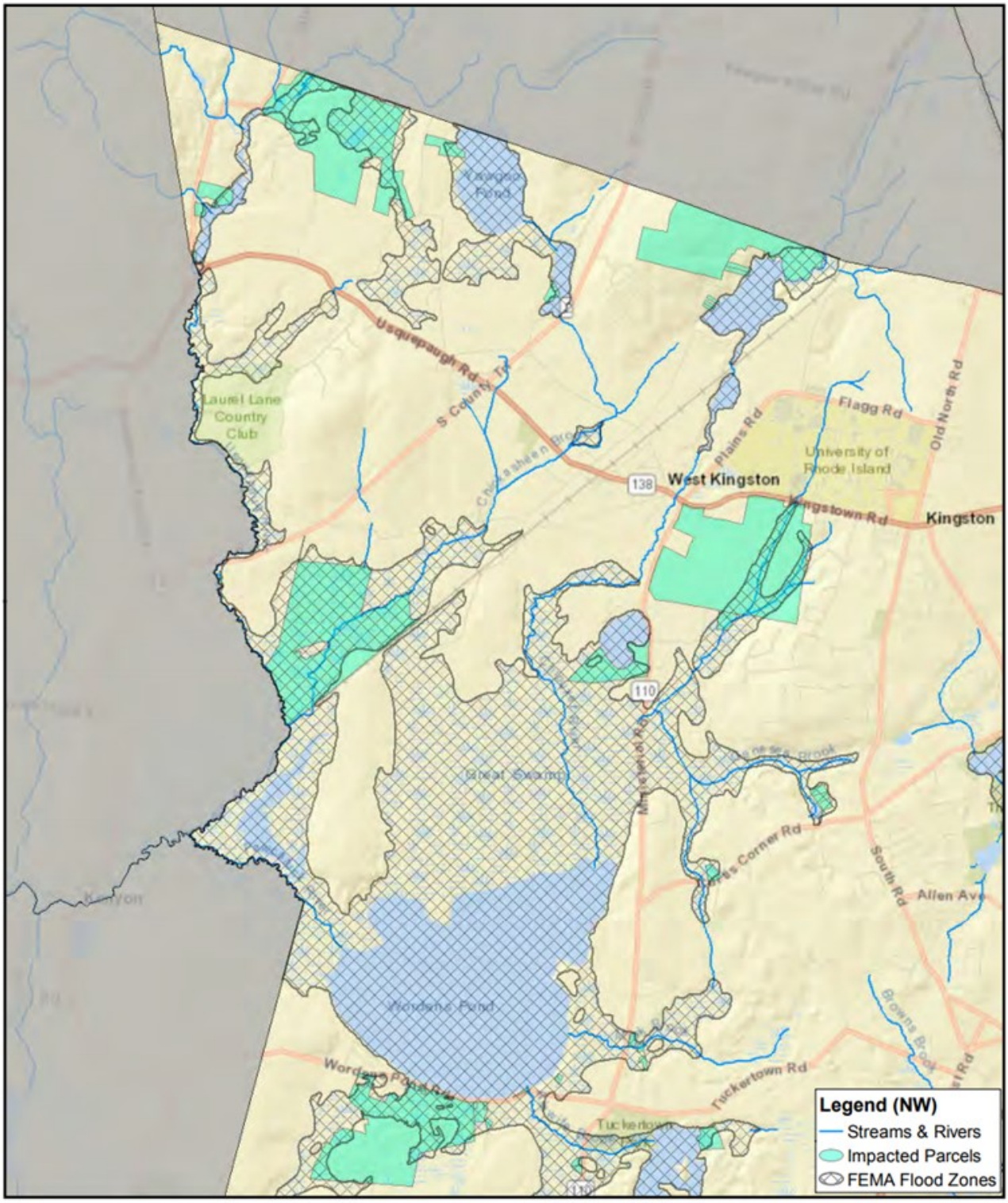
Project: South Kingstown Hazard Mitigaiton Plan Updata
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\Inland Flooding.mxd
Last Updated Date & Revisions: CMills 12/5/2018

Date: 12/5/2018



Scale

1 inch = 4,583 feet

C5: PARCELS WHOSE STRUCTURES ARE IMPACTED BY INLAND FLOODING FROM 1% ANNUAL CHANGE STORM

South Kingstown, Rhode Island

0 1 2

Miles

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Project: South Kingstown Hazard Mitigaiton Plan Updata
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\Inland Flooding.mxd
Last Updated Date & Revisions: CMills 12/5/2018

Date: 12/5/2018

Scale

1 inch = 4,583 feet

C5: PARCELS WHOSE STRUCTURES ARE IMPACTED BY INLAND FLOODING FROM 1% ANNUAL CHANGE STORM

South Kingstown, Rhode Island

0 1 2

Miles

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Project: South Kingstown Hazard Mitigaiton Plan Updata
File: \\vhb\gis\proj\Providence\72925.00\gis\Output\Inland Flooding.mxd
Last Updated Date & Revisions: CMills 12/5/2018

Date: 12/5/2018

Scale

1 inch = 3,333 feet

C5: PARCELS WHOSE STRUCTURES ARE IMPACTED BY INLAND FLOODING FROM 1% ANNUAL CHANGE STORM

South Kingstown, Rhode Island

0 1 2

Miles

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Project: South Kingstown Hazard Mitigaiton Plan Updata
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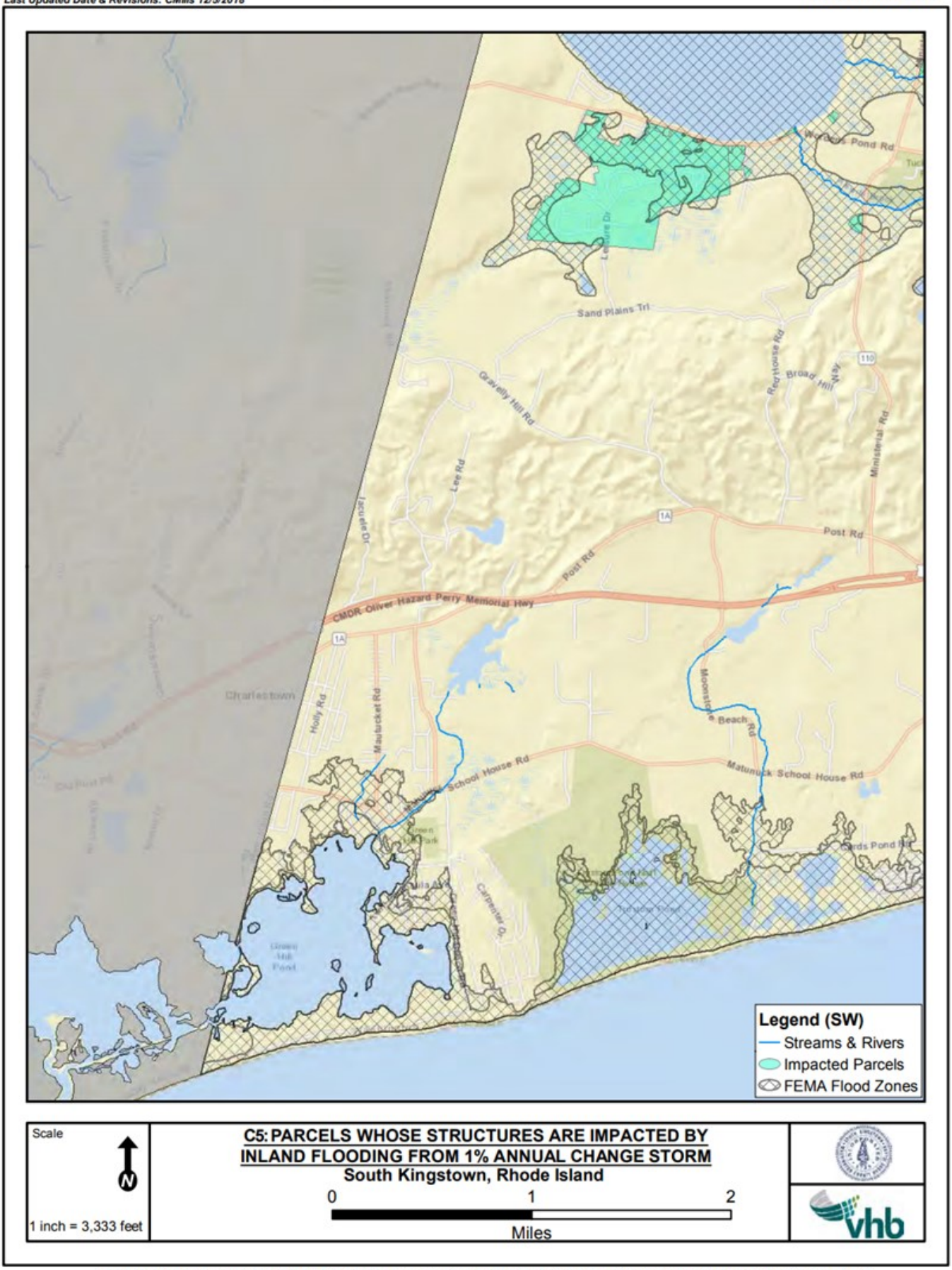
Date: 12/5/2018



Scale

1 inch = 3,333 feet

C5: PARCELS WHOSE STRUCTURES ARE IMPACTED BY INLAND FLOODING FROM 1% ANNUAL CHANGE STORM
South Kingstown, Rhode Island

0 1 2
Miles

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PHIL'S