

BEFORE THE ISLAND REGULATORY AND APPEALS COMMISSION

IN THE MATTER OF an appeal pursuant to s.29.1 of the *Environmental Protection Act*, RSPEI 1988 c. E-9 by Mark Keizer with respect to the denial of an application for a Watercourse, Wetland and Buffer Zone Activity Permit at PID #920934 located at 560 City View Drive, Mermaid, Prince Edward Island

**ADDITIONAL DOCUMENTS OF
THE MINISTER OF ENVIRONMENT, ENERGY AND CLIMATE ACTION**

Mitchell O'Shea
Legal Services
Justice and Public Safety
95 Rochford Street, PO Box 2000
Charlottetown, PE

**Solicitor for the Department of
Environment, Energy and
Climate Action**

Mark Keizer
560 City View Drive
Mermaid, PE
C1B 0V8

Appellant

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INDEX

<u>Tab</u>	<u>Description of Record</u>
1.	Email exchange with Corey MacFayden of Island Coastal Services Ltd.
2.	Coastal Hazard Assessment dated October 8, 2021
3.	Notes on Saltmarsh migration dated July 11, 2022

1

Dale Thompson

From: Dale Thompson
Sent: Friday, September 10, 2021 1:51 PM
To: Corey MacFadyen
Subject: RE: CLP Notification Form, Keizer, Mermaid - Ineligible work

Hi Corey,
No, due to the presence of the salt marsh,
Tks, Dale

From: Corey MacFadyen <CoreyM@islandcoastal.ca>
Sent: Friday, September 10, 2021 1:15 PM
To: Dale Thompson <DETHOMPSON@gov.pe.ca>
Subject: RE: CLP Notification Form, Keizer, Mermaid - Ineligible work

Dale,

Would the work be approved under the long form application in your opinion?

Corey M.

Corey MacFadyen
Island Coastal Services Ltd.
155 Belvedere Ave.
Charlottetown, PE
O (902) 892-1062
C (902) 218-0471
coreym@islandcoastal.ca

From: Dale Thompson <DETHOMPSON@gov.pe.ca>
Sent: September 10, 2021 1:04 PM
To: Corey MacFadyen <CoreyM@islandcoastal.ca>
Cc: Admin Office <adminoffice@islandcoastal.ca>
Subject: CLP Notification Form, Keizer, Mermaid - Ineligible work

Hi Corey,
Shoreline stabilization work **cannot** proceed on this property, as per the CLP Certification Manual, Page 36 which states that:

"1. Shoreline stabilization can be carried out on shorelines of tidal waters only. It may not be completed under the Contractor Licensing Program where the area at the base of the bank to be armoured is a wetland or sand dune."

There is a salt marsh at the base of the bank here.
Regards,

Dale Thompson
Environmental Assessment Officer

2

Dale Thompson

From: coastalproperty
Sent: Friday, October 8, 2021 8:22 AM
To: Dale Thompson
Subject: RE: PID # 920934, Mermaid
Attachments: CHA PID 920934 MAP.pdf; CHA PID 920934.pdf

Good morning,

Please find attached a Coastal Hazard Assessment for PID 920934.

Best regards,
Catherine

From: Dale Thompson <DETHOMPSON@gov.pe.ca>
Sent: Thursday, October 7, 2021 9:27 AM
To: coastalproperty <coastalproperty@gov.pe.ca>
Subject: PID # 920934, Mermaid

Hi Guys,
Wondering if you could please assess this property for erosion/flooding potential? We have denied a request for shoreline armouring of the property and are getting some push-back from the client/contractor. As soon as possible would be great.
Tks, Dale

Dale Thompson
Environmental Assessment Officer
PEI Department of Environment, Energy and Climate Action
(902)368-5049



Coastal Hazard Assessment

Property Identification Number (PID):	920934		
Civic Address/Lot Number:	City View Dr		
Community/Municipality:	Mermaid		
Shoreline Classification Type:	Wetland. Estuary exposure.		
Watershed Name:	Fullertons Creek	Watershed ID:	WS_63

Prince Edward Island’s coastline is ever-changing, shaped by the forces of wind, waves, tides, and changes in sea level. While coastal properties are valued by tourists and residents alike, as well as by many businesses, unfortunately coastal properties can also be vulnerable.

A Coastal Hazard Assessment (CHA) is intended as a guidance document for current and prospective property owners. The CHA provides you with information about the potential hazards associated with impacts of erosion and flooding along the coast, which can be used to guide decisions prior to purchasing or developing a coastal property. Coastal hazards are expected to worsen over time. Careful consideration should be given regarding any coastal property’s suitability for long-term development. If you are planning to purchase a coastal property, you are encouraged to inform yourself about previous occurrences of flooding and to check with your insurance agency about potential coverage. If you are planning to develop or subdivide a coastal property, you are encouraged to consult a design professional.

This CHA is based on interpretation of remotely-sensed data and climate modeling, and is not informed by a site visit to the property in question. The CHA provides information about the potential for impacts caused by coastal erosion and/or coastal flooding due to climate change. Damage to property assets, including but not limited to building structures and on-site services, are beyond the scope of this assessment. The CHA should not be considered to be a definitive statement as to where and when future damage may occur. It is strongly recommended that property owners engage a qualified professional regarding the design and location of any coastal development. The projected lifespan of your development, value of a structure, and your individual risk tolerance, should be considered when making decisions about the development of a coastal property.

Limitation of Liability: Government, its agents, representatives, and employees shall not be liable for any claims, demands, losses, costs, damages, actions, suits or proceedings of every nature and kind, whatsoever, arising out of or resulting from any reliance on the Coastal Hazard Assessment.

For more information about:

Coastal properties, please visit the PEI Coastal Property Guide: www.princeedwardisland.ca/en/publication/prince-edward-island-coastal-property-guide

The 15 m Environmental Buffer Zone, please visit: www.princeedwardisland.ca/sites/default/files/publications/watercourse_wetland_and_buffer_zone_activity_guidelines_de_c_206.pdf

How will PEI's coastline erode in the future?

As a result of climate change the sea level is rising, intense storms are occurring more frequently, and during the winter months there is less sea ice coverage. All of these factors are expected to lead to increased erosion in coastal areas in the future.

What is the Erosion Hazard Classification for a single property?

By using the average historical (1968-2010) rate of erosion, the level of hazard can be attributed to an individual property. Hazard classifications are as follows:

High Erosion Hazard:	more than 90 cm/yr
Moderate Erosion Hazard:	30-90 cm/yr
Low Erosion Hazard:	less than 30 cm/yr

This hazard classification is based on historical coastal change and is likely to be an underrepresentation of the future erosion rate (i.e., as the climate continues to change, the erosion rate is likely to increase). Furthermore, if the coastline of your property has been altered (e.g., shoreline armoring) the historic rate of erosion may not accurately reflect current conditions.

Please note that the historical rate of erosion is currently not available for coastlines adjacent to saltmarshes. Saltmarshes can provide a natural barrier between coastal properties and the impacts of storm surge flooding. Without interference from coastal development, saltmarshes are expected to expand (inland) as sea level continues to rise.

Coastal Erosion Hazard Assessment	
Average Coastal Erosion Rate (cm/year)	N/A
Maximum Coastal Erosion Rate (cm/year)	N/A
Coastal Erosion Hazard Classification:	N/A
Comments: This property is fronted entirely by a saltmarsh therefore a coastal erosion rate is not available.	

Is this property in a flood hazard zone?

PEI is fortunate to have access to detailed information on the elevation of all coastal properties. By using climate models of projected sea level rise, this information can be used to assess the coastal flood hazard of a single property.

High Flood Hazard:

This area of the property falls within the current (2020) coastal floodplain. This low lying coastal land may experience flooding now during extreme storm events, and will be impacted more often as sea level rises and storm water levels reach higher elevations more frequently. As mean sea level continues to rise, a portion of this area will be permanently inundated by sea water during regular high tides.

Moderate-High Flood Hazard:

This area of the property falls within the 2050 coastal floodplain. It is less likely that this area will experience flooding now, but the likelihood of flooding during an extreme storm event will increase over time.

Moderate-Low Hazard:

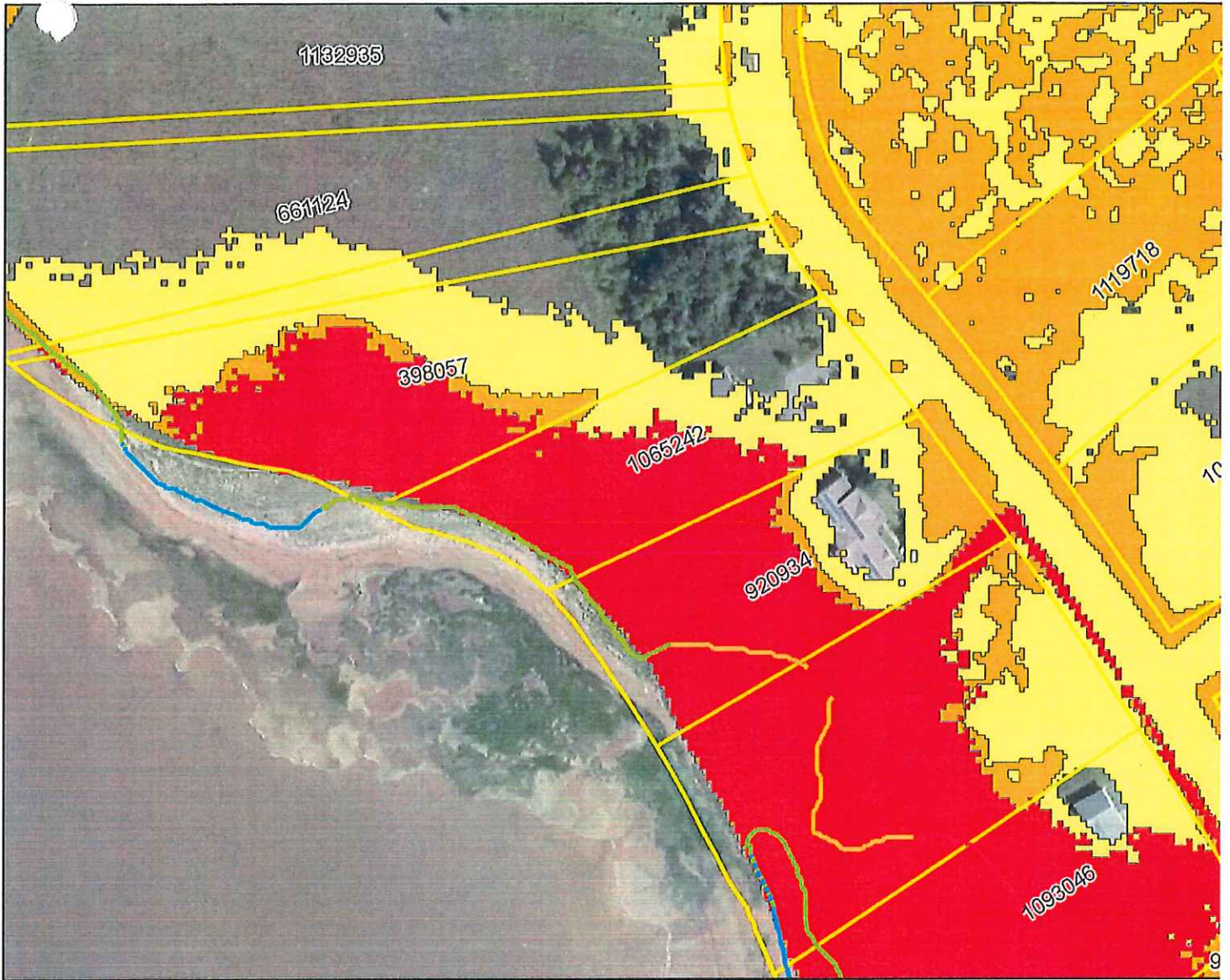
This area of the property falls within the 2100 coastal floodplain. It is unlikely that this area will experience coastal flooding now, but the likelihood of flooding during an extreme storm event will increase over time.

Minimal Flood Hazard:

This area of the property is elevated above the 2100 coastal floodplain.

Coastal Flood Hazard Assessment	
	Approximate area of the property within the hazard zone
High Flood Hazard:	60
Moderate-High Flood Hazard:	15
Moderate-Low Flood Hazard:	15
Minimal Flood Hazard:	10
Comments: Approximately 60% of this property falls within the High Flood Hazard Zone. A portion of this parcel is saltmarsh, which is expected to expand (inland) as sea level continues to rise. If available, local knowledge of previous occurrences of flooding will also help to inform the property owner regarding current and future flood risk.	

CHA PID 920934



October 8, 2021

Coastal Change

High Erosion Risk (>90cm/yr)

Mod. Erosion Risk (30-90cm/yr)

Low Erosion Risk (0-30cm/yr)

Accretion

Property

2020 Floodplain

2050 Floodplain

2100 Floodplain



This map is not intended

3

Dale Thompson

From: Hope Parnham
Sent: Monday, July 11, 2022 9:27 AM
To: Dale Thompson; coastalproperty
Cc: Erin Taylor; Catherine Kennedy
Subject: RE: LEV22-001-Mark Keizer v. Minister of Environment, Energy and Climate Action
Attachments: CHA and Salt Marsh Migration.docx

Hi Dale

Here's our notes on saltmarsh migration and some additional background information on how we conduct the Coastal Hazard Assessments.
Please let me know if you have any additional questions.

Hope

From: Dale Thompson <DETHOMPSON@gov.pe.ca>
Sent: Wednesday, June 29, 2022 9:22 AM
To: coastalproperty <coastalproperty@gov.pe.ca>
Cc: Erin Taylor <eotaylor@gov.pe.ca>
Subject: FW: LEV22-001-Mark Keizer v. Minister of Environment, Energy and Climate Action

Hi Catherine,

Mr. Keizer is appealing our decision to deny a recent request for a WWBZ Activity Permit to place shoreline protection material on this property (PID # 920934) for which you completed a CHA on Oct 8, 2021. I am wondering if you could please provide a few notes from a climate change perspective to refute Mr. Keizer's claims. I have a good start on this but would like your input if possible,
Tks, Dale

From: Collette Vessey <CVessey@irac.pe.ca>
Sent: Wednesday, June 22, 2022 8:53 AM
To: 'mrkkeizer@gmail.com' <mrkkeizer@gmail.com>; Dale Thompson <DETHOMPSON@gov.pe.ca>
Subject: LEV22-001-Mark Keizer v. Minister of Environment, Energy and Climate Action

Attached please find the following documents with respect to the above-noted appeal:

If you have any questions with respect to the attached, please contact Philip Rafuse at pjrafuse@irac.pe.ca.



Collette A. Vessey
Executive Assistant
Island Regulatory and Appeals Commission
134 Kent Street-Suite 501
Charlottetown, PE C1A 7L1
Tel: 902.368.7843
email: cvessey@irac.pe.ca

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Saltmarsh Migration and Coastal Squeeze due to Climate Change

Salt marshes develop near sea level under favorable conditions for plant growth and sufficient sediment supply. Once established, vegetation can accumulate large amounts of sediments that promote the formation of a marsh platform, the stability of which is increased by the shear strength of plant roots. Salt marshes represent areas of high biological productivity and also provide a natural barrier against the effects of sea level rise and storms. Additionally, they protect coastal zones through their aptitude to grow in elevation by trapping sediments. (Fagherazzi et al. 2020) The presence of coastal wetlands can reduce wave heights and property damage that result from storm surge activity (Johnson, 2019)

As sea level rises it will permanently flood low-lying coastal land and coastal saltmarshes will move landwards, this process is called saltmarsh migration. The gradual movement of a saltmarsh is a complex process regulated by storms that occasionally flood upland areas increasing soil salinity. As a result, upland vegetation (such as a lawn) is gradually replaced by salt-tolerant marsh plants. The land use and slope of the adjacent land are important factors that determine the rate of upslope migration of salt marshes. Once an area is salt-stressed, grasses are likely to die and be replaced by marsh plants relatively quickly. (Fagherazzi et al. 2019)

The process of saltmarsh migration is different from that of coastal erosion. In contrast, coastal erosion is the natural breakdown of rocks and soil on the coastline. Adaptation measures that address coastal erosion are not appropriate for shorelines subject to coastal flooding and salt marsh migration as they result in "coastal squeeze". Coastal squeeze is the term used to describe where sea level rise and hard defense structures (sea walls, shoreline armouring etc.) have caused a reduction in the space in the coastal zone, such as saltmarshes and beaches. The reduced space prevents the ecosystems ability to migrate and naturally adapt (Chávez, 2021), while also reducing the natural resilience of the saltmarsh to recover following storm events.

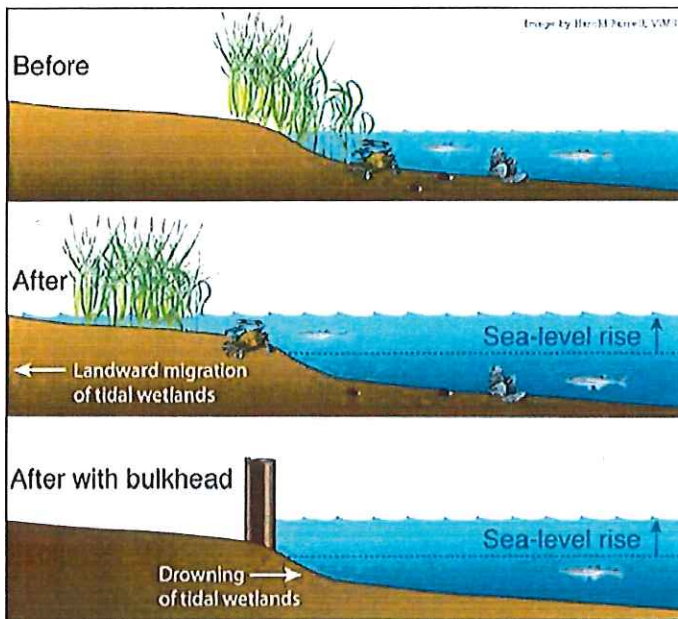


Image from: <https://www.fisheries.noaa.gov/feature-story/coastal-squeeze-changing-tactics-dealing-climate-change>

Coastal Hazard Assessment

A Coastal Hazard Assessment (CHA) provides a summary of erosion and coastal flood hazards associated with a coastal property. A CHA is based on the interpretation of remotely sensed data and climate modelling.

The historic rate of erosion is currently unavailable for coastlines adjacent to saltmarshes due to differences in the interpretation of the coastline for 1968 and 2010 for these shoreline types (Webster & Brydon, 2012; Webster, 2012). As such, a historic rate of erosion and erosion hazard classification were not provided in the CHA for the property in question.

To determine the coastal flood hazard for a property, high-resolution LiDAR data (collected in 2020) is used to identify the area of the property below a specified flood hazard elevation. The current (2020) and future floodplain elevations for the Fullerton Creek Watershed (WS_63), in which the parcel in question is located, were modeled by Davies and MacDonald (2021).

The CHA provides a plain language summary of the projected flood hazard for the property. More detailed information on the floodplain elevations is also available in a Watershed Flood Projections Report, which can be downloaded and is attached for your convenience.

For this property the land area below 2.23 m (CGVD2013) elevation is within the High Hazard area, also referred to as the 2020 coastal floodplain (1% Annual Exceedance Probability, AEP). Additional data layers included in the CHA map, include the Moderate-High Flood Hazard Zone (2050 floodplain), Moderate-Low Flood Hazard Zone (2100 floodplain), and an extreme or "worst-case" flood scenario. This scenario considers an extreme storm event in 2100, with a low probability of occurring (0.1% AEP, or the 1-in-1000-year event) and includes an additional 0.65m of sea level rise.

Chávez, V., Lithgow, D., Losada, M. *et al.* Coastal green infrastructure to mitigate coastal squeeze. *J Infrastruct Preserv Resil* 2, 7 (2021). <https://doi.org/10.1186/s43065-021-00026-1>

Davies, M.H., and N.J. MacDonald. (2021) *Prince Edward Island Coastal Hazards*. Coldwater Consultants. Report prepared for the Province of Prince Edward Island.

Fagherazzi S, Anisfeld SC, Blum LK, Long EV, Feagin RA, Fernandes A, Kearney WS and Williams K (2019) Sea Level Rise and the Dynamics of the Marsh-Upland Boundary. *Front. Environ. Sci.* 7:25. doi: 10.3389/fenvs.2019.00025

Fagherazzi, S., Mariotti, G., Leonardi, N., Canestrelli, A., Nardin, W., & Kearney, W. S. (2020). Salt marsh dynamics in a period of accelerated sea level rise. *Journal of Geophysical Research: Earth Surface*, 125, e2019JF005200.

Johnson, M.R., Boelke, C., Chiarella, L.A., and Greene, K. 2019. [Guidance for Integrating Climate Change Information in Greater Atlantic Region Habitat Conservation Division Consultation Processes](#). [Greater Atlantic Region Policy Series](#) 19 -01. NOAA Fisheries Greater Atlantic Regional Fisheries Office. 235p.

Webster, T., Brydon, C. (2012). Coastline Change in Prince Edward, 1968-2010 and 2000-2010, (February), 36.

Webster, T. (2012). Identification of Anomalous Coastline Change Areas and the Aggregation of Change Attributes for Littoral Cells, (January).

