SAUGEEN VALLEY CONSERVATION AUTHORITY

ADMINISTRATIVE REVIEW

Monday, November 22, 2021, 1:00 p.m.

AGENDA

File: Cedar Crescent Village

Applicant: Municipality of Saugeen Shores (Landowner)

Location: 122 Elgin Street
Roll No. 411046000335300
Plan 259, Harbour Block 2
Geographic Town of Port Elgin
Town of Saugeen Shores

1. Welcome and Introductions (5 minutes)

2. Declaration of Pecuniary Interest

3. Approval of September 7, 2021 Meeting Minutes

4. SVCA Report - Administrative Review – Application to Alter a Regulated Area
   (30-minute presentation, 10-minute question and answer period)

5. Town of Saugeen Shores Report – Administrative Review
   (30-minute presentation, 10-minute question and answer period)

6. Final Deliberations and Vote

7. Adjournment

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, publicinfo@svca.on.ca, www.saugeenconservation.ca

REPORT TO: Chair and Members, SVCA Executive Committee

FROM: Erik Downing, Manager, Environmental Planning and Regulations

DATE: November 15, 2021

RE: Administrative Review – Application to Alter a Regulated Area

APPLICANT: Town of Saugeen Shores (Applicant and Landowner)

LOCATION: 122 Elgin Street
Roll No. 411046000335300
Plan 259, Harbour Block 2
Geographic Town of Port Elgin
Town of Saugeen Shores (Cedar Crescent Village)

Application

The Applicant (Town of Saugeen Shores) has applied for permission to develop several buildings and structures including an event space, marketplace, and a restaurant, complete with volleyball courts, and public infrastructure (roads, sewers, water, parking) within SVCA's Regulated Area. A copy of the application is attached (Attachment 1). A portion of the proposed development is located within the flooding hazard and dynamic beach hazard of the Lake Huron Shoreline, which are regulated features by SVCA, in accordance with Ontario Regulation 169/06, as amended. Please see attached Cedar Crescent Village Concept Plan for your information (Attachment 2), and SVCA map showing the location of the development in relation to SVCA's regulated areas (Attachment 3).

The following documents have been requested by SVCA staff to complete the Town of Saugeen Shore's permit application so the authority can undertake an informed review of the impacts of the development on the control of flooding, erosion, pollution, dynamic beaches, and the conservation of land, in accordance with SVCA's policies made under Ontario Regulation 169/06.

1. Application Form and Fee,
2. Detailed Site Plan/Elevation Plan (floodproofing details), Engineered Drawings
3. Technical Studies:
    i. Flood Hazard Assessment,
    ii. Dynamic Beach Hazard Assessment, and
    iii. Flood and Erosion Impacts

The Applicant has submitted Item no. 1. Regarding Item 2, on Thursday, April 29th, 2021, the Applicant communicated that submitting the remainder of these materials simultaneously would be problematic as the

results and approval of the flood hazard assessment, for example, would impact the preparation of the site plan and engineering drawings. As such, SVCA and the Applicant mutually agreed that the elements of the complete application would be submitted in two components: the flood hazard and dynamic beach assessments, followed by the remainder of the materials once the assessments had been approved by SVCA.

In general, SVCA staff are satisfied with the statistical analysis of the flood hazard assessment (Item # 3i.) undertaken by the Applicant's consultant, and as such, we consider this requirement met. However, a Dynamic Beach Hazard Assessment (item # 3ii.) has not been completed to SVCA staff's satisfaction given that SVCA's mapping shows that a portion of the proposed development is located within the dynamic beach hazard limit. Although some information has been submitted by the Applicant, it is our opinion that their submission does not constitute a Dynamic Beach Hazard Assessment because the report submitted to SVCA did not provide acceptable scientific or engineering justification to substantiate eliminating or reducing the dynamic beach allowance, or an assurance that such is feasible (in accordance with *TECHNICAL GUIDE FOR GREAT LAKES - ST. LAWRENCE RIVER SHORELINES*). As such, it is staff's opinion, the application is not complete without a Dynamic Beach Hazard Assessment that is acceptable to SVCA staff.

Administrative Review

Section 7.3.3 of Appendix J of the SVCA Environmental Planning and Regulations Policies Manual, states:

> *If not satisfied with the decision on whether an application is deemed complete, the applicant can request an administrative review by the CA General Manager (GM) and then if not satisfied, by the CA Board of Directors. This review will be limited to a complete application policy review and will not include review of the technical merits of the application.*

Therefore, the purpose of an Administrative Review is to determine whether an Application can be considered complete in its current form and should not consider whether an Application can be approved based on technical information submitted. If an Application is considered complete and staff are not able to approve the Application, a Section 28 Hearing may be requested.

Notwithstanding the above, for the Executive Committee to decide on the completeness of this application, there is the need for a brief summary of the technical submission to date because both parties (Applicant and SVCA) are at an impasse as to what constitutes a Dynamic Beach Hazard Assessment. The importance of submitting a technically accurate study to SVCA's satisfaction is critical for evaluating the impacts of the proposed control of flooding, erosion, pollution, dynamic beaches, or the conservation of land.

The applicant was first advised on the incompleteness of their application on March 29, 2021, which included SVCA staff recommendation for the Dynamic Beach Hazard Assessment. A timeline of the CCV application review is attached for your reference (Attachment 4) and a brief summary of correspondence is outlined below in the 'Dynamic Beach Hazard Assessment' section of this report. In general, the Applicant does not agree with SVCA staff's recommended methodology for the Dynamic Beach Assessment and on August 17, 2021, the Applicant formally requested an Administrative Review and Section 28 Hearing simultaneously.

In accordance with the above-mentioned policy, SVCA GM/S-T undertook her administrative review and advised the applicant on August 27, 2021, that it is not possible for these two processes to take place at the same time as they serve separate and distinct purposes; and further that, a Section 28 Hearing has legal standing, while an administrative review does not. A copy of the SVCA's GM/S-T report is attached for your information. It was recommended by the SVCA GM/S-T that an Administrative Review of the completeness of

the CCV application be conducted by SVCA's Executive Committee because a Dynamic Beach Hazard Assessment (Item #3ii.) has not been completed to staff's satisfaction (Attachment 5).

Dynamic Beach Hazard Assessment

In accordance with SVCA's Environmental Planning and Regulations Policies Manual, Policy 4.8.3.2, development within the Dynamic Beach Hazard is generally not permitted, with exceptions for underground public infrastructure and conservation/restoration projects, subject to the activity being approved through a satisfactory Environmental Assessment (EA) process and/or if it has been demonstrated to the satisfaction of SVCA that the control of flooding, erosion, pollution, dynamic beaches or the conservation of land will not be negatively affected. Reconstruction of existing buildings or structures and development of passive public recreational use may be permitted also if the five regulatory tests noted above are met to SVCA's satisfaction.

In this case, the Applicant proposes hardened public infrastructure including roads, parking, and potentially a covered patio within the SVCA mapped dynamic beach hazard limit, which are not permitted according to the above policy. As such, SVCA staff's rationale behind requiring a Dynamic Beach Hazard Assessment is to:

a) Obtain more specialized, technical information from a qualified professional regarding the location of the dynamic beach hazard limit. The current SVCA mapped limit is a regulatory standard, and a focused study would refine the hazard at the subject location.
b) Once the hazard limit has been confirmed via satisfactory scientific or engineering justification, and if the proposed development remains within that limit, it can be determined if the proposed development would have an adverse impact on the control of flooding, erosion, dynamic beaches, or the conservation of land tests of Ontario Regulation 169/06, as amended.

If the results of dynamic beach hazard assessment show a reduction of the dynamic beach limit, and it is demonstrated the proposed development would not impact the control of flooding, erosion, dynamic beaches, and the conservation of land, SVCA staff could support the proposed development adjacent to this feature. If not, and the Applicant requests a Section 28 Hearing, the technical analysis on the impacts of the development would be presented to the Hearing Board to make an informed decision about the risks of the development.

Staff's discretion to request technical reports is provided by the SVCA Environmental Planning and Regulations Policies Manual (October 16, 2018), specifically Section 7.3.4 of Appendix J states:

> *During the review of a 'complete application', a CA may request additional information if the CA deems a permission (permit) application does not contain sufficient technical analysis.*

Staff's request for technical information is further supported through legislation, specifically Section 4 of Ontario Regulation 169/06, which states;

> *A signed application for permission to undertake development shall be filed with the Authority and shall contain the following information:*
>
> *1. Four copies of a plan of the area showing the type and location of the proposed development.*
> *2. The proposed use of the buildings and structures following completion of the development.*
> *3. The start and completion dates of the development.*
> *4. The elevations of existing buildings, if any, and grades and the proposed elevations of buildings and*

grades after the development.
5. Drainage details before and after the development.
6. A complete description of the type of fill proposed to be placed or dumped.
***7*. Such other technical studies or plans as the Authority may request. O. Reg. 169/06, s. 4; O. Reg. 79**

As noted, items 1 – 6 have been requested, in general, and are not subject to this review. The above reference is for information on the legality of staff's request for technical studies.

On June 19, 2019, SVCA staff advised the Applicant that development within the Dynamic Beach Hazard was not supported by SVCA's policies; and that development should be located outside the Dynamic Beach Hazard Limit mapped by SVCA. Staff further advised that the Applicant could complete a coastal study to determine if the dynamic beach hazard was located appropriately, which depending on the results of the study could be reduced in favour of their application. The Applicant's "Beach Hazard Assessment" was completed in October 2020 and submitted to SVCA via formal application on February 1, 2021.

SVCA retained the services of a coastal expert, Peter Zuzek (a copy of Mr. Zuzek's CV is attached for your information) (Attachment 6) to review the Town's submission. In consultation with Mr. Zuzek, SVCA staff found the Dynamic Beach Hazard Assessment incomplete because the Applicant's report did not provide scientific or engineering justification to substantiate eliminating the 30 m dynamic beach allowance. As such, on March 29, 2021, SVCA staff asked that the Applicant's proposal to reduce the Dynamic Beach Hazard limit be demonstrated accordingly. On April 22, 2021, in response to SVCA's March 29, 2021, correspondence, the Applicant provided further written explanation that justifies, in their opinion, a reduction of the dynamic beach hazard limit. However, the information provided to SVCA staff did not contain technical data or a study to staff's satisfaction that substantiated their position. Therefore, on May 12, 2021, and at the request of the Applicant, SVCA staff provided the following methodology that, in our opinion, would qualify as an acceptable methodology for assessing the dynamic beach hazard limit:

1. A long-term shoreline change analysis is required to evaluate beach stability over the full range of water level conditions using historical aerials (e.g., 1970s and 1980s) and recent orthophotography.
2. Given winter ice cover has already decreased on Lake Huron and further reductions are projected. Analysis of future beach stability for ice-free winters and exposure to storms 365 days of the year is required.
3. This work and other potential analysis is required to evaluate a potential reduction in the 30 m dynamic beach allowance.

On June 4, 2021, the Applicant responded to SVCA's recommendation above and advised "The town does not agree with the suggested approach to assessing the Dynamic Beach Hazard and we have not authorized this additional work". The applicant further outlined their reasoning for this position, where in their opinion, the limit of the Dynamic Beach ends at a "hardened" structure, which is the walkway / promenade immediately northwest of the subject property (Attachment 7). However, this "hardened" structure is also under debate as it is SVCA staff's opinion this interlocking brick pathway is not substantive enough to withstand dynamic beach, or wave uprush processes during periods of high lake level. Therefore, SVCA staff recommend the assessment of the Dynamic Beach Hazard ignore this walkway as in storm events it is not anticipated to provide any protection from lake erosion or processes.

Maintenance of the pathway, beach, and parking area have also been referenced by the Applicant as reasons why the area should no longer be considered dynamic. SVCA staff have responded that the appropriate study

could still be completed to determine the site-specific dynamic beach boundary given existing conditions and details of the shoreline. The maintenance conditions (existing and proposed) can then be considered relative to that report's findings and hazard location.

SVCA staff have been in discussions with the Applicant since June 4, 2021, to consider the potential of relocating the northern limit of the walkway further inland and renourishing the beach in this area to increase resilience of the beach. However, this work, as beneficial as it would be to the beach at this location, is not a substitute for the technical analysis required to reduce the dynamic beach limit from what is currently mapped by SVCA.

Therefore, it remains staff's opinion, the above-recommended methodology for the Dynamic Beach Hazard Assessment is required to complete this application because it is currently proposed to site a roadway, parking area, and potentially a covered patio within SVCA's dynamic beach hazard limit. Without this assessment, a reduction in the dynamic beach hazard limit is not justified. Should this application proceed to a Section 28 Hearing for a decision, it is staff's opinion, there is not enough analysis to effectively evaluate the impacts of the development on the control of flooding, erosion, pollution, dynamic beaches, or the conservation of land as mandated in Section Ontario Regulation 169/06.

Section 3 (1) of Ontario Regulation 169/06 states,

> ***Permission to develop***
> ***3.*** *(1) The Authority may grant permission for development in or on the areas described in subsection 2 (1) if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development. O. Reg. 169/06, s. 3 (1).*

Conclusion

The Applicant and SVCA staff are at an impasse on the technical analysis required to evaluate the appropriateness of the existing dynamic beach hazard limit and mapping (Attachment 8). This analysis, if undertaken as recommended by SVCA staff, should demonstrate if the proposed development would have an impact on the control of flooding, erosion, pollution, dynamic beaches, or the conservation of land. The technical analysis could also investigate restoration alternatives for the coastal dune and vegetation that would increase the resilience of the beach and its ability to recover from lake levels and storms, which would further protect the adjacent proposed development.

However, without a clear understanding obtained through an acceptable technical study of the potential impacts of the development on the above five regulatory tests, there could be a risk to life, property damage, and to the conservation of land (stability and health of the beach ecosystem) resulting from the development. As such, it is the opinion of SVCA staff that the Dynamic Beach Hazard Assessment be undertaken to SVCA's satisfaction to complete this application, or that the development proposal avoids this hazardous area. Attached you will find, for your information, copies of both SVCA's and the Applicant's Expert reports that have been highlighted to draw your attention to SVCA's technical requirements for a Dynamic Beach Assessment.

List of Attachments

1) Application
2) Cedar Crescent Village Concept Plan
3) SVCA Regulatory Map
4) Application Review Timeline
5) General Manager/Secretary Treasurer Administrative Review
6) Peter Zuzek CV
7) Photographs of Hardened Walkway
8) SVCA and Town of Saugeen Shores Technical Reports - Dynamic Beach Assessment – Technical Requirements

ATTACHMENT 1

1078 Bruce Road 12
Box 150
Formosa, ON N0G 1W0

SAUGEEN VALLEY CONSERVATION AUTHORITY (SVCA)

APPLICATION TO ALTER A REGULATED AREA

Ontario Regulation No. 169/06, and amendments thereto,
Conservation Authorities Act, R.S.O., 1990, Chap. C.27, as amended.

Application No.

For Office Use

The SVCA will consider your proposal based upon the information that you provide in this application.
Please ensure that your proposal is clearly described and that all relevant information is included. Additional pages may be submitted as needed.

LANDOWNER INFORMATION

Name(s)	The Corporation of the Town of Saugeen Shores	Phone	(519) 832-2008
Mailing Address	600 Tomlinson Drive, P.O. Box 820	City/Town	Port Elgin, Ontario
Email	Jay Pausner <jay.pausner@saugeenshores.ca>	Postal Code	N0H 2C0

APPLICANT INFORMATION

[X] Applicant is the Landowner or one of the Landowners; or

[ ] Applicant is acting on behalf of the Landowner(s) and has submitted written authorization from the Landowner(s) to SVCA.

Applicant Name	Jay Pausner	Company Name	Town of Saugeen Shores
Email	jay.pausner@saugeenshores.ca	Phone	519-832-2008

LOCATION OF PROPOSED PROJECT

Street Address	122 Elgin Street	Municipality/Town	Town of Saugeen Shores, Port Elgin
Lot(s) and Concession(s)	Harbour Block 2	Lot and Plan No.	Registered Plan Number 259
Other Location Information		Roll No.	

PROJECT DATES

Proposed Start Date	May 1, 2021	Proposed Finish Date	June 1, 2022

COMPLETE IF CONSTRUCTION PROPOSED

Type of Project or Work Proposed	New buildings, site works and building services with landscaping, walks and terraces.		
Intended Use of Building/Structure	Event Hall, market and commercial spaces	Present Use of Building/Structure	No existing buildings
Square Footage (All Floors) of Existing	0	Square Footage (Footprint Only) of Existing	0
Square Footage (All Floors) of Proposed	5226 sq. m Incl. terraces	Square Footage (Footprint Only) of Proposed	2852 sq m incl. terraces

What is the height difference between the ground & the proposed building's lowest exterior opening (e.g. door, window, vent)?
Approximately 1 m - buildings will be constructed on raised fill; final elevation varies with existing gradients.

Basement/Cellar Proposed Yes [ ] No [X]	Crawlspace Proposed Yes [ ] No [X]	Deck/Porch Proposed Yes [X] No [ ]

Equipment to be Used (e.g. excavator, bulldozer, etc.) Excavator, bulldozer, dump trucks, concrete truck, concrete pumper truck, etc.

Any Other Relevant Information
Applicant has leased a portion of the referenced land from the Landowner who is the Town of Saugeen Shores.

COMPLETE IF FILLING, GRADING OR EXCAVATION ARE PROPOSED

Purpose of Filling/Grading/Excavation	to establish a floor and landscaping elevation above the 100-year flood hazard identified.		
Intended Use of Land When Finished	New commercial buildings, food services, event hall, outdoor terraces, outdoor recreation.		
Volume of Fill to Add to Site	To be determined	Type of Fill and Source	To be determined.
Volume of Fill to Remove from Site	Minimal - organics, only	Excess Fill or Spoil Relocated To	To be determined.

How much higher or lower will the proposed ground elevation be compared to existing? Approximately 1 m.

(**See Other Side**)

EROSION AND SEDIMENT CONTROL

Proposed Method(s) of Erosion and Sediment Control During and After Construction

Silt fencing designed and erected to Ontario Provincial Standard Details. Local sumps used during construction with local shoring of excavations.
Post-Construction: permanent paving and landscaping with permanent storm drainage system piped to Municipal outlet.

PLANS

A site plan must be included with your application. Check [√] each box to confirm it is on the plans:

(One copy of each plan or drawing is to be submitted. Additional copies must be provided if requested by the SVCA).

- [ ] 1. Property dimensions.
- [ ] 2. Nearest streets, roadways, laneways etc.
- [ ] 3. Watercourses on or near the property.
- [ ] 4. Existing buildings and structures and distance to lot lines, centre of road, watercourse etc.
- [ ] 5. Proposed building or structure and dimensions including decks or porches.
- [ ] 6. Proposed location of filling, area of excavation, dimensions and depths (if applicable).
- [ ] 7. Elevation of finished floor, basement/crawlspace, any windows, doors, vents, or other exterior openings in relation to finished grade
- [ ] 8. Septic bed including mantle (if applicable).
- [ ] 9. North arrow.
- [ ] 10. Other relevant site features.

drawings and land survey sent previously.

Additional plans or drawings should be included showing side views, cross-section, building foundation (if applicable) and details.

IMPORTANT INFORMATION

- No work can be carried out until a permit is issued by the SVCA and all other necessary approvals are obtained.
- A non-refundable Application Review Fee must be paid when the application is submitted to the SVCA office. Several methods of payment are accepted. Cheques may be made payable to "Saugeen Valley Conservation Authority".
- The applicant is responsible for obtaining any other agency, government or municipal approvals as may be required.
- The information obtained on this application is a public record collected under the authority of the *Conservation Authorities Act* and is accessible upon request in accordance with the *Freedom of Information and Protection of Privacy Act*.

DECLARATION

Read Carefully Before Signing

- I declare the information in this application to be true;
- I agree to allow authorized representatives of the SVCA to enter onto the property to review this application;
- I recognize and accept that the information in this application is a public record and some or all of it may be released; and
- I understand that the payment of the fee does not guarantee permission from the SVCA.

Applicant Name (Print) X Jay Pausner

Applicant Signature* X Jay Pausner Date February 1, 2021

** Typed name will indicate a signature on digital applications.*

DO NOT WRITE IN THIS SPACE	
Fee Amount Received	Date Application Received

ATTACHMENT 2

1 SITE PLAN
1 : 500

G.M. DIEMERT ARCHITECT INC.
SUITE 201, 957 FOURTH AVE EAST
OWEN SOUND, ONTARIO N4K 2N9
(519) 376-1975

Cedar Crescent VILLAGE

OVERALL SITE PLAN

2021.03.17

ATTACHMENT 3

Legend

- Property Limit
- SVCARegulatoryLimit_approx
- Dynamic Beach Hazrd Limit
- CCVFloodHazApprox

CEDAR CRESCENT VILLAGE
PORT ELGIN BEACH
TOWN OF SAUGEEN SHORES

N

1:1000

UTM Zone 17N, NAD 83

SAUGEEN CONSERVATION

Figure 1

ATTACHMENT 4

CEDAR CRESENT VILLAGE REVIEW TIMELINE

DATE	SAUGEEN SHORES	Days Lapsed (Includes Weekends)	SVCA	Days Lapsed (Includes Weekends)	Within Current SVCA Timelines?	Comments
June 7, 2019	First contact with SVCA – Preliminary Site Plan submitted					
June 19, 2019			Letter sent – notes constraints – structures should be directed outside hazard lands.	12	Yes (21 days from contact to confirm application requirements)	SVCA current timelines met.
December 16, 2019		174	Staff reaches out to SS (L. White) as a result of numerous public complaints/inquiries. Staff informed by public CCV plans being presented to Council. SVCA staff resent June 19, 2019, letter for info for meeting. **File on hold – waiting for SS contact**			
March 6, 2020		81 **(255)**	Staff contacts SS (Pausner) via email regarding new 100 yr lake level mapping. Portion of proposed developable area in flood hazard. – SVCA staff request for meeting to discuss technical studies required (i.e., coastal report) based on new information. **File on hold – waiting for SS contact**			
May 10, 2020	Coastal Engineer (Baird) contacts SVCA with request for SVCA (TOR)	65				
May 11, 2020			SVCA responds to Coastal Engineer with TOR **File on hold – waiting for SS contact**	1		
September 8, 2020	Coastal Engineer (Shoreplan) request for information/ TOR	120				

DATE	SAUGEEN SHORES	Days Lapsed (Includes Weekends)	SVCA	Days Lapsed (Includes Weekends)	Within Current SVCA Timelines?	Comments
September 10, 2020			SVCA responds to Shoreplan via email with TOR for coastal report **File on hold – waiting for SS contact**.	2		
January 7, 2021	SS sends site plan and Coastal Report to SVCA. Request for application and fee amount.	119	SVCA acknowledges site plan and report, asks about planning apps.			
January 8, 2021			SVCA advises Coastal Report to be peer reviewed.	1		
January 25, 2021	SS (Pausner) emails SVCA – update on peer review.		SVCA staff advises – waiting on Management approval for peer reviewer quotes.			
January 25, 2021			SVCA retains Zuzek Inc. for coastal peer review.	0		
February 1, 2021	**Formal SVCA application submitted**	31 **(335)**				
February 25, 2021			SVCA receives Zuzek peer review report	24		
March 3, 2021			SVCA forwards Zuzek Peer Review report to SS, with standard letter regarding application completeness. Application not complete due to technical information needing clarification. **File on hold – waiting for SS complete application.**	6 (30)	No (21 days from application submission to determine if application complete)	Wait for peer review comments. Staff time to review and prepare SS response letter.
March 11, 2021	Zoom Meeting with SS to discuss letter and technical requirements for complete application – SS **requests a revised letter** from March 3, 2021.			8		

DATE	SAUGEEN SHORES	Days Lapsed (Includes Weekends)	SVCA	Days Lapsed (Includes Weekends)	Within Current SVCA Timelines?	Comments
March 29, 2021			SVCA sends revised Letter clarifying details needed to deem SVCA's application complete. **1. Technical Documents/Review** **a. Flood Hazard Assessment** **b. Dynamic Beach Hazard Assessment** **c. Impacts to Property / Public Safety Concerns** **d. Adjacent land Impacts** **2. Final Site Plan / Grading Plan** **3. Construction/Engineering Drawings** **File on hold – waiting for SS complete application.**	18		
April 22, 2021	SS (Froese) submits response to Zuzek Peer Review (Feb 2021)	32				
April 29, 2021	Zoom Meeting with SS to discuss SVCA / Zuzek review of SS/Shoreplan response			7		
May 12, 2021			SVCA sends Letter as follow up from April 29 meeting – Technical issues to be addressed by Shoreplan. Complete application requirements same as March 29, 2021 correspondence. Staff agree items 1 c) d), 2, & 3 to be completed after 1 s) 7 b). **File on hold – waiting for SS complete application.**	13 (20)	Yes (21 days from submission to determine if application complete)	
June 4, 2021	SS sends response to SVCA May 12, 2021, letter	26	SVCA forwards SS response to Zuzek inc. for comments. • SS agrees to Flood Hazard Study • SS does not agree to technical parameters for Dynamic Beach Hazard Assessment as requested by SVCA staff.	0		
July 7, 2021			SVCA staff contact Zuzek Inc. for update of review	30		
July 12, 2021			Zuzek Inc. provides SVCA preliminary comments of SS June 7 response.	5	No (21 days from submission to determine if application complete)	SVCA staff waiting on peer reviewer.

DATE	SAUGEEN SHORES	Days Lapsed (Includes Weekends)	SVCA	Days Lapsed (Includes weekends)	Within Current SVCA Timelines?	Comments
July 15, 2021			SVCA staff Meeting with Zuzek Inc. to discuss SS June 4, 2021 Response - Staff propose meeting with Town to discuss technical concerns	2		
July 22, 2021			SVCA sends letter on Application Completeness – • Staff satisfied with Flood Hazard Assessment, in general • Application not complete without dynamic beach assessment (in accordance with SVCA technical parameters) • Outline steps for Administrative Review. **File on hold for Administrative Review**	7 (44)	No (21 days from submission to determine if application complete)	SVCA staff waiting on peer reviewer. SVCA staff vacation time
July 23, 2021	Zoom Meeting with SS to discuss SVCA July 15, 2021. Technical discussions on Dynamic Beach constraints and complete application.					
August 17, 2021	SS (Froese) sends letter requesting Admin Review & Section 28 Hearing.	26				
August 27, 2021			SVCA (Stephens) sends letter RE: Admin Review to go to Exec. Committee – Sept. 7, 2021. S. 28 Hearing to be held on separate date.	10	n/a	

ATTACHMENT 5

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, publicinfo@svca.on.ca, www.svca.on.ca

SENT BY E-MAIL ONLY (kara.vanmyall@saugeenshores.ca)

August 27, 2021

The Corporation of the Town of Saugeen Shores
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON
N0H 2C0

Dear Ms. Van Myall:

RE: Request for Administrative Review and Section 28 Hearing
Cedar Crescent Village Permit Application (122 Elgin Street, Port Elgin)
122 Elgin Street
Roll No. 411046000335300
Plan 259, Harbour Block 2
Geographic Town of Port Elgin
Town of Saugeen Shores

Saugeen Valley Conservation Authority (SVCA) staff acknowledges receipt of your letter, dated August 17, 2021, requesting an Administrative Review and Section 28 Hearing under the *Conservation Authorities Act* regarding the proposed Cedar Crescent Village (CCV) development.

In your correspondence of August 17, 2021, the Town requested that an Administrative Review and Section 28 Hearing be conducted simultaneously. It is not possible for these two processes to take place at the same time as they serve separate and distinct purposes. Further, one of these processes has a legal standing, while the other does not.

- An Administrative Review is the avenue used when staff feel the permit application submitted by an applicant is incomplete and the applicant is of the opinion that the application is complete.

- A Section 28 Hearing is the avenue used when staff are in a position where they have all the components necessary to render a decision, however, they cannot approve the

permit application based on the development affecting the control of flooding, erosion, dynamic beaches and/or pollution.

As indicated in our last correspondence to the Town of Saugeen Shores, dated July 22, 2021, SVCA cannot deem the CCV permit application complete as a satisfactory dynamic beach hazard assessment was not completed. **Therefore, to move this file forward, it would be appropriate to move to an Administrative Review of the materials submitted.**

The option of having an Administrative Review where the completeness of a permit application is in question is outlined in correspondence sent to the Town on June 19, 2019, March 3, 2021, May 21, 2021, and July 22, 2021. The first step of the Administrative Review process is a review by the General Manager/Secretary-Treasurer to ascertain whether there is support for staff's rationale for the application being incomplete.

I have reviewed the materials submitted by the Town of Saugeen Shores, as well as all correspondence sent by Saugeen Valley Conservation Authority to the Town to effectively make my decision. SVCA staff have communicated that they require a permit application, the permit fee, and several technical documents to complete a fulsome review of the CCV development proposal. These technical documents include a flood hazard assessment, a dynamic beach assessment, adjacent flood and erosion impacts and floodproofing details, and site plan/draft master plan and engineering drawings. For the CCV Permit Application, SVCA staff recommend that these technical documents are necessary to formulate a complete application. On Thursday, April 29th, the Town of Saugeen Shores communicated that submitting these materials simultaneously would be problematic as the results and approval of the flood hazard assessment, for example, would impact the preparation of the site plan and engineering drawings. SVCA and the Town mutually agreed that the elements of the complete application would be submitted in two components: the flood hazard and dynamic beach assessments, followed by the remainder of the materials once the assessments had been approved by SVCA.

In general, SVCA staff are satisfied with the statistical analysis of the flood hazard assessment undertaken by the Applicant's consultant, and as such, I consider this requirement met. Therefore, the completion of the Flood Hazard Assessment is not in question. However, a Dynamic Beach Hazard Assessment has not been completed. SVCA's mapping shows that a portion of the proposed development is located within the dynamic beach hazard limit. Although some information has been submitted by the Applicant, it is my opinion that this does not constitute a study, or a plan to address this hazard, because the report submitted to SVCA did not provide scientific or engineering justification to substantiate eliminating or reducing the dynamic beach allowance, or an assurance that such is feasible.

Therefore, I recommend that an Administrative Review of the completeness of the CCV Permit Application be conducted by SVCA's Executive Committee on **Tuesday, September 7th, 2021, between 2:00 pm and 4:00 pm.** The focus of this Administrative Review is the absence of the Dynamic Beach Hazard Assessment and whether the information submitted by the Town to

date is satisfactory to deem the application complete. Since it was agreed by both the Town and SVCA that the adjacent flood and erosion impacts, floodproofing details, site plan/draft master plan and engineering drawings would be submitted following approval of the flood hazard and dynamic beach hazard assessments as the second components of the complete permit application, it is SVCA's understanding that these materials will be forthcoming for approval once the Administrative Review confirms the need for the Dynamic Beach Hazard Assessment or not.

As the agenda materials are required to be submitted one week in advance of an Executive Committee Meeting, I ask that you provide any presentation materials to me by 2:00 pm on Tuesday, August 31st.

If you have any questions about this correspondence or the scheduled Executive Committee meeting, please do not hesitate to contact me.

Best regards,

Jennifer Stephens

Jennifer Stephens
General Manager/ Secretary-Treasurer
Saugeen Valley Conservation Authority

Cc: Grant Diemert, Applicant's Agent (via email)
Peter Zuzek, Zuzek Inc. (via email)
Cheryl Grace, Director, SVCA (via email)
Mike Myatt, Director, SVCA (via email)
Maureen Couture, Chair, SVCA (via email)
Brandi Walter, Coordinator, Environment Planning, SVCA (via email)
Erik Downing, Manager, Environmental Planning and Regulations, SVCA (via email)

ATTACHMENT 6

Peter J. Zuzek, MES, CFM, P.Geo.
President

QUALIFICATIONS

PROFILE

Peter Zuzek is the founder and President of Zuzek Inc., a professional services company dedicated to increasing the health and resilience of the world's coastal ecosystems. He has 30 years of experience managing complex multi-disciplinary coastal investigations throughout North America and internationally. Services include coastal erosion and flooding, risk assessments, coastal zone planning, shoreline management plan development, water quality investigations, habitat protection and restoration, nature-based solutions, climate change studies, and community-based adaptation strategies.

EDUCATION

Master of Environmental Studies, University of Waterloo
Bachelor of Environmental Studies, University of Waterloo

ASSOCIATIONS

Professional Geoscientist, Association of Geoscientists of Ontario
Certified Floodplain Manager, Association of State Floodplain Managers
President, Coastal Zone Canada Association

EMPLOYMENT HISTORY

Zuzek Inc.: 2016 - present, President
Baird & Associates: 1994 - 2016, Project Manager

SHORELINE PLANNING AND MANAGEMENT

Increasing Coastal Resilience with Nature-based Solutions in the Great Lakes

Client: Environment and Climate Change Canada

Zuzek Inc. was retained by Environment and Climate Change Canada to prepare a White Paper outlining opportunities to integrate nature-based solutions in the Great Lakes to increase resilience. Recommendations included government alignment on integrated coastal management, co-development of solutions with communities, expanded protected areas, and funding to implement projects.

Town of Tecumseh Shoreline Management Plan

Client: Town of Tecumseh

Tecumseh is located on the south shore of Lake St. Clair and vulnerable to coastal and interior flooding. Pete led a combined coastal and interior flood risk assessment that considered historical events and climate change storms. Adaptation options to reduce risk was summarized in a Shoreline Management Plan.

Beach and Dune Management Plan for Burlington Beach

Client: Halton Region and the City of Burlington

Pete was the Project Manager responsible for the development of a long-term beach and dune restoration plan for Burlington Beach. The plan included beach nourishment, a dune grass nursery, and significant dune restoration with native species to increase the resilience of the beach to high lake levels and erosion.

Coastal Hazard Management in the Great Lakes – A Call to Action to Prepare for a Changing Climate

Financial Support: Natural Resources Canada

Pete prepared a White Paper on integrating Climate Change in hazard regulations in Ontario, which were developed on the assumption of climate stationarity. More than 20 Conservation Authorities were engaged to identify existing challenges and develop a path forward to integrate Climate Change in the future.

Chatham-Kent Lake Erie Shoreline Study

Client: Municipality of Chatham-Kent and the Lower Thames Valley Conservation Authority

Project Manager for Chatham-Kent Lake Erie coastal risk assessment. Technical studies and planning engaged a broad spectrum of stakeholders to evaluate hazards, map vulnerability, quantify risks, and develop community-scale climate change adaptation plans to increase resilience.

Town of Lakeshore Shoreline Management Plan Update

Client: Town of Lakeshore

Zuzek Inc. was retained to update the original Shoreline Management Plan prepared in 1976. Historical data on waves and lake levels, plus the latest projections for Climate Change influence on future lake levels and ice cover was integrated into the hazard mapping and regulatory setbacks.

Long Point and Walsingham Forest Priority Place Cloud Mapping Application

Client: Long Point World Biosphere Reserve Foundation

Zuzek Inc. was retained by the Long Point World Biosphere Reserve to develop a cloud-based mapping application to store and visualize geo-spatial data for the Priority Place.

Lower Trent Shoreline Management Plan Update

Client: Lower Trent Conservation Authority

Zuzek Inc. was retained by the Lower Trent Conservation Authority to complete a shoreline management plan update. The shoreline was sub-divided into reaches based on geomorphic conditions of the shoreline and updated flood and erosion hazard setback mapping was prepared.

Central Lake Ontario Shoreline Management Plan Update

Client: Central Lake Ontario Conservation Authority

Project Manager for an update of the 1990's shoreline management plan for CLOCA. The study included oblique aerial photographs, comprehensive field observations, numerical modelling, and updated hazard mapping.

Ganaraska Region Shoreline Management Plan Update

Client: Ganaraska Region Conservation Authority

The Ganaraska Region shoreline was the focus of a recent SMP update by Zuzek Inc. Detailed field observations and drone photography were collected, followed by updated extreme value analysis and numerical modelling. New mapping for the hazardous lands along Lake Ontario was generated.

Adapting to the Future Storm and Ice Regime in the Great Lakes

Financial Support: Natural Resources Canada

Project Manager for the first climate change investigation in the Great Lakes dedicated solely to evaluating the impacts of future coastal storm extremes and trends in ice cover on coastal communities and ecosystems. The data was mainstreamed into four adaptation case studies to increase community resilience.

Fortress of Louisbourg Sea Level Rise Adaptation Plan

Client: Parks Canada Agency

Project Manager for the Fortress of Louisbourg sea level rise adaptation plan. The site faces numerous natural hazards, including sea level rise, crustal subsidence, and exposure to severe storms from the North Atlantic. A series of mitigation plans were developed for the Grand Etang barrier beach and seawall.

Elgin County Shoreline Management Plan (SMP)

Client: Elgin County and Four CA's (Lower Thames, Kettle, Catfish and Long Point Region)

Project Manager for the Elgin County SMP update. Technical studies included a detailed field reconnaissance of 90 km of shoreline, measurement of historical shoreline erosion rates, and flood risk assessment for low lying lands. Various shoreline management options were developed based on the technical findings and policy guidance. A joint SMP was written for the four CAs.

Victoria Beach Integrated Shoreline Management Plan

Client: Rural Municipality of Victoria Beach

The coastal community of Victoria Beach is located on narrow peninsula in the southern basin of Lake Winnipeg. Pete managed a three-part study that culminated in the development of the Shoreline Management Plan to help the community address coastal hazards and maintain beach access. The technical work included a governance review, technical studies, and public engagement to develop the SMP.

Shoreline Restoration and Management Plan, Indiana Dunes National Lakeshore

Client: US National Parks Service

Contributed to a multi-disciplinary investigation to develop a shoreline restoration and management plan for the Indiana Dunes National Lakeshore. The coastal dune habitat features some of the most ecological diverse habitat in the Great Lakes Region and, yet is threatened by coastal development, park visitors, harbours that disrupt littoral drift, and invasive species.

Southeast Leamington Sustainable Management Strategy

Client: Essex Region Conservation Authority

Managed a complex multi-disciplinary investigation that included coastal process modelling, water quality studies, erosion and flooding assessments, dike geotechnical analysis, biodiversity assessments, and tourism economics. A benefit-cost analysis was used to evaluate alternative land use scenarios for the region, culminating in the selection of the preferred sustainable alternative.

Colchester to Southeast Shoal Littoral Cell Study

Client: Conservation Authority, Municipal Governments, and Industry

Led a comprehensive study on erosion and sedimentation processes for the littoral cell including Point Pelee National Park The investigation looked at historical sediment supply rates from erosion, sediment sinks, and depositional areas. The findings highlighted the negative impact of shoreline armouring on the park.

Regional Sediment Management Plan for Michigan City Harbor

Client: US Army Corps of Engineers, Detroit District

Managed a study on sediment bypassing at Michigan City. A long-term sediment budget was used to quantify sediment sources, transport pathways, and sinks along the coastline. The findings were used to develop a multi-agency regional sediment management plan to optimize sediment dredging and placement.

Ministry of Natural Resources Integrated Coastal Zone Management Review

Client: Ministry of Natural Resources and Forestry

In cooperation with Dr. Larry Hildebrand and Dr. Peter Ricketts, Pete managed a study for the Ministry of Natural Resources and Forestry on options to apply Integrated Coastal Zone Management principles in the Great Lakes Region. The report reviewed existing legislation, actions in other jurisdictions, and International case studies. Options for better integration and collaboration among government agencies and the steps required to achieve the stated goals were outlined.

Climate Change Impacts on Lake Ontario Coastal Processes

Client: Department of Fisheries and Oceans (DFO)

Retained to investigate the potential impacts of climate change on Lake Ontario coastal processes. Hourly wave conditions were predicted for the historical 1971 to 2000 over-water winds and the estimated future 2041 to 2070 over-water winds from the Canadian Regional Climate Model. In addition to evaluating the intensity and frequency of future storms versus historical conditions, the hourly waves from both scenarios were used in an erosion model to quantify recession rates and the availability of new sediment for beach building. The results were used to assess potential impacts to fish habitat by DFO.

Climate Change and Policy Workshop

Client: Ministry of Natural Resources and Forestry & Environment and Climate Change Canada

Coordinated a large coastal policy workshop on the status of existing regulations and the degree to which climate change was integrated. Recommendations were provided on required technical studies and the need for a White Paper on integrating climate change risk into the existing planning and regulatory framework.

Climate Change Risk Assessment for Coastal Infrastructure in Nova Scotia

Client: Nova Scotia Department of Transportation and Infrastructure Renewal

Pete managed a coastal risk assessment for several highway and bridge sites in Nova Scotia. Event based hazards such as storm surge, erosion, and flooding were investigated, along with long-term processes such as sea level rise and crustal subsidence. Management alternatives were developed to reduce risks.

EROSION AND SEDIMENTATION PROJECTS

Synopsis of Point Pelee National Park Erosion and Mitigation Options

Client: Parks Canada

Prepared a synopsis of shoreline erosion processes and rates within Point Pelee National Park. Updated mapping of recent erosion rates and forecasts of future shoreline position to assess infrastructure risks and potential habitat loss. A variety of mitigation strategies were highlighted, including beach nourishment.

Lac Seul Erosion Investigation

Client: Aboriginal Affairs and Northern Development Canada

Principal investigator for the Lac Seul erosion investigation. A comprehensive field program, literature review, and computer modelling were completed to generate multiple lines of evidence on the pre- and post-dam erosion rate on Lac Seul. Expert witness testimony provided in the Supreme Court of Canada.

Lake Winnipeg Water Level Regulation Review

Client: Manitoba Clean Environment Commission

Prepared an expert report on the impacts of Lake Winnipeg water level regulation on shoreline erosion and accretion processes. The critical factors controlling erosion were reviewed, along with the influence of fluctuating water levels (both natural and regulated). Presented the findings at a hearing in Winnipeg.

Ochiichagwe'Babigo'Ining Ojibway Nation Erosion Study

Client: Ochiichagwe'Babigo'Ining First Nation

Project Manager for two technical studies for the Ochiichagwe'Babigo'Ining Ojibway Nation. The first investigation focused on the linkages between water level regulation, flooding, and erosion associated with the Lake Woods water management regime. The second investigation developed conceptual design alternatives to protect critical infrastructure at risk to erosion and flooding.

Mitaanjigamiing First Nation Erosion Study

Client: Mitaanjigamiing First Nation

Project Manager for a two-part investigation for the Mitaanjigamiing First Nation on Rainy Lake. Part one included detailed site reconnaissance of the shoreline to identify potential erosion sites and critical infrastructure at risk to erosion and flooding hazards. Part two included the generation of design alternatives to protect critical infrastructure at risk to flooding for the upper portion of the easement and ensure the waterfront and boat launch were functional for the anticipated range of future lake levels.

Lac Des Mille Lacs Erosion Study

Client: Lac Des Mille Lacs First Nation

A multi-day field data collection mission was completed on Lac Des Mille Lacs. The information, along with desktop studies, were used to evaluate the impact of water level regulation on shoreline erosion within the Reserve. Recommendations were also provided for a flooding easement and critical infrastructure was identified that was vulnerable to flooding. Engineering designs were prepared to protect at risk buildings.

Whitesand First Nation Erosion Peer Review

Client: Ontario Power Generation

Retained by Ontario Power Generation to complete a peer review of documented erosion procession on the north shore of Lake Nipigon, within the limits of the Whitesand First Nation. The study included a review of the water level regulation on the lake and the influence on erosion processes. Detailed erosion measurements were completed to assess risks and make recommendations for erosion protection.

Lake St. Joseph Erosion and Flooding Assessment

Client: Attorney General of Canada and Ontario Power Generation

Served as an expert witness in the legal proceedings between the Mishkeegoggamang Ojibway First Nation and the Attorney General / Ontario Power Generation. A detailed field investigation was completed to collect erosion and sedimentation data. These data, along with historical references, shoreline change measurements, numerical modelling and expert judgement were used to formulate an opinion on the role of the lake flooding on erosion processes. Testimony was provided in the Ontario Provincial Court.

Gull Lake Wave Database

Client: Manitoba Hydro

Project Manager for a numerical modelling investigation on Gull Lake, in northern Manitoba. An hourly wave database was generated for the planned reservoir at full supply to support wave erosion modelling. The wave database was delivered in an interactive ArcReader GIS application.

Lake Diefenbaker Erosion Assessment

Client: Environment Canada

As Project Manager for the study, Pete was responsible for supervising the calculation of historical erosion rates, wave modelling, and shoreline erosion modelling with COSMOS. The COSMOS tool was used to investigate historical erosion rates and evaluate future water level management scenarios.

East Harbor State Park Erosion Investigation, Lake Erie

Client: Ohio Department of Natural Resources (DNR)

Retained by the Ohio DNR to evaluate erosion issues within the State Park and recommend remedial options to improve the swimming beach conditions. Technical studies included literature review, site surveys, aerial photograph analysis of historical shoreline change rates, sediment transport calculations, and a regional sediment budget. The preferred alternative included a series of low crested offshore breakwaters and beach nourishment.

Erie Shore Drive Flood and Erosion Study, Lake Erie

Client: Municipality of Chatham-Kent

Managed the investigation of coastal hazards for the community of Erie Shore Drive. The study included field work, modelling of coastal processes, erosion and flooding assessment, and the development of remedial options. A preferred option to protect the homes and dyke was developed.

Investigation into Downdrift Erosion Impacts, Shade Beaches, PA

Client: Harborcreek Township, Pennsylvania

Managed the investigation into potential downdrift impacts of a proposed harbor development on Lake Erie. The work included field reconnaissance, geology and erosion assessment, longshore sediment transport calculation, and a harbor bypassing analysis.

NIPSCO Bailly Station Intake Sand Transport Investigation, Indiana

Client: NIPSCO

Led the coastal investigation into sedimentation processes at the NIPSCO Bailly Station water intake. Numerical tools and GIS were used to quantify rates of sediment transport and accretion around the intake. The study recommended remedial measures to reduce sedimentation and dredging in the future.

Minnesota Point Section 111 Erosion Study Report

Client: US Army Corps of Engineers

Managed the investigation into erosion and sedimentation processes at Minnesota Point, Lake Superior, which features two jetted navigation channels and a long barrier beach system. Numerical modelling of waves and sediment transport in combination with shoreline change measurements, sedimentation records, and dredging history were used quantify erosion processes. Recommendations included relocating future dredged sediment to mitigate the ongoing shore erosion and nourish the beaches.

Toronto Islands Erosion Study

Client: Toronto and Region Conservation Authority

Led the coastal investigation into erosion processes at the Toronto Island. The technical studies included a review of historical aerial photographs, quantification of historical bathymetric changes, and numerical modelling of waves, currents and sediment transport to develop a detailed sediment budget. The sediment budget was used to quantify historical and modern sediment sources, transport pathways, and sinks. Long-term management recommendations were developed to reduce future shore erosion.

Keltic Lodge Coastal Erosion Study, Cape Breton, Nova Scotia

Client: Nova Scotia Department of Transportation and Infrastructure Renewal

Principal investigator in the study of coastal erosion hazards at the Keltic Lodge site, located on the narrow Middle Head Peninsula in Cape Breton. Erosion of the weak sea cliffs was threatening buildings and the transportation network. Remedial options were developed based on the geologic assessment, groundwater processes, wave climate, and sea level rise considerations.

FLOODING PROJECTS

Lake St. Martin Flood Relief Channel

Client: The KGS Group and Manitoba Infrastructure

Manitoba Infrastructure is designing a large flood relief channel from Lake Manitoba to Lake Winnipeg via Lake St. Martin. Zuzek Inc. was retained by the KGS Group to assess existing coastal conditions and potential post-project impacts. A geomorphic assessment of the riverine system was also completed.

Southeast Leamington Graduated Risk Floodplain Mapping Project

Client: Municipality of Leamington

Pete was the Project Manager for a comprehensive coastal flood risk assessment for Southeast Leamington, that included future projects for climate change impacts on lake levels, future erosion, and shoreline protection maintenance. Potential economic damages were calculated for three flood risk scenarios. Community scale adaptation plans were developed in consultation with the stakeholders.

FEMA Guidelines and Specifications for Coastal Floodplain Mapping

Client: Federal Emergency Management Agency (FEMA)

FEMA generates and updates graduated floodplain risk maps for all the rivers and coastal areas of the United States. Pete participated in a multi-team initiative to update the Guidelines and Specifications used to produce the mapping. The technical studies included the evaluation of the latest wave runup and overtopping procedures, wave and storm surge modelling capabilities, and overland wave propagation.

FEMA DFIRM Production for Kandiyohi and Eaton Counties

Client: FEMA Region V

Managed the technical studies and generation of digital flood insurance rate maps (DFIRMS) for two riverine counties in Michigan. More than 100 standardized tiles were generated to map the spatial extent of the 1% and 0.2% chance flood risks. The final products were delivered in a GIS Geodatabase.

FEMA DFIRM Production in Wayne and Monroe Counties

Client: FEMA Region II

Managed all activities related to the coastal analysis and generation of floodplain work maps for Wayne and Monroe Counties, Lake Ontario. The coastal analysis utilized the new response base approach to map the graduated risk zones for flooding hazards.

WATER QUALITY AND WATER QUANTITY PROJECTS

Great Lakes Integrated Nearshore Framework

Client: Environment and Climate Change Canada

Project Manager for a multi-year contract with Environment and Climate Change Canada to assist with the development of an Integrated Nearshore Framework and the Baseline Habitat Survey for the Great Lakes. The findings are being used to enhance protection of high-quality habitat and prioritize restoration activities.

Southern Georgian Bay Beta Habitat Units

Client: Environment and Climate Change Canada

The Baseline Survey approach developed for the Habitat and Species Annex of the Great Lakes Water Quality Agreement was applied by Pete for Southern Georgian Bay. The study relied on existing lakewide geo-spatial data and the generation of new information, such as detailed wave modelling. The findings were used to map Regional Habitat Areas and nested Habitat Units.

Barbados Water Quality Study, Coastal Risk Assessment and Management Program

Client: Coastal Zone Management Unit, Government of Barbados

Project Manager for a comprehensive water quality investigation. The study included a review of historical data, instrument deployment for new data collection, water chemistry assessment, and a detailed algae stable isotope analysis (over 500 samples) to determine the source(s) and fate of nitrogen pollution.

Lake Ontario – St. Lawrence River Water Level Regulation Study

Client: International Joint Commission, USACE, ECCC

Pete led a multi-year investigation on the impacts associated with water level regulation on Lake Ontario and the St. Lawrence River. Studies quantified the impacts on shore erosion, flooding, maintenance of existing shoreline protection structures, and supported the assessment of beach impacts. Economic damages were calculated with water levels for 3,000 km of shoreline and 20,000 individual property parcels.

International Upper Great Lakes Study

Client: ECCC, USACE, and the IJC

Managed several investigations for the Upper Great Lakes Study, including a review of available geo-spatial data and the investigation of flooding impacts associated with alternative regulation plans for historical supplies and climate change induced water supplies.

Rainy Lake Excel Flood Tool

Client: International Joint Commission

Managed the development of a custom Excel based open-source flooding tool to evaluate alternative water level regulation scenarios for the Rainy Lake system and the associated impacts on riparian property. The tool utilized time series water levels and historical storms to estimate flooding damages to existing buildings and calculate economic damages.

Preliminary Study of Structural Compensation Options for the St. Clair River

Client: International Joint Commission

Project Manager for a study into engineering options to remediate past dredging of the St. Clair River, which has increased the conveyance of the river. Conventional flow remediation structures, such as sills and weirs were considered, along with options that would enable adaptive management of flow regulation, such as gated structures and submerged hydroelectric turbines.

ECOSYSTEM ASSESSMENTS AND RESTORATION PROJECTS

Management Recommendations for the Long-term Conservation of Barrier Protected Great Lakes Coastal Wetlands

Client: Environment and Climate Change Canada

Pete assembled information on the physical processes impacting the supply of sand to barrier protected coastal wetlands and identified existing management challenges due to natural, anthropogenic, and climate related stressors. Adaptive measures for the conservation of coastal wetlands were developed.

St. Clair National Wildlife Area

Client: Canadian Wildlife Service

Project Manager for the development of an impounded wetland management plan for the St. Clair and Bear Creek Units. The plan included recommendations for short-term dike maintenance, wetland habitat inventories, and long-term strategies such as restoring natural hydrologic conditions at select locations.

Rondeau Barrier Beach Restoration, Erieau, Ontario

Client: Ministry of the Environment, Conservation, and Parks

Pete was the Chair of the Advisory Committee for the restoration of the Rondeau Barrier Beach and navigation channel. Nature-based solutions were implemented to rebuild the barrier beach, protect wetland habitat in the embayment, stabilize the navigation channel, and create habitat for endangered species.

Great Lakes Wetland Migration and Sediment Dynamics

Client: Environment and Climate Change Canada

Zuzek Inc. developed a new methodology to evaluate upslope and downslope wetland migration potential in the Great Lakes in response to future climate change lake level extremes. The results were summarized in upslope and downslope migration indices and integrated into a larger coastal wetland risk assessment.

Ecosystem Based Adaptation Pilot Study for Reef Restoration

Client: Coastal Zone Management Unit, Government of Barbados

Managed a pilot project to restore the fringing reefs of Barbados. These shallow ecosystems protect the island beaches from storm damage and produce the carbonate sediment needed to maintain healthy beaches but have declined in response to climatic stressors and pollution. The study assessed reef health, identified coral donor colonies, and constructed an aquaculture laboratory to grow small coral in a controlled environment. Once the corals reached a sufficient size, they were transplanted to the reefs and monitored.

Keta Lagoon Causeway and Sea Defense, Ghana, West Africa

Client: Government of Ghana

Led the coastal process investigation to support the design of sea defences along a 7 km eroding barrier beach in Ghana. The long-term erosion rate ranged from 5 to 10 m/yr. Technical analysis included historical shoreline change measurements, review of geologic conditions, and littoral sediment budget calculations. The findings were used to support the remedial design, which included 10 million cubic metres of beach nourishment, a new coastal highway, land reclamation and habitat restoration.

INTERNATIONAL PROJECTS

Regional Programme for the Sustainable Management of Coastal Erosion and Sea Level Rise in the Seas of East Asia

Client: United Nations Environmental Programme

Retained by the UNEP to develop a strategic policy document on coastal erosion and sea level rise for the Coordinating Body of the Seas of East Asia (COBSEA). Phase 1 focused on country consultations and the framework development. In Phase 2, a one-week workshop was held in Thailand with the 10 member countries to refine the approach and finalize the document which was published by the UN.

Barbados Shoreline Change Study, Coastal Risk and Management Program

Client: Coastal Zone Management Unit, Government of Barbados

Project Manager for a shoreline change study for the island of Barbados. The investigation included the review and analysis of four decades of beach profile data to assess erosion and accretion patterns. Recommendations were provided to enhance the program with new data collection tools. Shoreline change was also analyzed with historical aerial photographs dating back to the 1950s. Detailed rates of change were calculated for the beach and cliff environments. The results were used to develop a coastal classification that characterizes the long-term shoreline trend for natural and engineering shorelines.

Development of a Hurricane Erosion Vulnerability System, Elbow Cay, Bahamas
Client: Government of The Bahamas

Lead coastal scientist for the assessment of hurricane erosion vulnerability at Elbow Cay, which was extensively damaged by Hurricane Floyd in the Fall of 1999. A custom system was developed that integrated GIS technology and numerical models to assess potential storm damage and resilience of the islands beaches to future hurricanes. The erosion prediction tools were also used to evaluate the feasibility of several remedial alternatives to strengthen the protection provided by the beaches of Elbow Cay.

Evaluation of Hurricane Impacts for a Deep-Water Outfall
Client: Government of Dominica

Investigated hurricane storm damages at the location of a proposed deep-water outfall on the Island of Dominica. The geologic properties of the site were evaluated, along with modelling estimates of beach and seabed erosion for future hurricanes. The modelling results were also used to develop the engineering aspects for the outfall, including the anchoring system and burial depth.

Simandou Port Construction Feasibility Study, Guinea
Client: Rio Tinto

Led the field investigations into the feasibility of a new port construction in a large tidal estuary in southern Guinea. The field work included instrument deployment, sediment coring and characterization within the estuary and on the delta, and a geomorphic assessment of the river shoreline and coast. The findings were used to assess navigation channel location and dredging requirements for the proposed port.

Analysis of Beach Erosion and Channel Sedimentation, Herzliya Marina
Client: Government of Herzliya

Lead coastal investigator for a beach erosion and sedimentation study at the Herzliya Marina, north of Tel Aviv. Aerial photograph comparisons, seabed change measurements, and numerical modelling were used to quantify sediment sources, rates of sediment transport, and channel sedimentation. Remedial options were developed to reduce future maintenance costs and maintain safe navigation into the marina basin.

TECHNICAL PAPERS AND CONFERENCE PRESENTATIONS

Zuzek, P.J. (2020). Lessons Learned from the Chatham-Kent Lake Erie Vulnerability Assessment and Climate Change Adaptation Study. Presented to the Department of Foreign Affairs, Chicago, Illinois.

Zuzek, P.J. (2020). Climate Change Impacts on Great Lakes Bluff Erosion. Presented to the Huron County Water Commission.

Zuzek, P.J. (2020). Shoreline Erosion and Community Scale Adaptation Strategies. Presented at the Lake Huron Nearshore Workshop.

Zuzek, P.J. (2019). Flood and Erosion Vulnerability Studies in Southwestern Ontario. Southwestern Ontario Shoreline Roundtable Information Meeting, London, Ontario.

Zuzek, P.J. (2019). Chatham-Kent Lake Erie Shoreline Study and Planning Implications. 2019 Ontario West Planners Forum, London, Ontario.

Zuzek, P.J. (2019). Climate Change Impacts on Coastal Storms and Ice Cover for Lakes Erie and Ontario. Provincial Flood Forecasting and Warning Workshop, Toronto, Ontario.

Zuzek, P.J. (2018). Collaborative Shoreline Management Planning and Climate Change Adaptation Planning on Lake Erie. Latornell Conservation Symposium, Alliston, Ontario.

Zuzek, P.J. and Mortsch, L. (2018). Adapting to the Future Storm and Ice Regime in the Great Lakes. Coastal Zone Canada Association Conference, St. John's, Newfoundland.

Zuzek, P.J., Anderson, J., McKenna, J., and Hatcher, J. (2018). Application of the Nearshore Framework Assessment for Lake Erie and the Huron-Erie Corridor in Canada. International Association of Great Lakes Research Conference, Toronto, Ontario.

Zuzek, P.J. (2017). Overview of Coastal Hazard Management in the Great Lakes. Eight Annual National Roundtable on Disaster Risk Reduction, Halifax, Nova Scotia.

Zuzek, P.J. (2016). Elgin County Shoreline Management Plan. Proceedings of the 2016 Coastal Zone Canada Conference, Toronto, Ontario.

Degia, K. and Zuzek, P.J. (2016). Coral Reef Restoration as a Climate Change Adaptation Approach. Proceedings of the 2016 Coastal Zone Canada Conference, Toronto, Ontario.

Zuzek, P.J. (2015). Development of a Joint Shoreline Management Plan for Elgin County. Proceedings of the 2015 Latornell Conservation Symposium, Alliston, Ontario.

Zuzek, P.J. (2014). Development of an Integrated Nearshore Framework for the Great Lakes. Proceedings of the Coastal Zone Canada 2014 Conference, Halifax, Nova Scotia.

Zuzek, P.J. (2013). Stakeholder Engagement and Initial Development of the Great Lakes Nearshore Framework. Proceedings of the Latornell Conservation Symposium, Alliston, Ontario.

Zuzek, P.J. (2012). Developing a Long-term Shoreline Management Plan for Victoria Beach Using a Stakeholder Centric Framework. Coastal Zone Canada Conference 2012, Rimouski, Quebec.

Zuzek, P.J. (2011). The Integration Imperative for Sustainable Coastal Management. Proceedings of the Latornell Conservation Symposium, Alliston, Ontario.

Zuzek, P.J. (2011). Pilot Studies to Evaluate the Draft 2009 Guidelines and Specifications for Coastal Floodplain Mapping in the Great Lakes Basin (Event vs. Response Methods). Association of State Floodplain Managers, Louisville, Kentucky.

Zuzek, P.J., Craig, B., Dobbie, T., and McKay, V. (2010). Application of Ecosystem Based Management Principles to the Design of Erosion Mitigation Alternatives for PPNP. Proceedings of the Latornell Conservation Symposium, Alliston, Ontario.

Zuzek, P.J. (2010). Nova Scotia Coastal Infrastructure Risk Assessment: Applying Sound Planning and Engineering to Reduce Risk and Lower Maintenance Costs Along Coastal Highways in Nova Scotia. Proceedings of the 2010 Coastal Zone Canada Associate Conference, Charlottetown, PEI.

Zuzek, P.J. (2009). Great Lakes Climate Change and Policy Workshop for the Coastal Zone. Proceedings of the Latornell Conservation Symposium, Alliston, Ontario.

Zuzek, P.J., Schmidt, K., Henderson, J., and Craig, B. (2008). Sustainable Management Strategy for Southeast Leamington, Ontario, Canada. Proceedings of the 2008 Coastal Zone Canada Association Conference.

Nairn, R.B., Zuzek, P.J., Charles, M., and Moir, C. (2008). Restoration of Lighthouse Beach Sand Spit, Pictou Landing, Nova Scotia. Proceedings of the 2008 Coastal Zone Canada Association Conference.

Nairn, R.B., Zuzek, P.J., and Woodrow, D. (2007). Evolution and Future of the Eastern Lake Ontario Dunes and Barrier Beaches. Proceedings of the International Associations of Great Lakes Research Conference 2007.

Zuzek, P.J. (2007). Will There Be Beaches on Lake Ontario for the 100th IAGLR Conference? Proceedings of the International Associations of Great Lakes Research Conference 2007.

Zuzek, P.J., Schmidt, K., and Craig, B. (2007). Developing a Sustainable Management Strategy for Southeast Leamington: A Multi-Agency and Stakeholder Collaboration Across Boundaries. Proceedings of the 6th International Science and Management of Protected Areas Association (SAMPAA) Conference. May 21-26, 2007, Wolfville, NS.

Nairn, R.B. and Zuzek, P.J. (2006). Automated Lake-wide Calculations of Coastal Erosion and Economic Damages for Lake Ontario. Proceedings of the 59th CWRA Annual Conference. June 4-7, Toronto, Ontario.

Zuzek, P.J. Bender, T. and Moulton, R. (2005). Development of a Comprehensive GIS Parcel Database for the Coastal Hazard Zone of Lake Ontario. Proceedings of the Coastal Geotools Conference, 2005, Myrtle Beach, S.C.

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ATTACHMENT 7


The Role of Sand Dunes
Do your part.
Stay 2 meters apart.

ATTACHMENT 8

February 25, 2021

Zuzek Inc.
125 Wimberly Avenue
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Ph: 905-719-8980

Via email: b.walter@svca.on.ca

Ms. Brandi Walter
Environmental Planning Coordinator
Saugeen Valley Conservation Authority
1078 Bruce Rd. 12, Box 150
Formosa, ON N0G 1W0

Dear Ms. Walter,

Re: Review of Shoreplan Report for the Proposed Cedar Crescent Village Development (dated October 28, 2020)

This letter report was prepared by Zuzek Inc. and SJL Engineering Inc. to summarize our peer review of the Shoreplan Engineering Limited (Shoreplan) letter report for the Port Elgin Beach Hazard Assessment (Shoreplan file No. 20-3366), which pertains to the proposed Cedar Crescent Village development. This review was completed under contract to the Saugeen Valley Conservation Authority (SVCA). The scope of our review is based on the e-mail from SVCA to Shoreplan outlined below. All site elevations and Lake Huron water levels are referenced to the CGVD28 datum (also referred to as GSC), consistent with the Shoreplan report.

SVCA E-mail to B. Pinchin (September 10, 2020)

The SVCA e-mail dated September 10, 2020 to B. Pinchin requested the following technical analysis:

- An assessment of the Flood Hazard Limit at the site and a short distance north and south.
- An assessment of the inland limit of the dynamic beach.
- If the proposed development was located within the Flood Hazard Limit, what would be the impacts to flood elevations on adjacent lands and would the proposed development be subject to hazards related to ice pilling and wave impacts.

Documents Reviewed

In addition to the Shoreplan report, the following documents and background information were reviewed to complete the peer review:

- Plan view drawings and 3D renderings of the proposed Cedar Crescent Village prepared by G.M. Diemert Architect Inc. (dated October 29 and 30, 2020).
- MNR 1989 Great Lakes System Flood Levels and Water Related Hazards.

- Federal water level gauge data for Lake Huron (Tobermory, Port Elgin, Goderich) at: https://waterlevels.gc.ca/eng/find/region/6.
- Seglenieks, F. and Temgoua, A. (2021). Future hydroclimate variables and lake levels for the Great Lakes using data from the Coupled Model Intercomparison Project Phase 5 (draft). Environment and Climate Change Canada.

Flood Hazard Assessment

A 100-year flood level or peak instantaneous water level of 177.6 m CGVD28 was identified by Shoreplan, which is consistent with the material published originally in the 1989 MNR study. The Forward statement of that report indicates the water level information was based on a 1988 study, meaning data from 1989 onward was not analyzed. Consequently, there has been 32 years of recorded water levels on Lake Huron that were not analyzed by Shoreplan for the assessment. Updated extreme value analysis is required on recorded monthly mean lake levels and storm surges, along with a joint probability analysis using all measured data.

In 2020, Lake Huron established new individual monthly record water levels for eight consecutive months from January to August and came close to the all-time monthly high established in October of 1987. Further, the maximum daily water level in 2020 at the Goderich gauge was 177.5 m CGVD28, which is only 10 cm lower than the 100-year flood level reported in MNR (1989).

When recent record setting water levels were included in the analysis of updated lake levels for other Zuzek Inc. studies around the Great Lakes, such as the Lake Ontario Shoreline Management Plan (Zuzek Inc., 2020), significant changes were identified from the historical levels published in MNR (1989). For example, following the record high water levels on Lake Ontario in 2019, the updated 100-year flood level for the Toronto water level gauge increased from 75.74 m IGLD'85 to 76.01 m IGLD'85, for an increase of 0.26 m. The Cobourg water level gauge increased from 75.80 m IGLD'85 to 76.01 m IGLD'85, for an increase of 0.21 m.

In a recent report from Environment and Climate Change Canada (Seglenieks and Temgoua, 2021), projections of future lake levels were summarized for global temperature increases of 1.5 to 3.0 degrees Celsius. Data on precipitation, evaporation, and runoff for the analysis was extracted from 13 pairs of Global and Regional Climate Models from the Coupled Model Intercomparison Project Phase 5 (CMIP5). The historical variability in measured lake levels is projected to continue (i.e., periods of highs and lows). However, due to increases in precipitation with a warming climate, both mean lake levels and extreme highs are projected to increase in the future. Refer to Figure 1 from Seglenieks and Temgoua (2021). For some of the modelled scenarios, water levels are 0.5 m to over 1.0 m higher than the measured historical data on Lake Huron.

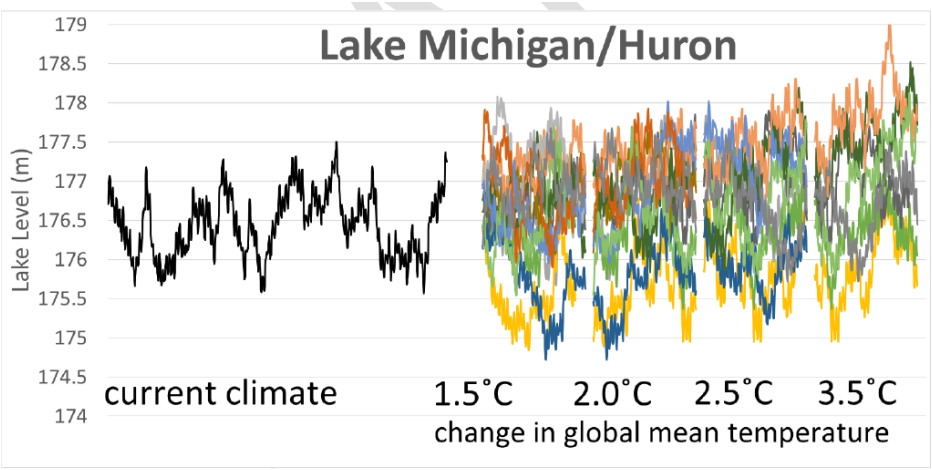


Figure 1 Projected Future Lake Levels for Different Global Warming Trends and GCM-RCM Simulations (from Seglenieks and Temgoua, 2021)

The ECCC results on future lake levels are also summarized as probability of exceedance for the future scenarios, relative to the historical baseline condition from 1961 to 2000. The results for the 1% and 50% exceedance for increases in global mean temperatures from 1.5 and 3.0 degrees Celsius are summarized in Table 1. These data indicate that as temperatures in the Great Lakes Basin continue to increase in the future, mean lake levels will increase slowly over time (refer to the 50% exceedance results in Table 1). More importantly for this Port Elgin assessment, there is an increase in the projected extreme lake levels of more than 0.4 m for the 1.5 and 2.0 degree Celsius warming estimates (refer to 1% exceedance levels in Table 1, which is similar statistically to a 1% probability lake level or the 100-year flood level).

Table 1 Projected Change in Future Lake Level Extremes (from Seglenieks and Temgoua, 2021)

Percent Exceedance	Projected Increase in Lake Level from Historical Baseline			
	1.5 C of Warming	2.0 C of Warming	2.5 C of Warming	3.0 C of Warming
1%	0.42 m	0.48 m	0.66 m	1.36 m
50%	0.08 m	0.07 m	0.14 m	0.24 m

The recent 2018 report from the Intergovernmental Panel on Climate Change (IPCC) puts these projected increases in global warming in context by presenting a timeline of historical CO_2 emission and future scenarios. There is high confidence that global mean temperatures will surpass 1.5 degrees Celsius between 2030 and 2052 if CO_2 emissions continue to increase at the current rate (refer to Figure 2). In a 2021 publication by Hébert et al., it was stated that warming of 1.5 degrees Celsius by 2038 was extremely likely (>95%).

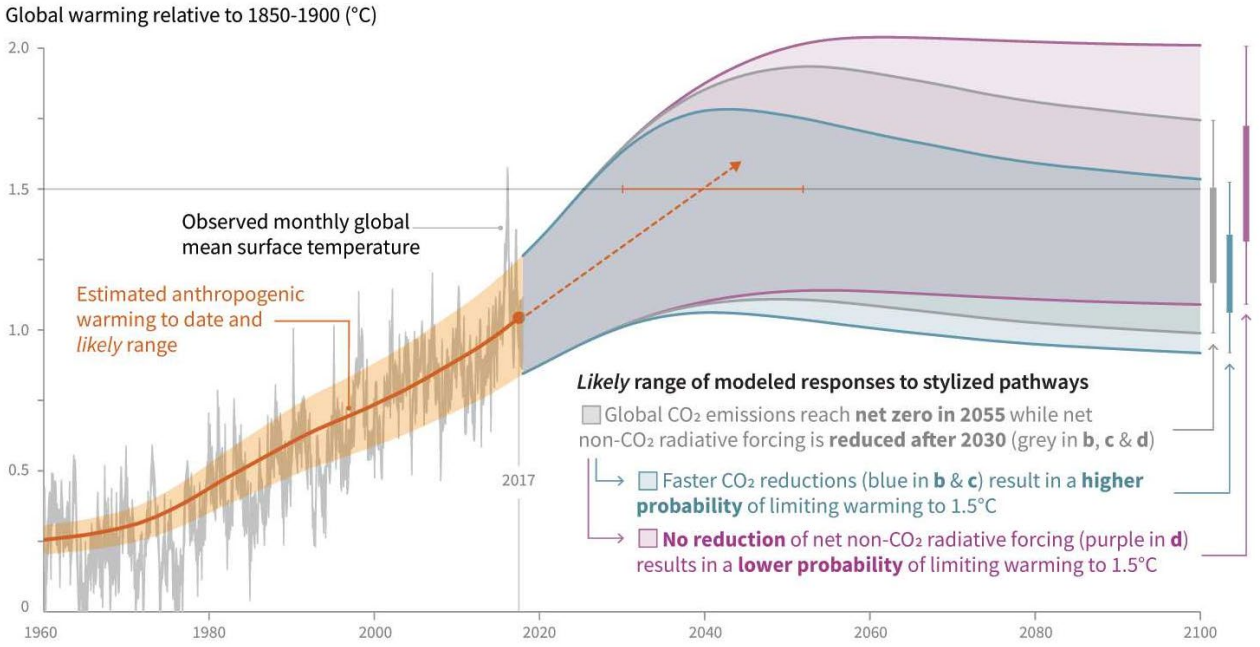


Figure 2 Observed Global Temperature Change and Projected Increases for Different CO_2 Emission Scenarios (IPCC, 2018)

In Canada's Changing Climate report by Bush and Lemmen (2019), Chapter 4 on temperature and precipitation states that it is virtually certain Canada's climate will continue to warm in the future, with the projected increase in mean temperature in Canada being about twice the global estimate (Zhang, X. et al, 2019). The results presented specifically for Ontario, project an increase in annual mean surface air temperature from 1.5 to 2.3 degrees Celsius by 2030-2050 (Zhang, X. et al, 2019) relative to 1986 to 2005.

The Provincial Policy Statement (PPS, 2020) provides direction on matters related to land use planning and development. Section 3.0 deals specifically with protecting public health and safety, including mitigating risks that may be associated with the impacts of a changing climate. In Section 3.1.3 planning authorities are directed to prepare for the impacts of a changing climate that may increase the risk associated with natural hazards. The Shoreplan report does not address potential impacts of climate change, including higher projected lake levels which would increase the 100-year flood level for planning and regulatory decisions.

The suggested location of the 100-year flood level was noted on Figure 1 of the Shoreplan report, which includes the UAV collected aerial photograph as a background image. The position of this contour appears to be biased by the presence of the temporary construction road and rip rap placed to repair the marina breakwater. As seen in Photo 3 of the Shoreplan report, this area now features a sloping beach. Therefore, it does not appear this topographic data properly characterizes the current conditions of the beach to map the location of the 100-year flood level in MNR (1989) or an updated 100-year flood level based on the additional measured water level data from 1989 to 2020.

We have not reviewed the SWOOP elevation data, Hewett and Milne Limited survey, or the new site-specific UAV elevation data collected locally for Shoreplan. However, we have seen similar inconsistencies with the SWOOP elevation data in other locations. The elevation data collected for the parking lot area is considered sufficient for this analysis. However, the data for the beach south-west of the boardwalk is not representative of the current site conditions and therefore may not be suitable for the runup calculations.

Although the specific WIS station used in the assessment of extreme offshore waves was not provided in the Shoreplan report, it is possible that station ID93227 was used, which is located in 43 m water depth approximately 7 km offshore (NW) from Port Elgin. Our review of the offshore wave data from this station shows similar results to those presented by Shoreplan. The SWAN modelling completed by Shoreplan to transform the offshore waves to the shoreline appears reasonable, and SWAN is an appropriate model to be used for this purpose.

Although the wave runup approach and methodology presented by Shoreplan is appropriate, the topographic data at the shoreline which it is based may not be appropriate, as discussed above. Moreover, the wave runup results presented in the Shoreplan report appear to be inconsistent. It is stated that the governing wave runup elevation is "178.65 m, which is only 25 cm above the 100-year flood level". However, the established 100-year flood level was previously reported to be 177.6 m, suggesting the wave runup elevation is actually 1.05 m above the 100-year flood level. This would be a more realistic result based on our experience for similar conditions and shoreline geometries.

The flood hazard including wave runup is later identified in the report as the 177.85 m contour for the higher elevation landscaped area and this lower elevation is recommended as the flood hazard limit.

Finally, the sample wave runup calculation presented in Figure 5 of the report indicates a value of 1.23 m or an elevation of +178.83 at Profile 6, which is higher than either of the conflicting results presented in the body of the report (although it is unclear for what input conditions these results were obtained). The establishment of the appropriate wave runup elevation is not well documented. Based on our experience, for a narrow, gently sloping sandy beach with 20-year offshore wave heights exceeding 7 m, a wave uprush height of only 25 cm would appear to under-estimate wave runup potential.

A line for the flood hazard limit is plotted on Figure 1 of the Shoreplan report. The elevation of the line is not noted on the figure but based on its location between the 177.5 m and 178.0 m contours, it would appear to be the lower of 100-year flood levels noted above (177.85 m not 178.65 m). Based on the contours in Figure 1, if 178.65 m was mapped as the flood hazard level, it would be located further inland near the eastern limit of the site, close to Harbour Street.

In the section on Development Implications and Floodproofing, the question of the appropriate allowance for wave uprush at the site is further complicated by the discussion on page 6 and 7. With the higher stated flood level of 177.73 m, a wave uprush of 0.5 to 0.6 m is suggested, which is between the values stated earlier of 0.25 m and 1.05 m. It is not clear whether the wave runup methodology was applied with the higher flood level of 177.73 m for the floodproofing assessment

or the uprush level of 0.5 to 0.6 m was estimated. Further, it is not clear what an appropriate wave uprush value is for the southern half of the site adjacent to the beach.

Wave overtopping was assessed by Shoreplan for the east marina wall, and the wall fronting the existing marina buildings. Mean overtopping rates during the 100-year water level and 20-year storm condition were estimated to be 5 l/s/m and 10 l/s/m respectively. Although the methodologies used were not outlined, the results appear reasonable based on the wave heights and freeboards established at these locations.

The implications of these overtopping rates are not particularly well documented by Shoreplan. Available literature suggests that although overtopping rates of 5 to 10 l/s/m are not likely to damage the backshore provided it is paved, they are high enough to be dangerous to pedestrians and vehicles and may result in structural damage to buildings that are located in close proximity to the shoreline or marina walls (CIRIA, 1991 and reproduced by MNR, 2001).

The impacts that wave overtopping may have on flooding are not only related to the rate of overtopping of the marina walls, but also to the topography in lee of the marina walls. If the topography of the site provides a flow path for the overtopped water, contributions to site flooding could occur. These potential flow paths appear to be accounted for in the flood mapping presented in the Shoreplan report, as the existing marina buildings and low-lying areas behind them are all within the established flood hazard.

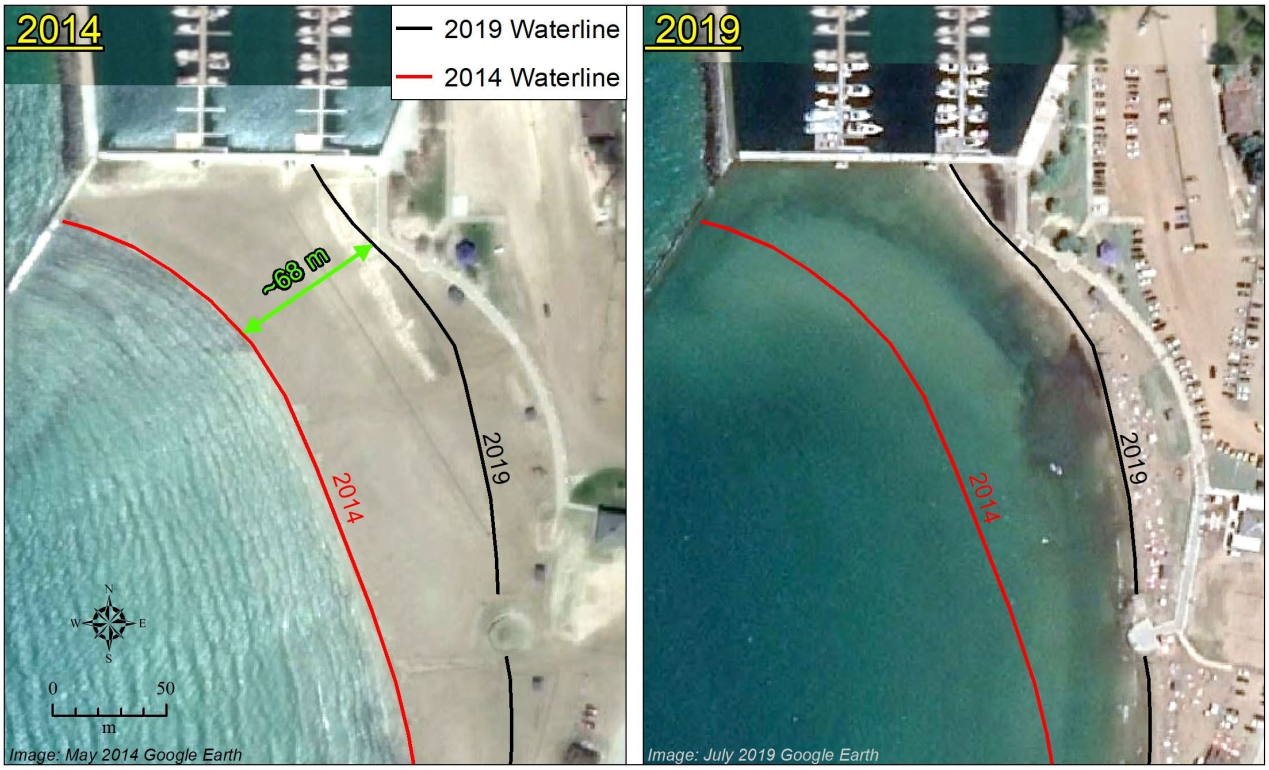
Dynamic Beach Assessment

The MNR (2001) Technical Guide defines the Dynamic Beach Hazard as the landward extent of the Flood Hazard Limit plus a 30 m dynamic beach allowance. A provision is included in the Technical Guide to define the dynamic beach allowance based on a study using accepted scientific and engineering principles.

The MNR (2001) Technical Guide also provides the following guidance to implementing agencies in Section 5.1 paragraph 4.0:

> Due to the highly dynamic and highly valued naturally occurring protective benefits realized by maintaining the physical integrity of these dynamic beaches, implementing agencies must ensure that policies established to address these areas recognize these benefits and maintain these dynamic beaches in their natural state.

Shoreplan state that the paving stone walkway represents the practical limit to the dynamic beach at the site, yet it does not appear this statement is supported with any studies using scientific or engineering principles. For example, no information on historical changes in the beach position, recent trends, or the impacts of constructing the paving stone walkway on the beach were presented. In short, the dynamic nature of this beach has not been studied to substantiate a reduction in the standard 30 m dynamic beach allowance. In the map below, the location of the waterline in 2014 and 2019 is compared. The waterline has migrated inland approximately 75 m, suggesting significant cross-shore profile adjustment has occurred during the recent period of rising lake levels.



Climate change will introduce new challenges for the beach at Port Elgin. The waterline has already migrated ~68 m inland during the current period of rising lake levels and in the future the lake may reach even higher levels as documented earlier in this review. Projected increases in air and lake temperatures will also expose the shoreline to more winter storm events in the future.

For example, lake surface temperatures have been increasing across the Great Lakes for several decades, including Lake Huron (Irambona et al, 2017). Consequently, mean annual ice cover across the Great Lakes has been decreasing since 1975 (Wang et al, 2012). With the projected future warming for Canada's climate (Zhang, X. et al, 2019), these trends will continue. Using 1986 to 2005 as a baseline, projected increases in lake surface temperature for Lake Huron for mid-century (2040-2059) and late-century (2080-2099) were recently evaluated with data from the Canadian Regional Climate Model Version 5 (CRCM5) with boundary conditions provided by four Global Climate Models, including CanESM2, NCRM-CM5, MPI-ESM-LR and GFDL-ESM2M (Seglenieks and Temgoua, 2021). The results for the CRCM5/CanESM2 simulation are presented in Figure 3, which show lake surface temperature warming ranging from 0.5 to 3.0 degrees Celsius for the mid- and late century estimates for the RCP4.5 and RCP8.5 emission scenarios.

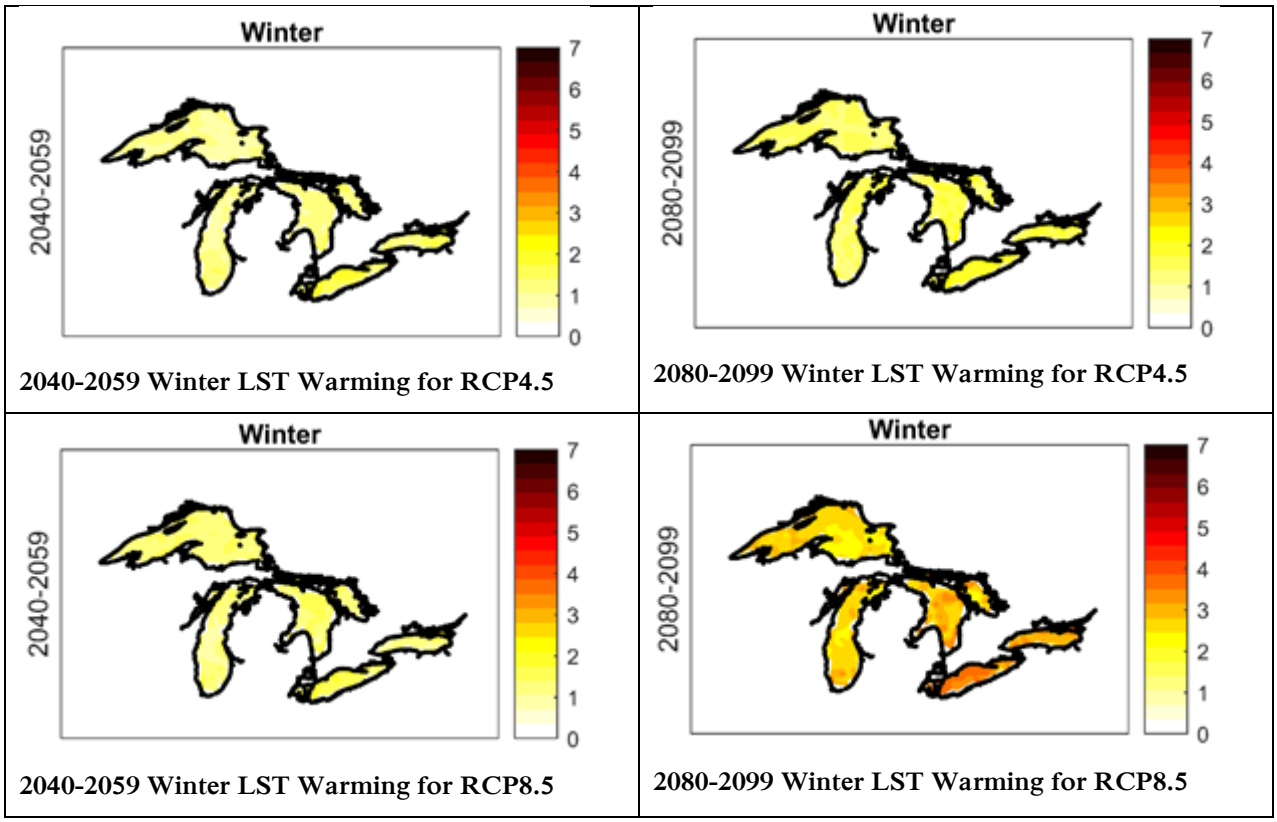


Figure 3 Mid- and Late-Century Lake Surface Temperature Warming for RCP4.5 (top) and RCP8.5 (bottom) Simulations from CRCM5/CanESM2 Relative to 1986-2005 (Seglenieks and Temgoua, 2021)

This amount of warming resulted in significant loss of ice cover in the future CRCM5 simulations, with estimates for Lake Huron ranging from 36% to 67% for mid-century to 58% to 92% by late-century. These reductions in lake ice cover will expose the Port Elgin beach to more erosive winter storms. While a quantitative estimate of the change in exposure for the Port Elgin shoreline to coastal storms is not available with reduced ice cover, a recent analysis on Lake Erie showed that the loss of future ice cover would increase the exposure of the north shore to 70 to 120% more winter wave energy (Zuzek Inc., 2019).

Development Implications

Shoreplan conclude the development can proceed safely within the flood hazard limit if suitable floodproofing measures are applied. However, their analysis does not consider the last 32 years of measured water levels, nor does it consider the latest research on the impacts of climate change. Moreover, the location of the 100-year lake level on the proposed development site is unknown since their survey of the beach was completed when a temporary construction access road was in place along the waterline.

With respect to Ontario Regulation 169/06, the control of flooding and potential for the proposed development to negatively impact flooding on adjacent properties has not been adequately addressed. For example, the current 100-year flood level has not been established with measured

water level data and the location of the 100-year flood level contour cannot be established adjacent to the proposed development due to limitations with the topographic data. There is also uncertainty on what the appropriate wave uprush value is for the Flood Hazard Limit (three different values were provided in the report). With respect to the Dynamic Beach Hazard Limit, there has been no scientific or engineering study to justify eliminating the 30 m dynamic beach allowance.

If the site is floodproofed as recommended by Shoreplan to an elevation of 177.9 m, the water that currently floods the parking lot during storms may exacerbate the flood risk to adjacent properties to the north and south due to flood diversion and a substantial loss of flood storage capacity. It does not appear this threat associated with floodproofing the proposed development has been investigated.

Summary

The following points summarize our findings of the peer review:

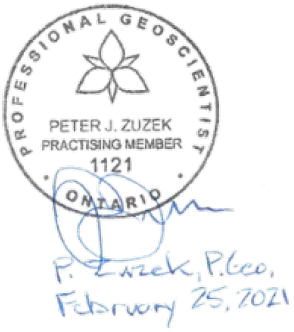
- The analysis failed to consider the last 32 years of measured water levels on Lake Huron and thus has not established a current 100-year flood level at the site.
- The latest research on the impacts of climate change on future lake levels was not considered. The best available research indicates rising mean lake levels as our climate warms and higher extreme levels (up to 0.4 m higher with warming of 1.5 degrees Celsius).
- Although offshore wave data and methodologies employed in the determination of wave uprush are appropriate, the topographic data used to establish beach transects for runup calculations may not be an accurate representation of current topography due to the presence of a temporary construction road when the topographic data was collected.
- The conclusions pertaining to wave runup elevations are inconsistent and unclear. Three different runup elevations are presented in different instances throughout the report (0.25 m, 0.5/0.6 m, and 1.05 m). The runup height adopted for flood mapping (0.25 m) appears low based on the shoreline geometry and offshore wave data.
- The location of the 100-year flood level is unknown due to the presence of a temporary construction road when the survey data was collected for Shoreplan.
- No study using accepted scientific or engineering principles was presented to substantiate eliminating the 30 m dynamic beach allowance.
- Building in the coastal floodplain and floodproofing the proposed buildings is not consistent with the PPS (2020), which states planning authorities shall prepare for the impacts of a changing climate that may increase the risk associated with natural hazards. The technical material presented in this review demonstrate that the risks associated with natural hazards at the Port Elgin site will increase in the future.
- The control of flooding and potential for the proposed development to negatively impact flooding on adjacent properties has not been well addressed. We expect the proposed flood proofing measures associated with the new development to have a measurable impact on neighbouring properties to the south.

Please contact me if you have any questions about this review or any further requirements.

February 25, 2021

Yours Truly,
Zuzek Inc.

Peter J. Zuzek, MES, CFM, P.Geo.
President



e-cc: Seth Logan, P.Eng., SJL Engineering Inc.

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ATTACHMENT 7

July 22, 2021

Zuzek Inc.
125 Wimberly Avenue
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Via email: b.walter@svca.on.ca

Ms. Brandi Walter
Environmental Planning Coordinator
Saugeen Valley Conservation Authority
1078 Bruce Rd. 12, Box 150
Formosa, ON N0G 1W0

Dear Ms. Walter,

Re: Review of Saugeen Shores Letter on Cedar Crescent Village dated June 4, 2021

We have reviewed the letter from Saugeen Shores dated June 4, 2021 and offer the following comments:

- **1. Flood Hazard Assessment**: Saugeen Shores have incorrectly characterized the need for the additional technical analysis. They were asked to update the statistical analysis of measured lake levels because the proposed development will encroach onto the existing Flood Hazard Limit from the Conservation Authority. In the future, if a proponent proposes a new development and it is located outside (upland) of the Flood Hazard Limit, there would be no requirement to complete an updated statistical analysis of historical water levels.

  However, since the proponent wants to encroach on to the existing floodplain with the proposed development and floodproof the site, they were asked to update the statistical analysis to establish if there have been any changes in extreme water levels since 1989. The updated water level information will also be required to design the floodproofing.

- **2. Dynamic Beach Hazard**: As noted in the Zuzek Inc. (2020) Lake Ontario Shoreline Management Plan, we concur with the logic of terminating the dynamic beach limit to non-dynamic features, such as a road. The problem with the statements in the letter from Saugeen Shores is the recent period of high lake levels have shown the walkway at Port Elgin is not the limit of dynamic processes and wave action. For example, at the north end of the site the walkway was damaged by erosion and reinforced with rip rap, as seen in our site photograph from April 30, 2021 (Figure 1). Plus, waves and wind actively transport sand over the walkway and into the parking lot. Refer to Figure 2. The walkway is clearly not the limit of dynamic beach processes and wave action at Port Elgin.

  For reference, a picture of the road at Iroquois Beach in Whitby is provided in Figure 3. The road a more substantial feature than the walkway in Port Elgin and it is protected

with a steel sheet pile wall, concrete blocks, and large concrete rubble. The two sites are not comparable from the perspective of limiting wave action and the extent of the dynamic beach.

Figure 1 – Damaged Walkway, Port Elgin (April 30, 2021)

Figure 2 – Aeolian Transport of Sand Over the Walkway in Port Elgin (April 30, 2021)

Figure 3 – Iroquois Beach, Whitby, Ontario (November 8, 2018)

Please contact me if you have any questions about these comments or any further requirements.

Yours Truly,
Zuzek Inc.

Peter J. Zuzek, MES, CFM, P.Geo.
President

e-cc: Seth Logan, P.Eng., SJL Engineering Inc.

RE: CCV and promenade elevations II

PZ
Peter Zuzek <pzuzek@zuzekinc.com>
To Brandi Walter
Cc Erik Downing; Jennifer Stephens

Reply | Reply All | Forward | ...

Tue 2021-08-17 11:33 PM

Print

**[CAUTION]: This email originated from outside of the organization. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Hi Brandi,

My comments below. Hopefully the comments address your questions. This is a complicated story now and the information is in many documents.

Note: at Port Elgin, CGD = IGLD'85 m. All references below are in IGLD'85 m.

Pete

From: Brandi Walter <b.walter@svca.on.ca>
Sent: August 17, 2021 2:09 PM
To: Peter Zuzek <pzuzek@zuzekinc.com>
Cc: Erik Downing <E.Downing@SVCA.ON.CA>; Jennifer Stephens <j.stephens@svca.on.ca>
Subject: RE: CCV and promenade elevations II

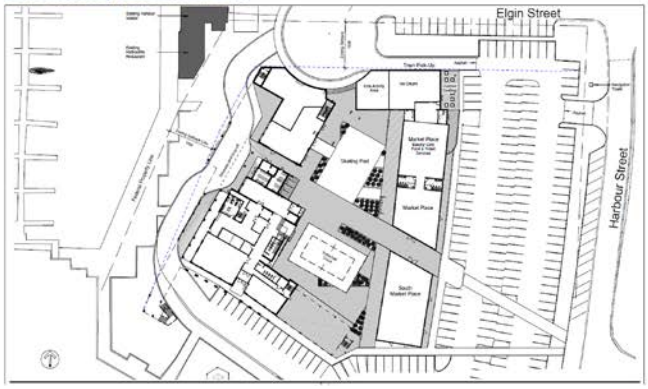
Hi Peter,

Could you clarify a few things for me?

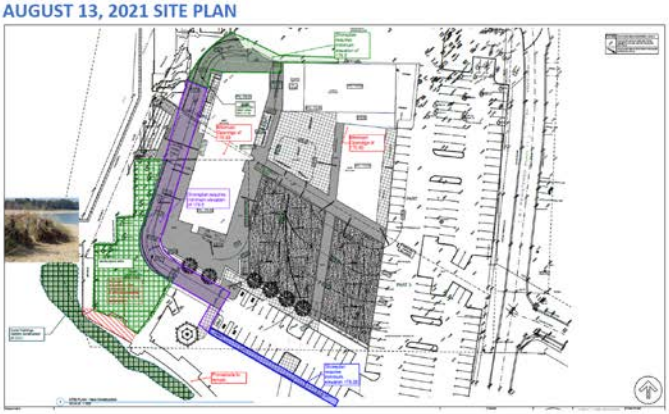
1. The MNR 100 year lake level for this location as we have on file is 177.6 metres. However, based on the analysis, it is actually 177.89? Shoreplan did their statistics on the Goderich and Tobermory gauges. At Goderich they found the 100-year lake level increased to 177.89 m IGLD'85 from 177.80 m IGLD'85. We recently did our own analysis for the Maitland Valley climate change study and got 177.84 m. Very close. Our methods are a little different. I am satisfied with their calculations at Goderich. BUT, it did go up 9 cm at Goderich, which means in theory it could go up 9 cm at Port Elgin.
   -I believe I mentioned this in the comments to Eric, a 100-year lake level that is 9 cm higher at Port Elgin would results in slightly larger waves and more runup, so the Flood Hazard Limit would be further inland than they showed on their Figure 9 map in the July 23, 2021 letter. Not sure if this is worth pursuing.
   -The 1989 MNR publication uses gradients between the Goderich and Tobermory gauges and that is where 177.6 m comes from for Port Elgin.

2. Are you satisfied with Shoreplan's 'Surge' calculations? For the 100-year surge, MNR reported a 100-year surge of 0.67 m at Goderich, Shoreplan got 0.64 m, we got 0.65 m. So yes, I'm satisfied with that. As an aside, we haven't seen the magnitude of surges go up on any of the gauges (i.e., the severity of storms hasn't gotten stronger since 1988). What we have seen is the 100-year static lake level go up, due to the record highs in the last couple of years. Based on what we know and have measured, it seems that increases in the static lake level will be a more significant climate change impact than increases in storm surge.
3. You are satisfied with the proposed floodproofing elevation of 178.12m, correct? Or it is 178.8? Too much back and forth and I need this clarified as I am confused.
   In Table 1 of their July 23, 2021 letter they state the updated Goderich floodproofing level is 178.12, was 178.1 in MNR 1989. I am satisfied with this calculation/method for Goderich. They state at the bottom of page 8 that the 100-year flood level and floodproofing level calculated by MNR (1989) for Port Elgin continue to be used. But they don't actually state what level they plan on using for Port Elgin in the July letter.
   -in the original Shoreplan report, they recommend the 100-year static level 177.43 m (Table A.3) plus a 0.3 m surge be added for the floodproofing standard, to give 177.73 m for Port Elgin.
   -in Bruce's e-mail to me on August 11 he indicated wave uprush for the floodproofing calculations were done at 177.73 m. He recommends a floodproofing elevation of 178.8 m for lowest opening based on the planned slopes for the new sidewalks and grades to the existing promenade. That is 1.07 m to account for wave uprush, which seems reasonable.
   -on the August 13 site plan, they show 178.0 for a walkway, 178.5 for a road, and 178.8 m for lowest openings in buildings. This seems reasonable.
   -as a general comment, they do appear to have scaled back the buildings substantially in this August 13, 2021 site plan versus the one dated Oct. 29, 2020.

OCTOBER 29, 2020 SITE PLAN

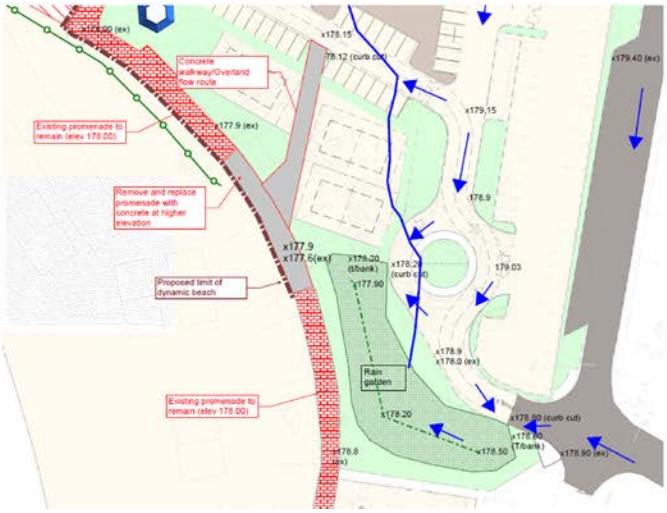


AUGUST 13, 2021 SITE PLAN

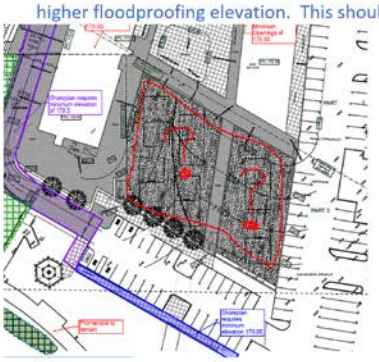


4. Please confirm, the wave effects for the floodproofing elevations have not been addressed? Please confirm you recommend this be done and for which elevation?
   If you go back to their original October 28, 2020 report, they discuss floodproofing on page 7 and 8. They don't actually show any calculations but do report the floodproofing wave level of 177.73 m and state for buildings close to the existing walkway, the minimum opening should be 179.0 m if the land is 177.9 m.
   -now they are saying the road around the buildings should be 178.5 m and the walkways should be 178.0 m. So a little higher on the grades. But the buildings are further back now, so Bruce's latest recommendation for lowest opening is 178.5 m (in his August 11, 2021 e-mail to me) versus 179.0 m. So, it is not stated anywhere but I think he is going with the lower level because the land grade is a little higher and the buildings are further back from the lake. Scary, I think I am thinking like Bruce now …
5. Is there an issue with regards to your comment no. 3 below? No issue.
6. Please clarify what the wave runup elevation is for the 100 year lake level? Need to know this for wave uprush on parking lot.
   On page 4 of their original report from October 28, 2020 they state the runup through the parking lot is 25 cm, giving a flood hazard limit of 177.85 m. This was re-stated in the April 19, 2021 letter from them. They state the wide parking lot and shallow depths are the reason the runup is only 25 cm.

7. It is my opinion, we need the impact to flood control on adjacent properties addressed should there be wave runup at high like levels and a storm drainage from the site and adjacent lands. Need to know what the extent of flooding would be? Do you agree?
   With everything that has been done, the Shoreplan work has been relatively silent on this issue. From the Town's comments, I get the sense the Developer is not doing the parking lots for the southern portion of the site and thus Shoreplan is limiting their work in this area. The July 29, 2021 site plan provides some elevations that are higher than the floodproofing elevation of 178.5 m. See below. They talk about a new concrete section for the walkway below and seem to suggest 177.9 m, which is a bit higher than their calculated Flood Hazard Limit of 177.85 m. But I haven't seen any discussion of flood risk in this area, or any analysis (runup with a new walkway). It is not our job to try to piece this together. The latest August 13, 2021 plan doesn't include this southern area. So, in short, it does need to be formally addressed (with a drawing and description/words).



8. Amanda has provided two site plans attached– aside from the storm drainage issue, please advise if you are satisfied for each site plan that:
    a. Floodproofing elevations have been addressed? Both plans show a lowest opening or finished floor elevation of 178.8 m. I'm satisfied with this elevation for the buildings in their current location. There is the mystery area shaded gray and outlined in red below (with ?). What is this? Do they plan to develop this in the future? Bruce states buildings closer to the beach should have a higher floodproofing elevation. This should be clarified.



    b. Do either, or both plans satisfy your requirements for reducing the dynamic beach limit?
    My understanding of the dynamic beach location is your mapping below (dashed black/white line) from the fall of 2020. Shoreplan has never done the technical analysis we requested to justify a reduction in the dynamic beach hazard limit. So, I would recommend not changing the mapping/dynamic beach limit. They have agreed to remove the damaged section of the walkway (I think). And it appears they are showing an area of dune restoration in the August site plan. I haven't seen anything formal/written on either of these items (it needs to be documented in words somewhere). It also looks like the new development (i.e., road and new parking) is largely out of the dynamic beach. So, I'd recommend you keep your line where it is and permit the restoration work, as per your guidelines, and allow for repair/raising of the existing trail. By keeping the line where it is, you ensure future development won't encroach closer to the lake.

c. What additional information do you require to address either of the above, for each scenario. (The town is proposing two site plans at this time), including wave effects.

-I'm happy with the floodproofing for the development, as per the methods in the technical guide. It doesn't consider climate change but we've beaten that to death.

-details and clarity for the parking lot south of the buildings is needed

If they are going to remove the damaged section of walkway, then the dune restoration should go on this footprint. A cross-section of the dune restoration would be helpful showing land elevations and noting whether additional sand would be added to re-enforce the dune. Since the parking lot is still an unknown, it would be nice to see this dune restoration work continue along the entire beach. It would provide additional flood protection and increase the resilience of the site to high lake levels.

July 26, 2021 Site Plan

-is there anything written to describe the site plan?

-everything should be labeled. There appear to be fantom volleyball courts on the sand beach and between the parking and the walkway. If these are planned/real, they should be labeled. The land cover between the existing walkway and parking lots is not labeled. There is a dashed outline of something south of the Market Place – what is this? The elevation of the new concrete walkway should be confirmed. Wave uprush should be assessed hear for the floodproofing concept. Is there any analysis to show the rain garden has sufficient capacity to hold the street runoff?

-the Flood Hazard Limit should be included with a note stating "for Existing Conditions"

August 13, 2021 Site Plan

-is there anything written to describe the site plan?

-states the damaged walkway will be removed, but after construction, so there is pedestrian access to the harbour during construction. This sounds reasonable but to be sure if gets removed, we should include something that states it gets restored too. Maybe a Phase 1 and Phase 2 approach.

-there are fantom rectangles in the SE corner of the development. What are these – volleyball courts? This should be clarified.

-for the buildings, there is a note "FFL: 179.50" for Finished Floor Level? But also notes in red saying minimum opening of 178.80. Are they the same thing or different?

-the Flood Hazard Limit should be added and noted 'for Existing Conditions". Then reviewers will be able to see the encroachment of the site into the flood hazard limit.

-without seeing the remainder of the site, to the south, the flood risk to the southern portion of the new parking lot can not be evaluated.

If you can address these questions for tomorrow, that would be great!

Kind Regards,

Brandi Walter
Environmental Planning Coordinator
1078 Bruce Rd. 12, Box 150
Formosa ON N0G 1W0
519-367-3040 Ext. 236 *Cell*: 519-369-4282
b.walter@svca.on.ca

From: Peter Zuzek <pzuzek@zuzekinc.com>
Sent: August 11, 2021 10:33 AM
To: Erik Downing <E.Downing@SVCA.ON.CA>
Cc: Jennifer Stephens <j.stephens@svca.on.ca>; Brandi Walter <b.walter@svca.on.ca>
Subject: RE: CCV and promenade elevations II

Hi Erik,

I've gone through the latest Shoreplan report, draft site plan, and Amanda's e-mail. My comments:

Static lake level analysis: the methodology and results are accepted. We recently did the same analysis for our new climate change study for Maitland Valley and we got 177.56 m for the 100-year static lake level. They reported 177.49. So close.

Surge: they didn't provide a table but looks like Goderich 100-year surge is 0.63 m, we got 0.65. Tobermory, we both got 0.34 m. The difference at Tobermory from the update to the historical rate from MNR (0.53 m) is why the analysis should be updated on studies. The MNR information was off by 0.19 m.

Combined Probability to Establish 100-year Lake Level: At Goderich they got 177.89, we got 177.84. Accepted.

Floodproofing: The water component of the floodproofing elevation based on Goderich of 178.12 m is accepted. Our analysis resulted in 178.21 m, due to some minor differences in methodology (we do the analysis monthly, they do yearly maxima). All things considered, it is pretty close.

A few comments on page 8

1) The 100-year lake level (combined static and surge) went from 177.8 m to 177.89 m. They state updating the flood hazard limit is not warranted. With a water level of 9 cm higher, nearshore waves would be a bit larger and runup would be a bit higher. Maybe 15 cm, max. Whether that is worth recalculating the horizontal location of the flood hazard limit is your call. It would basically put more of the development in the flood hazard limit but it is clearly already in the hazard zone. Also, they are proposing to floodproof and the difference in the floodproofing elevation is only 2 cm (178.10 versus 178.12 and that is not significant).
2) Shoreplan is silent on wave affects/runup for the floodproofing elevation in their report. Bruce just replied …

"The 178.8m lowest opening for floodproofing is related to the sidewalk elevations and the slopes from the sidewalk to the existing promenade as discussed in our April 19 letter."

So Bruce is say 178.8 m for sidewalks inland of the walkway. But Amanda's e-mail from July 26 says 178.0/178.5 m for sidewalks and 178.8 for buildings. So this needs to be clarified. Need Shoreplan's final recommendation for both.

3) For reference, in their October 28, 2020 report, Shoreplan state a minimum fill elevation of 177.9 m and building opening of 179.0 m (so it has gone down 20 cm).

Wave Uprush Limit and Flood Hazard Limit: As noted above, Shoreplan says the Flood Hazard Limit has not changed. But the 100-year lake level is 9 cm higher and that would make runup a bit higher too. Up to you whether this is flagged. ***BW – what do you recommend.?*** It doesn't change the floodproofing discussion.

The one aspect of this file I want to flag is the overland drainage. I'm not a drainage expert but I'm not sure we've received a comprehensive package on site drainage. They added a rain garden and it seems like the parking lot water is supposed to drain through the curb cut down a new walkway and over the boardwalk in the middle of the site and into the rain garden from the turn around. If the middle section of the walkway is raised to 177.9 m, as stated by Amanda, wave runup will still propagate inland. So, you have waves running into the volleyball courts during large storms and high lake levels, and if it is raining during the storm, water from the parking lots draining into this area too.

Comments directly on Amanda's e-mail and the draft site plan (attached).

We have made some progress with this round of analysis. Some questions need to be clarified. I'm not sure if the site plan is their formal submission or something being contemplated, so that needs to be clarified. Personally, it would help to see one clean final site plan and a brief letter/memo pulling it all together in one place (floodproofing elevation of the walkway and building openings, new elevation of the walkway, removal of damaged walkway, cross-section of the dune restoration (could extend further south too), site drainage plan, etc.

I'm off Thursday for my daughters birthday. Combining it with a Tobermory trip and site visit to Cabot Head with the Biosphere Association to evaluate their eroded trail/road. Back in the office on Friday.

Pete

From: Erik Downing <E.Downing@SVCA.ON.CA>
Sent: August 10, 2021 1:51 PM
To: Peter Zuzek <pzuzek@zuzekinc.com>
Cc: Jennifer Stephens <j.stephens@svca.on.ca>; Brandi Walter <b.walter@svca.on.ca>
Subject: RE: CCV and promenade elevations II

Great Thanks!

I am out on sites shortly today, then I am not in tomorrow, and Jenn and Brandi are on Holiday so I'll review what you have for us Thursday or so.

Cheers,

Erik Downing, Manager, Environmental Planning and Regulations
1078 Bruce Rd. 12, P.O. Box 150
Formosa, ON N0G 1W0
www.svca.on.ca
Office: 519-367-3040 Extension 241
Cell: 519-369-4460

From: Peter Zuzek <pzuzek@zuzekinc.com>
Sent: August 10, 2021 12:31 PM
To: Erik Downing <E.Downing@SVCA.ON.CA>
Cc: Jennifer Stephens <j.stephens@svca.on.ca>; Brandi Walter <b.walter@svca.on.ca>
Subject: RE: CCV and promenade elevations II

Hi Erik. Sorry for the delays. A week of holidays followed a week of field work in the Bay of Quinte for their SMP. I will look at this after lunch (shortly).

Pete

From: Erik Downing <E.Downing@SVCA.ON.CA>
Sent: August 10, 2021 12:13 PM
To: Peter Zuzek <pzuzek@zuzekinc.com>
Cc: Jennifer Stephens <j.stephens@svca.on.ca>; Brandi Walter <b.walter@svca.on.ca>
Subject: CCV and promenade elevations II

Hi Pete,

Jenn and I are eager to move this item along. More in the news today on this item. Please let us know when we'll receive your response on the most recent submission referenced below by Brandi.

Thanks,

Erik Downing, Manager, Environmental Planning and Regulations
1078 Bruce Rd. 12, P.O. Box 150
Formosa, ON N0G 1W0
www.svca.on.ca
Office: 519-367-3040 Extension 241
Cell: 519-369-4460

From: Erik Downing
Sent: August 5, 2021 9:13 AM
To: Peter Zuzek <pzuzek@zuzekinc.com>
Cc: Jennifer Stephens <j.stephens@svca.on.ca>; Brandi Walter <b.walter@svca.on.ca>
Subject: RE: CCV and promenade elevations

Hello Pete,

How quickly did the holiday glow fade?! Hopefully it survived the holiday and did not get diminished in anticipation to the resuming of regular programing (I hate when dread of backlog creeps into break)!

How quickly could the SVCA expect your comments on this most recent submission indicated below? Jenn is off next week as well as Brandi (Brandi off this week and next) but I am around to keep this item going.

Applicant is eager of course to keep process going.

Thanks,

Erik Downing, Manager, Environmental Planning and Regulations
1078 Bruce Rd. 12, P.O. Box 150
Formosa, ON N0G 1W0
www.svca.on.ca
Office: 519-367-3040 Extension 241
Cell: 519-369-4460

From: Brandi Walter <b.walter@svca.on.ca>
Sent: July 31, 2021 9:45 AM
To: Peter Zuzek <pzuzek@zuzekinc.com>
Cc: Jennifer Stephens <j.stephens@svca.on.ca>; Erik Downing <E.Downing@SVCA.ON.CA>
Subject: Fwd: CCV and promenade elevations

Hi Peter

I can't recall if I officially forwarded this email to you. Can you please review Amandas email and plan in addition to the Shoreplans flood hazard report provided to us last friday. I will be on vacaction for two weeks so Erik will be the contact on this file until I return.

Thank you kindly.

Brandi

Get Outlook for Android

From: Amanda Froese <amanda.froese@saugeenshores.ca>
Sent: Monday, July 26, 2021 11:12:53 AM
To: Brandi Walter <b.walter@svca.on.ca>
Cc: Phil Eagleson <phil.eagleson@saugeenshores.ca>; Kara Van Myall- SaugeenShoresCAO <kara.vanmyall@saugeenshores.ca>; Jennifer Stephens <j.stephens@svca.on.ca>; Erik Downing <E.Downing@SVCA.ON.CA>; Peter Zuzek <pzuzek@zuzekinc.com>; Bruce Pinchin <bpinchin@shoreplan.com>
Subject: CCV and promenade elevations

Brandi,
I left the meeting curious about how we could make your proposed solution fit within the parking lot, and how it would affect drainage and provide 1) protection for the buildings and 2) enable the project to move ahead without the administrative review. I have attached a drawing that is conceptual (and based on a scaled down site plan). I am wondering if it is worth you looking at it and telling us if it meets what your team was trying to recommend. Here is a summary of what we were thinking (and please call to chat at your convenience):

1. Raising the promenade such that it is at all times at elevation 179.90 or above
2. Replacing the section of the promenade to be raised and creating an overland flow route with a concrete path (reverse crown and will act like a concrete channel)
3. Removing the section of the promenade that has been damaged from the break-wall construction and replacing it with dune plantings
4. Installing a 3m wide concrete walkway from the promenade along the west edge of the CCV development, behind the harbour wall.

We believe that these pieces address the raise and relocate sections of the dynamic beach analysis and would result in a new dynamic beach line (shown on the pdf). I used the flood-proofing elevations from newest Shoreplan response letter, with the internal sidewalk to be at the 178.00/178.50 elevations and the building with openings about 178.80, the design seems to be workable and will also be able to take the drainage from Harbour Street/Green Street.

We also intend to:

5. Add dune plantings in front of the promenade (contemplated in the waterfront maintenance plan)
6. Incorporate a rain garden in the future parking lot plan (anticipate this work in 2022)

Please let me know if this is a workable solution, and I am happy to talk it through with you to see your thoughts.

Sincerely,

Amanda Froese, P. Eng. FEC
Director, Infrastructure and Development Services
Town of Saugeen Shores
600 Tomlinson Drive, Box 820, Port Elgin ON N0H 2C0
T 519-832-2008 x119 | **F** 519-832-2140
E amanda.froese@saugeenshores.ca | saugeenshores.ca

Overview Report

Report From: Town of Saugeen Shores

Report To: SVCA Executive Committee

Meeting Date: November 22, 2021

Subject: Permit Application for Cedar Crescent Village

Attachments: (see list of attachments)

Request

Based on the background and supporting engineering that has been provided in support of Regulation 169/06, that the Executive Committee of the SVCA:

1. Deem the application as complete
2. Provide a Decision on the Dynamic Beach Hazard Limit
3. Consider moving to a Section 28 Hearing to approve a Permit with conditions for detailed engineering drawings to the SVCA's satisfaction that are in agreement with:
   - Flood proofing elevations through perimeter walkway/access road elevations and building elevations per Engineer's Recommendations
   - Enhanced landscape area west of CCV and east of the existing Promenade as requested by SVCA.

Report Summary

The Town of Saugeen Shores made an application to the Saugeen Valley Conservation Authority (SVCA) on February 1, 2021 after preconsulting with the Conservation Authority on the proposed Cedar Crescent Village (CCV). The preconsultation dated back to 2019 before the Request for Proposal was issued for the property and the conceptual plans for the development were approved by Town Council in November 2020.

The Town, with the support of the Coastal Engineer, Shoreplan Engineering Ltd, assert that the proposed development meets the test of Regulation 169/06 as we have demonstrated that "the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development".

The Town has worked over several months to further develop the existing conditions profile for both the (1) Flood Hazard Assessment and (2) Dynamic Beach Hazard. On August 27, 2021, the Town was notified that the (1) Flood Hazard Assessment has been accepted and therefore, the only outstanding area to be addressed is in relation to the (2) Dynamic Beach Hazard. The

conclusion of the discussions that have been ongoing since March, is that the technical analysis for (2) Dynamic Beach Hazard were completed however, the technical merits could not be resolved at the staff level with the lack of consensus between the technical experts.

With regards to (2) Dynamic Beach Hazard, the conclusion of SVCA staff is that the review carried out by Shoreplan Engineering Ltd. does not constitute a technical study in accordance with the MNR (2001) Technical Guides for flooding, erosion, and dynamic beaches in support of Natural Hazards Policies of the Provincial Policy Statement. The Town, supported by its Engineer, asserts the work completed constitutes a study using accepted scientific and engineering principles in accordance with the Technical Guides.

With the delays that have occurred to the desired construction timing, we wish to continue advancing the detailed site plan and engineering work once a decision has been rendered on the Dynamic Beach Hazard and therefore, we acknowledge the need for a conditional approval that would require the proponent to update the Site Plan, complete with grading and servicing information along with a justification as to how the development satisfies the conditions of the permit. This includes protection of the development and adjacent properties from flooding.

As the landowner and party to the development agreement, the Town is in the position to ensure any conditions of the Permit are upheld. With this ability, the Town requests that the Executive Committee consider issuing a permit to allow the development subject to conditions set out by the Committee. To date, there are two areas that could be addressed through an updated Site Plan to address the conditions of the permit:

- Flood proofing elevations through perimeter walkway /access road elevations per Engineer's Recommendations
- Enhanced landscape area west of CCV and east of the existing Promenade as requested by SVCA.

Therefore, we ask the Executive Committee, based on the background provided and engineering done to date, both of which support Regulation 169/06, that the Executive Committee give permission to develop under section 3(1) subsection 2(1) if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development. The engineering analysis and ability to incorporate conditions into both the Permit and the Town's Site Servicing Agreement with the Developer (proponent) further support this decision.

Background/Analysis

The Town of Saugeen Shores preconsulted with the Conservation Authority and received correspondence on June 19, 2019 (prior to advancing the Request for Proposal for the property) that noted the following:

> "Based on our review of the site plan, SVCA mapping and the aforementioned policies, SVCA finds the proposed generally acceptable; provided the site plan is amended to accommodate the hazard lands affecting the property. Please see below for further comments."

The letter further highlighted the need to respond to:

- "Shoreline Flood Hazard"
- "15 meters Adjacent to the Flood Hazard" (note should be Flood Level)
- "Dynamic Beach Hazard" (note Dynamic Beach Hazard Limit)

And through subsequent discussions, it was acknowledged, further engineering analysis would be required to address these specific SVCA permissions for development.

Bruce Pinchin, P.Eng and Coastal Engineer, was then retained by the proponent to advance the technical engineering analysis for the development in accordance with those elements noted above. In correspondence to Mr. Pinchin dated, September 10, 2020, regulations staff noted that:

> "As a result of historical alterations, the impacts of the flooding hazards / dynamic beach hazards to the proposed development, adjacent lands, and the impacts to shoreline processes from the development should be assessed."

Shoreplan Engineering Ltd, then took to undertake the study to provide detailed analysis and recommendations on the Lake Huron Shoreline Flooding Hazard, including wave uprush and an assessment of the dynamic beach. Additionally, this reporting responded to the request to clarify impacts to the natural shoreline processes and required flood elevations. The Shoreplan Engineering Report, Port Elgin Beach Hazard Assessment, was completed on October 28, 2020, prior to Council endorsement of the concept plan, and accompanied the submission for the Development Permit on February 1, 2021. This technical analysis included a technical study of the Dynamic Beach Hazard.

On March 3, 2021, and further clarified on March 29, 2021, Town Staff received correspondence from the SVCA noting that they had reviewed the application and noted further areas that needed to be addressed.

Shoreplan Engineering Ltd, responded to each point on April 19, 2021 in a further correspondence and the Town submitted correspondence back to SVCA, dated April 22, 2021. Below is the summary of the responses:

Comment	**April 22nd Response provided:**
Flood Hazard Limit	Shoreplan reviewed the lake levels and storm surges at the stations indicated by SVCA and are of the opinion that they did not change the 100-year lake level from the original analysis.
Flood Proofing	The Engineer provided flood proofing levels to address the 100-year lake level and flood hazard. The details of the development will depend on the acceptance of the 100-year lake level and flood hazard limit (received August 27, 2021).
Dynamic Beach	The original question was to confirm if the dynamic beach existed where the development was proposed. The professional opinion of the engineer is that it does not. The dynamic beach ends at the hardened surfaces of the promenade and harbour walls, which are lakeside of the development. SVCA stated that this opinion was not substantiated.
Overtopping	The analysis explained that impacts due to the lake overtopping of the marina walls would be limited to the marina property, lakeside of the development lands.

Impact to adjacent properties	Due to the size of Lake Huron and the small amount of fill proposed for the development, storage volume in the lake would not be affected, therefore adjacent properties would not be at risk of flooding. Furthermore, the development is landward of the beach and therefore does not affect erosion or natural processes of the beach. Drainage is proposed to be directed toward the harbor to the north.

This expert analysis by the Coastal Engineer was discussed on April 29, 2021 and correspondence was received on May 12, 2021 that outlined additional requirements as critical information required to complete the application. This was the first instance of commentary regarding the complete application and administrative review process.

The request for additional information was narrowed down through this correspondence to the following (1) Flood Hazard Assessment and (2) Dynamic Beach Hazard and there was an acknowledgement that without resolution to these items (1) and (2), the (3) Adjacent Flood and Erosion Impacts, Floodproofing, and (4) Site Plan / Draft Masterplan and Engineering Drawings could not be completed. We accept that conditions will be necessary on this permit to complete this phased approach for submission of (3) and (4) to the satisfaction of the SVCA.

1. Flood Hazard Assessment

Town staff responded on June 4th, 2021 that it had been advised by our Engineer and it is their opinion that with regards to the Flood Hazard Assessment, "**that this sort of study would be best done comprehensively and should not have to be the responsibility of a project proponent"** (their bold)**.** They further note, "we have worked on many projects on Lake Huron with multiple conservation authorities and this is the first time a proponent has been requested to update the design water level."

What was requested was non-standard and outside the industry practice throughout other conservation authorities along Lake Huron. Knowing this information, Town Council did authorize the funding of this additional work at its May 25th Committee meeting at the Town's expense.

Shoreplan Engineering Ltd. completed the additional requested analysis on July 22, 2021 and confirmed that the additional analysis did not change the outcome of the original analysis and the Flood Hazard Limit remains the same as originally proposed in October 2020 Shoreplan report.

Resolution to (1) has now been received (August 27, 2021). Now (2) is the only outstanding item to be decided before a conditional approval can be advanced. We offer the following on (2) Dynamic Beach Hazard:

2. Dynamic Beach Hazard

The Town and its Coastal Engineer did not and still do not agree with the suggested approach to assessing the Dynamic Beach Hazard and the Town did not authorize the requested additional work. The Town finds it concerning that once again, a different standard is being applied to the Port Elgin Main Beach location compared to other locations within the SVCA Watershed where permits have been issued and further, that the impact of the walkway/promenade is being discounted to its relevance at this location.

Reviewing aerial photographs, as suggested, only shows the location of the water line when the photo was taken. It is not possible to differentiate between beach movement and changes in water level. A detailed analysis of dynamic beach movement on shorelines without dunes requires a 2D or 3D sediment transport models, and those models will stop beach evolution when they hit a hardened structure like the walkway/ promenade. Shoreplan's, April 19 letter provided an example of using a 2D profile model for a different site in Saugeen Shores illustrating that a hardened structure clearly impacts the limit of the Dynamic Beach Hazard.

Zuzek Inc. completed a Lake Ontario Shoreline Management Plan for three Conservation Authorities in 2020. That study included 16 dynamic beaches classified as stable and they used the default allowance to determine the setback rather than calculating a limit. That study includes the paragraph "An example of the dynamic beach hazard limit for Iroquois Beach in Whitby is provided in Figure 5.7. The lakeward limit is 200 m offshore of the waterline and the landward limit extends 15 m inland from the 100-year flood level plus 30 m for the dynamic beach allowance. If the setback intersected a feature other than sand beach, such as the road in Figure 5.7, **the hazard limit is terminated at the non-dynamic feature**." (our bold, page 59, November 5, 2020).

The Lake Ontario Shoreline Management Plan shows the dynamic beach hazard limit at the lakeward edge of an asphalt pathway and boardwalk adjacent to Whitby Harbour. The path and boardwalk are within the flood hazard limit. This is the same condition as at Port Elgin, yet the report author is insisting on a different definition of the dynamic beach hazard limit.

The Engineer's opinion is that the parking lot area is not acting as a dynamic beach; it is landward of the walkway/promenade and harbour walls and does not go through continuous change due to natural erosion or accretion. The Town grades and maintains this area as a parking lot. The parking lot function has been in place for over a century. Predominately re-graded in the spring and after rainfall events due to runoff. The Town maintains this area in accordance with the Beach Maintenance Plan.

The Conservation Authority staff agreed to rereview the need for the additional Dynamic Beach Hazard study and a response was received on July 22, 2021. This letter noted there was a lack of "scientific evidence" to prove that the existing walkway is a "hardened" structure that limits dynamic beach movement. We contest this statement, as the Coastal Engineer on the project has provided the scientific evidence and the Conservation Authority's own expert acknowledges that hardened surfaces, like the promenade, terminate the dynamic beach feature. Furthermore, the Conservation Authority's expert acknowledged that sand that washes onto the parking lot does not and will not end up back on the beach. These are two key points made by Shoreplan to support their opinion.

It was further noted in the July 22, 2021 SVCA letter that:

> "a re-designed walkway (i.e., location and elevation) and dune restoration could protect the site with a combination of nature-based solutions (e.g., dune restoration) and traditional grey infrastructure (e.g., raised, and re-aligned walkway). Subject to appropriate and approved design, the flood hazard and dynamic beach limit could be re-evaluated for the post-restoration scenario."

This statement in itself, **confirms** that the promenade is the hardened feature that limits the Dynamic Beach. Acknowledging an ability to re-design the walkway, confirms the opinion of the Engineer (and SVCA's own expert) that the parking lot area is not acting as a dynamic

beach; the proposed development area is landward of the walkway/promenade and does not go through continuous change due to natural erosion or accretion.

The Shoreplan Engineering work constitutes a study using accepted scientific and engineering principles in accordance with the MNR Technical Guides. A licenced Professional Engineer completed a site review to observe and document the physical characteristics of the site. Wave conditions at the beach were determined using numerical models. Typical means of assessing the dynamic beach allowance, including a field assessment of dunes and the use of numerical profile adjustment models, were discounted as not applicable at this site. Processes at the beach were considered relative to other beaches in Ontario, based on 40 years of experience in coastal engineering on the Great Lakes. A professional opinion was offered by a professional engineer licenced in Ontario.

We conclude that the (2) Dynamic Beach Hazard technical study has been completed and should not represent a rationale to continuing to hold up the permit approval and hence the request on August 17, 2021 for both and Administrative Review and Section 28 Hearing.

Conclusion

With the delays that have occurred to the desired construction timing, we wish to continue advancing the detailed site plan and engineering work once a decision has been rendered on the Dynamic Beach Hazard to complete the application. We acknowledge the need for a conditional approval that would require the proponent to update the Site Plan, complete with grading and servicing information along with a justification as to how the development satisfies the conditions of the permit. This includes protection of the development and upstream properties from flooding.

Ontario Regulation 169/06 states that a Conservation Authority may grant permission for development within the limits of natural hazards “if in its opinion the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development.” This requirement can be satisfied through:

- Shoreplan Engineering Ltd.’s recommended flood-proofing and grading requirements;
- Implementation of the Town’s Beach Maintenance Plan that can carry over into conditions of the permit; and
- Conditions that can further be incorporated into the Site Servicing Agreement between the Town and Developer that is noted in the signed lease agreement.

Through discussions with staff in August, it was acknowledged that the following two areas could be addressed through an updated Site Plan to address the conditions of the permit:

- Flood proofing elevations through perimeter walkway /access road at elevations and building elevations per Engineer’s Recommendations
- Enhanced landscape area west of CCV and east of the existing Promenade as requested by SVCA.

Therefore, we ask the Executive Committee, based on the background provided and engineering done to date, both of which support Regulation 169/06, that the Executive Committee

1. Provide a decision as to the Dynamic Beach Hazard Limit being defined by the lakeward edge of the hardened walkway (promenade).
2. If the Committee accepts the technical assessment carried out by Shoreplan Engineering Ltd. and deems the Dynamic Hazard Assessment complete, deem the

application as complete as all requested studies have been submitted if Dynamic Beach is satisfied.

3. If #2 is satisfied, move to a Section 28 Hearing to approve a Permit with conditions for detailed engineering drawings to the SVCA's satisfaction that are in agreement with:
    - Development Proposal to include structures within the Flood Hazard Limit
        - Flood proofing elevations through perimeter walkway/access road elevations and building elevations as per Engineer's Recommendations
        - Enhanced landscape area west of CCV and east of the existing Promenade to satisfy the Dynamic Beach Hazard considerations.

Attachments

- Preconsultation, June 19, 2019
- Preconsultation Comments, September 10, 2020
- Shoreplan Engineering Report, October 28, 2020
- Application February 1, 2021, including approved Concept Plan November, 2020
- SVCA Correspondence, March 3, 2021
- SVCA Correspondence March 29, 2021
- Shoreplan Engineering Report, April 19, 2021
- Town Correspondence, April 22, 2021
- SVCA Correspondence, May 12, 2021
- Town Correspondence, June 4, 2021
- Town of Saugeen Shores, Beach Maintenance Plan
- SVCA Correspondence, July 22, 2021
- Shoreplan, SVCA Response Letter, July 23, 2021
- Town Correspondence, Executive Committee Request, August 17, 2021
- SVCA Correspondence, August 27, 2021
- Bruce Pinchin, P. Eng. Curriculum Vitae

Cedar Crescent Village SVCA Permit Application

Presentation to SVCA Executive Committee

November, 2021

Outline

- Introduction
- Site Context
- Proposed Development
- Process:
  - Pre-consultation
  - First Submission
  - Subsequent Submissions
- Technical Discussion on Dynamic Beach Hazard Limit
- Conclusion/Request for Decision

Introduction

- Cedar Crescent Village is a Private-Public Project that is being developed at the Port Elgin Main Beach with the objective of revitalizing the Port Elgin Waterfront.
- The land is owned and maintained by the Town of Saugeen Shores and is currently beach parking. It is also home to the Flea Market. As the owner of the land, the Town of Saugeen Shores is the applicant.
- Previous uses of the space included, a Casino, Steam Train Station and shop, mini-golf course.
- The private developer's group (Cedar Crescent Village) has prepared design concepts and Town Council has endorsed these concepts. They were selected through a request for proposal process to develop lands for the Town.
- The revitalization of the space is within the Regulated area of the SVCA and the team seeks approval of the permit to continue with development.
- We are here to request that the Executive Committee review our application as complete and to issue a permit with conditions that relate to the completion of Engineering Drawings.

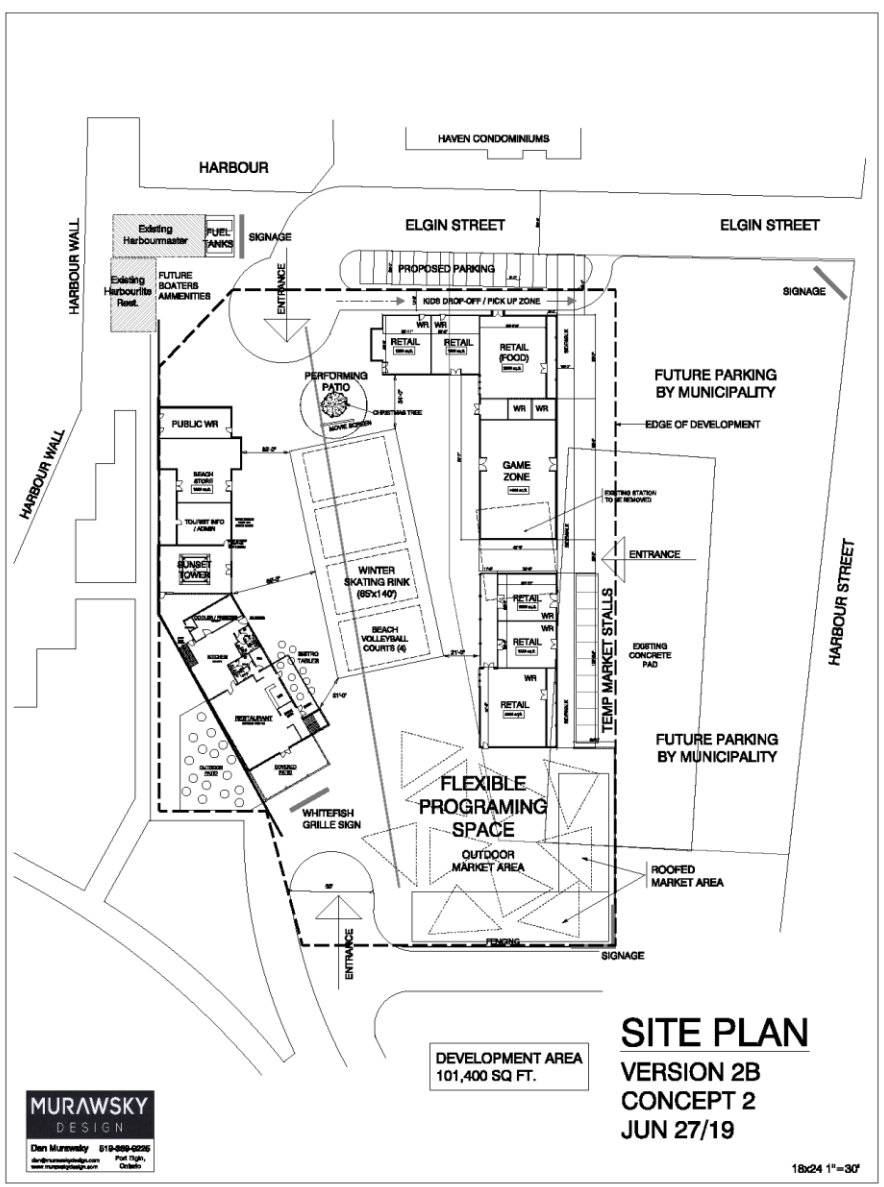
Site Context

Site Context

Site Context

Proposed Development

- Restaurant/banquet facility
- Tourism/Town services
- Outdoor programming space
- Beach related commercial
- Family Friendly activities
- Development within the Hazard limits / acknowledge the need to satisfy the conditions of the SVCA as highlighted in the pre-consultation meeting specific to Flooding and Dynamic Beach Hazards



Pre-consultation

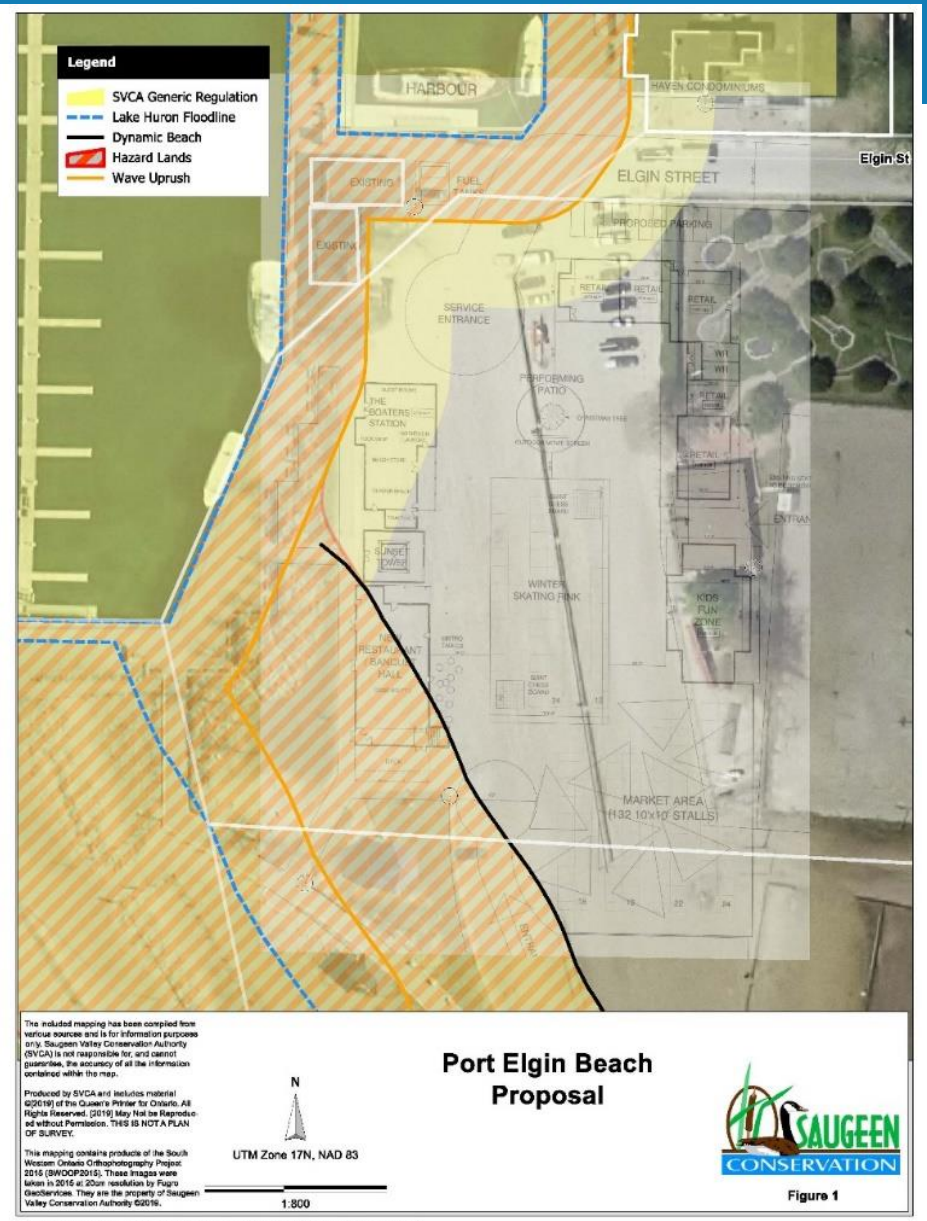
Town Staff and Conservation Authority Staff met to discuss the proposed development in 2019 Comments received at that time were that *Based on staff's review of the proposed site plan, it appears the following works are proposed within the SVCA's Regulated Area:*

- Service entrance off Elgin Street and an access road at the south limit of the property;
- Structures (retail building, boaters station, sunset tower, and banquet hall;
- Potentially new fuel tanks (it is not clear on the plan if these are existing or proposed); and,
- Grading and site alteration associated with the above.

In order to review the application, SVCA required the following items to be addressed:

- Natural Hazards
  - "Shoreline Flood Hazard"
  - "15 meters Adjacent to the Flood Hazard" (note should be Flood Level)
  - "Dynamic Beach Hazard" (note Dynamic Beach Hazard Limit)
- Natural Heritage
  - Fish Habitat
  - Habitat of Endangered Species and Threatened Species

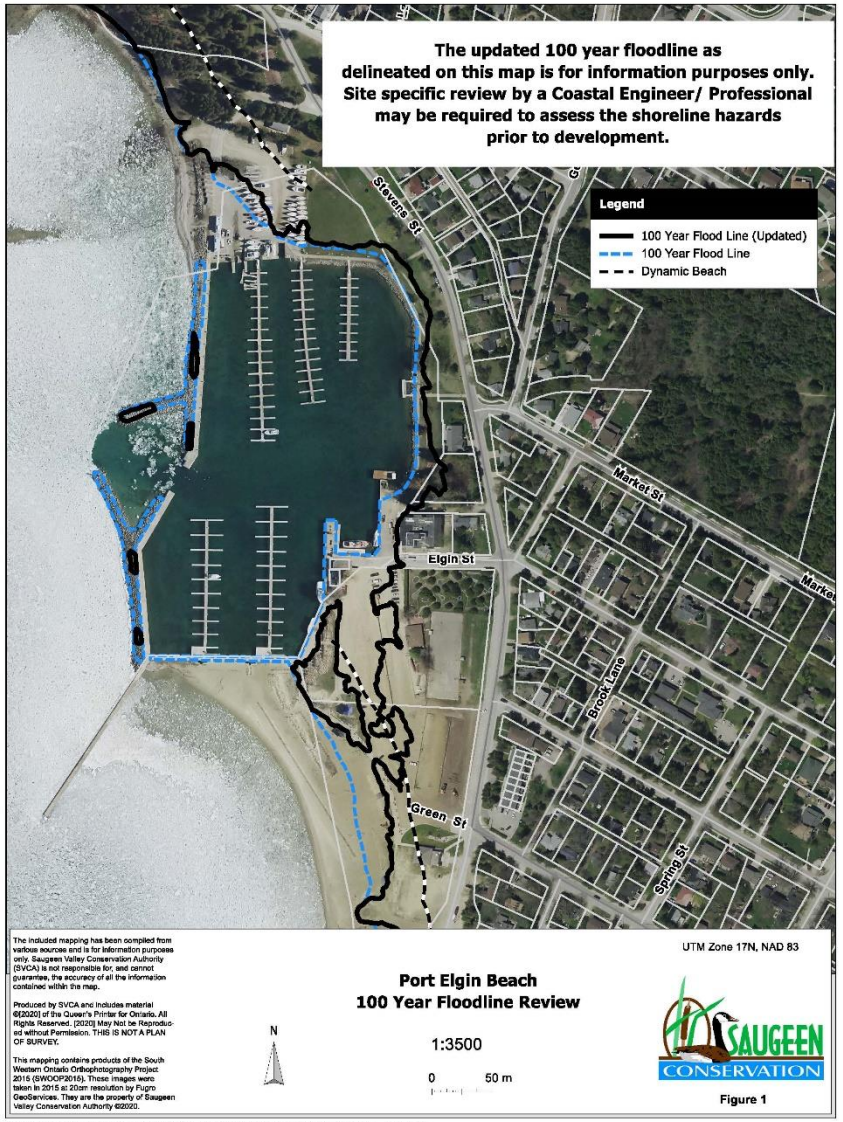
The options to address the Natural Hazards item were to either move buildings and structures out of the hazard lands or to provide the SVCA with additional information with regards to the shoreline hazards. There were no requirements to prepare an EIS for the Natural Heritage Items, as long and Stormwater Management was provided.



Pre-consultation Continued

Option to provide further information:

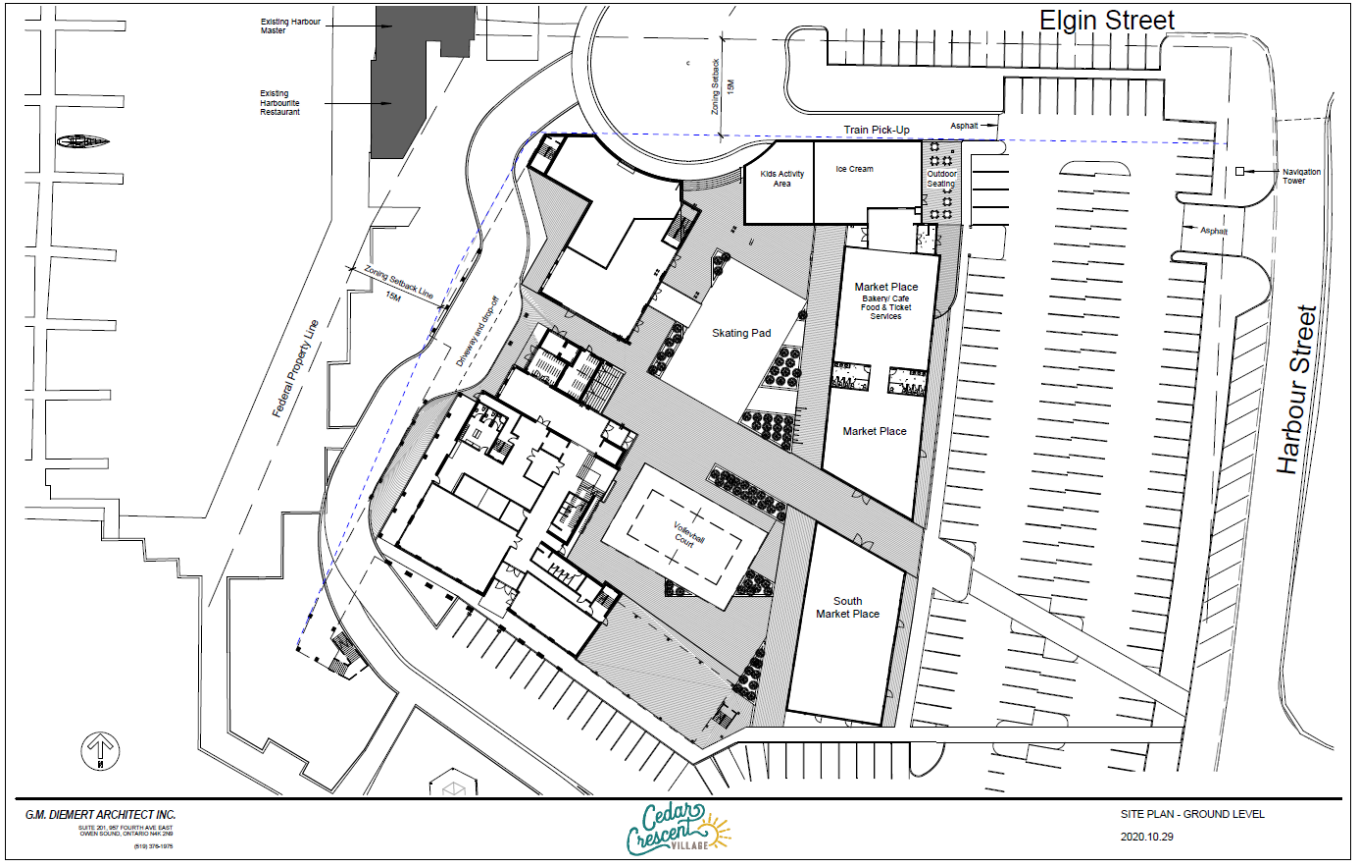
- SVCA did update 100-year lake levels following the pre-consultation meeting
- However, SVCA further required the flooding hazards/dynamic beach hazards to be assessed in relation to impacts from the development.
- This assessment was to be in two phases:
  - Phase 1:
    - Assess the most landward limit of the flooding hazard, including wave uprush, and other water related hazards
    - Assess the dynamic beach, confirm that it exists and the landward limit
  - Phase 2:
    - Review development proposal (if remaining in the flood hazard) for impacts of shoreline processes



First Submission (February 1, 2021)

Submission included:

- Port Elgin Beach Hazard Assessment, Shoreplan Engineering Ltd. Dated October 28, 2020
- Plan of Survey, Hewitt and Mile Limited, OLS Dated October 2019 and
- Site Plan, Ground Level for Cedar Crescent Village, G.M. Diemert Architect Inc, dated October 29, 2020



SVCA provided comments on this submission (March 3rd, 2021) requesting further information on:

a. Delineation of the 100 year flood line,
b. Delineation of the shoreline flood hazard limit,
c. Delineation of the dynamic beach hazard limit,
d. Impacts to adjacent lands from the proposed development; and,
e. The proposed development could be at risk from the shoreline hazards,

SVCA was not satisfied that the submission addressed:

- The proposed development would not have a negative effect on natural shoreline processes and
- The proposed development will not have an impact to control flooding, erosion, pollution, dynamic beaches or the conservation of land

A meeting on March 11th provided further clarity on the report prepared by Mr. Zuzek that formed the basis of the comments.

Second Submission (April 22, 2021)

Comment	April 22nd Response provided:
Flood Hazard Limit	Shoreplan reviewed the lake levels and storm surges at the stations indicated by SVCA and are of the opinion that they did not change the 100-year lake level from the original analysis.
Flood Proofing	The Engineer provided flood proofing levels to address the 100-year lake level and flood hazard. The details of the development will depend on the acceptance of the 100-year lake level and flood hazard limit (received August 27, 2021).
Dynamic Beach	The original question was to confirm if the dynamic beach existed where the development was proposed. The professional opinion of the engineer is that it does not. The dynamic beach ends at the hardened surfaces of the promenade and harbour walls, which are lakeside of the development. SVCA stated that this opinion was not substantiated.
Overtopping	The analysis explained that impacts due to the lake overtopping would be limited to the marina, lakeside of the development lands.
Impact to adjacent properties	Due to the size of Lake Huron and the small amount of fill proposed for the development, storage volume in the lake would not be affected, therefore upstream properties would not be at risk of flooding. Furthermore, the development is landward of the beach and therefore does not affect erosion or natural processes of the beach. Drainage is proposed to be directed toward the harbor to the north.

Third Submission (June 4th, 2021)

Comment	June 4th Response
Flood Hazard Assessment	The study being requested should not be the responsibility of one proponent and affects all waterfront properties throughout the watershed. Staff and Council however, approved the budget request to prepare this analysis, noting that it may become the new standard in SVCA regulated areas adjacent to Lake Huron.
Wave Uprush Elevation Justification	Additional cross-sections south of the development lands were added to the Flood Hazard Assessment when updated for the new model of Lake Huron.
Dynamic Beach Hazard (including climate change and consideration to re-align the walkway)	Reviewing aerial photographs as suggested cannot show the difference between beach movement and changes in water levels. 2D or 3D sediment transport models are required and these models stop beach evolution when they hit a hardened surface like the promenade. A 2020 Lake Ontario Study concluded the same.
Adjacent Flood and Erosion Impacts and Floodproofing	TBD as agreed
Site Plan/Draft Master Plan and Engineering Drawings	TBD as agreed

Subsequent Comments (July 2021)

Comment	July 23rd Response
100-year lake level	Continue to use the 100-year lake level as per original assessment, as there was only a 9cm increase at Goderich and a 6cm decrease at Tobermory.
Wave Uprush	Wave uprush is not simply an elevation. It is a line drawn on the plan that represents multiple elevations and is driven by inland incursion, not highest elevation as indicated in the comments. Using the methodology proposed by SVCA would reduce the flood hazard limit.
Flood Hazard Limit	3 additional cross-sections were added for the area south of the development lands. Adding the new profiles did not change the outcome of the original analysis and the Flood Hazard Limit remains the same as originally proposed in the October 2020 Shoreplan report.
Dynamic Beach	This item remains outstanding. Though Town Staff reviewed the SVCA proposal to rebuild +/-40m of the promenade, remove a section and replace with enhanced dune plantings. These works could be accomplished through the Site Servicing Agreement with the Developer. They however do not satisfy the requirement for a study, but do reinforce the Engineers opinion that the Dynamic Beach Hazard terminates at the hardened surface of the promenade.

Where we are today

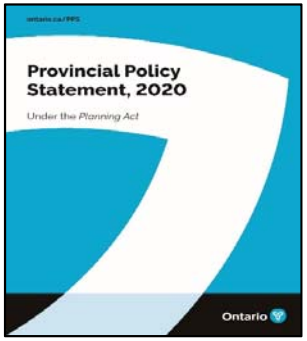
Items Required to be satisfied to be deemed complete:	
Flood Hazard Assessment	Resolved as confirmed August 27, 2021.
Dynamic Beach Assessment – only outstanding item	The professional engineer's opinion is that the dynamic beach hazard terminates at the hardened walkway of the promenade. Suggested technical study will not clarify dynamic beach processes.
Site Plan/Draft Master Plan and Engineering Drawings	Proponent could not complete the detailed engineering grading design without the acceptance of the flood proofing elevations, or acceptance of the dynamic beach hazard limit. These will be submitted as a condition of approval as originally identified in the two phases of the submission process.

Dynamic Beach Hazard Limit

SVCA pre-consultation comments leading to first submission:

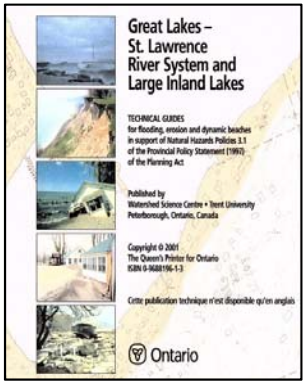
- Since a large portion of the proposed restaurant/banquet hall and southern access road are largely located within the dynamic beach hazard SVCA staff recommended changing the site plan or completing a coastal study to determine ‘if the hazards are located appropriately’.
- Decision was made to engage an engineer specializing in Coastal Reports to determine the Dynamic Beach Hazard Limit.
- Shoreplan Engineering was retained to carry out the analysis.

Natural Hazards



Provincial Policy Statement

Defines natural hazards



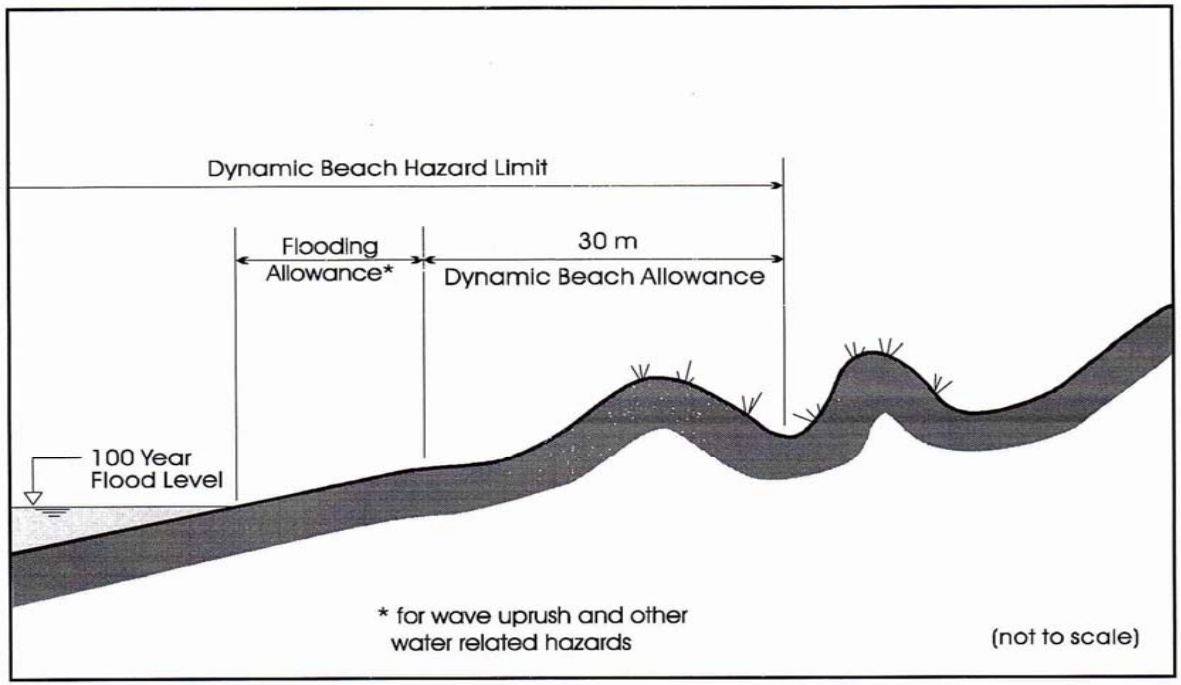
Technical Guides

Describe methods used to delineate hazards

These methods include the use of province wide defaults which may be superseded with site-specific studies.

Dynamic Beach

- The dynamic beach hazard is one of the natural hazards
- The dynamic beach allowance defines the dynamic beach hazard limit



Dynamic Beach

- The dynamic beach allowance does not have to be the 30m default allowance
- It may be “a dynamic beach allowance based on a study using accepted scientific and engineering principles”

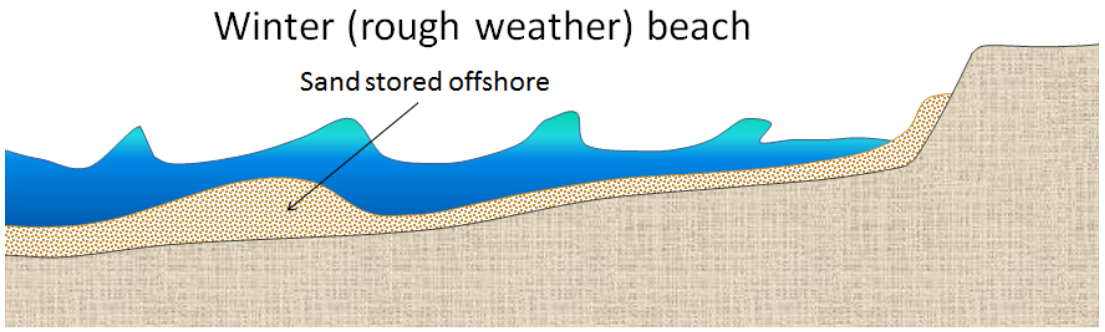
100-Year Flood Level

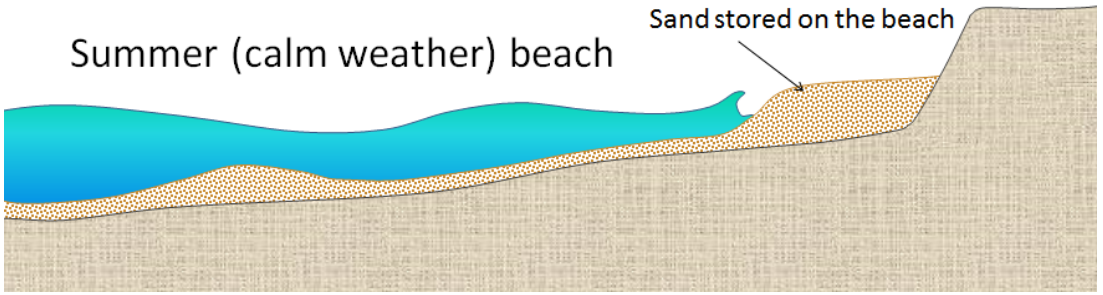
Default Dynamic Beach Limit

Proposed Dynamic Beach Limit

Role Of Sand On A Beach

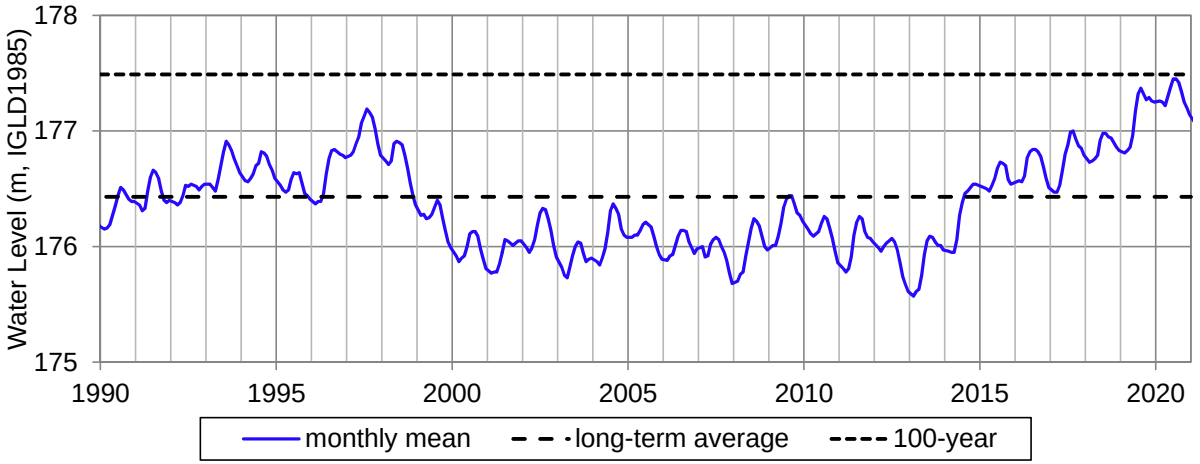
SEASONAL CYCLE OF A BEACH





Water Levels

- Beach profiles also respond to changing water levels
- Lake Huron levels rose rapidly from 2013 to 2020, following 12 years of very low levels



Dynamic Beach Allowance

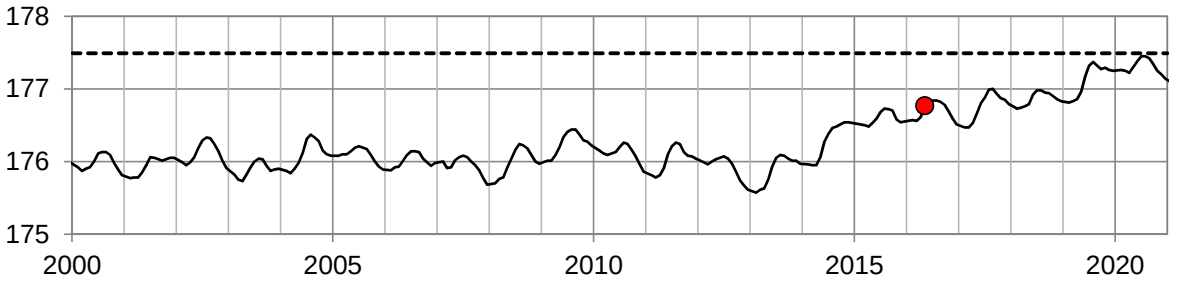
MNR Technical Guides: "*Defined portions of the dynamic beach means those portions of the dynamic beach which are highly unstable and/or critical to the natural protection and maintenance of the first dune feature and/or beach profile where development would create or aggravate flooding or erosion hazards, cause updrift and/or downdrift impacts and/or cause adverse environmental impacts*."

- The purpose of the allowance is to protect dunes and beaches.
- Its purpose is not to force the restoration of an already altered beach.
- The 30m allowance is a province wide default. It needs to be broad enough to provide a suitable allowance on highly dynamic shores, but by its general nature, it cannot apply to all situations.

Dynamic Profile Adjustment

North of Grand Bend

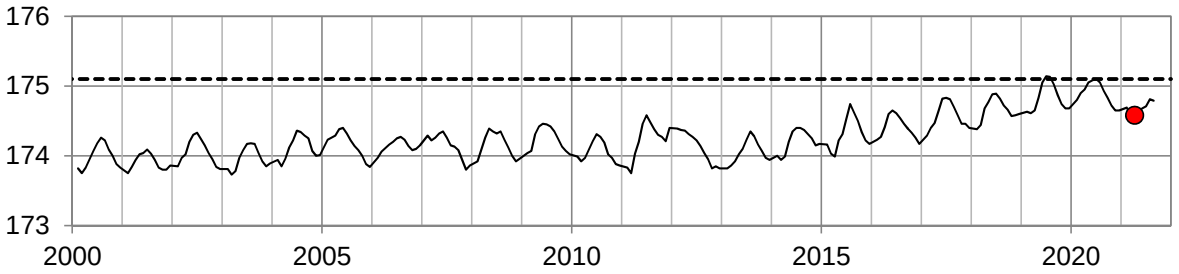
April 2016



Dynamic Profile Adjustment

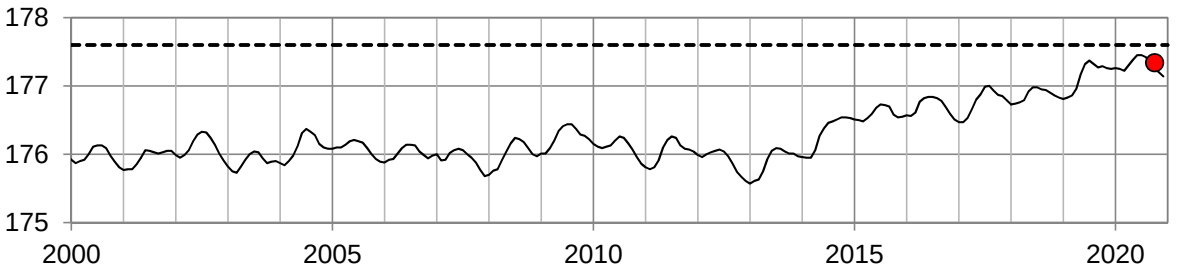
Port Stanley

March 2021



Port Elgin

Sept 2020



Port Elgin

September 2020

Port Elgin

September 2020

Port Elgin

September 2020

Port Elgin

September 2020

Port Elgin

September 2020

Port Elgin

September 2020

Port Elgin

September 2020

Dynamic Beach Hazard Limit

Default allowance (30m)

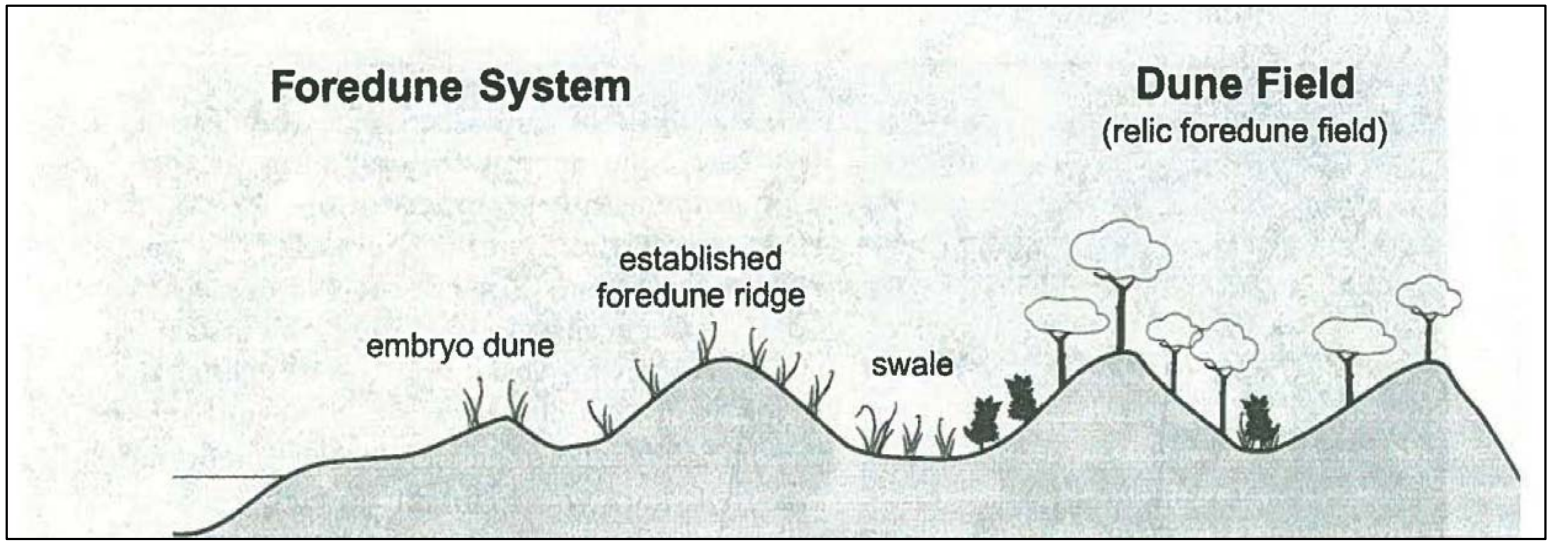
OR

Site Specific Study

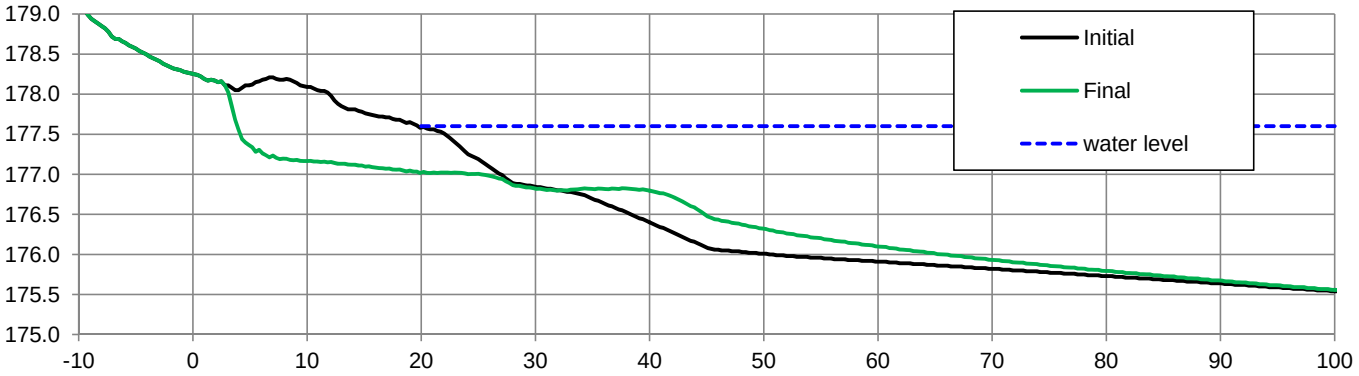
1. Assessment of dune formations
2. Numerical Models
3. Physical Obstructions
   - Infill (adjacent structures)
   - Existing barriers (walls, bluffs, roads)

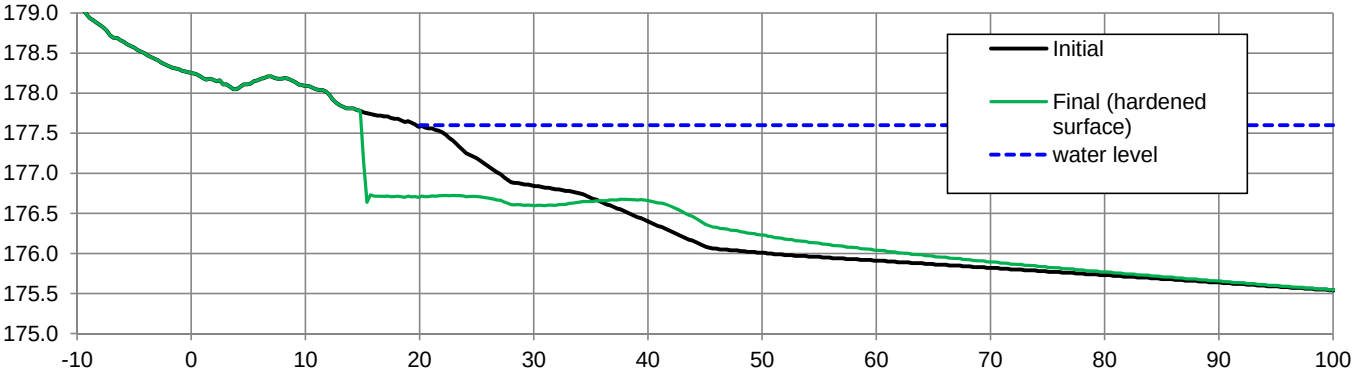
Dune Assessment

LANDWARD SIDE OF THE FOREDUNE



Numerical Models





Physical Limits

MNR Technical Guides: "*There are several circumstances under which natural factors may require redefining the landward limit of the dynamic beach hazard based on field investigations.*"

"These include: On some low shorelines plains, the beach and associated dune deposits …. may be of such low height and width that the flooding hazard is at a higher elevation or extends landward of the beach deposits."

This is the case at Port Elgin.

Physical Limits

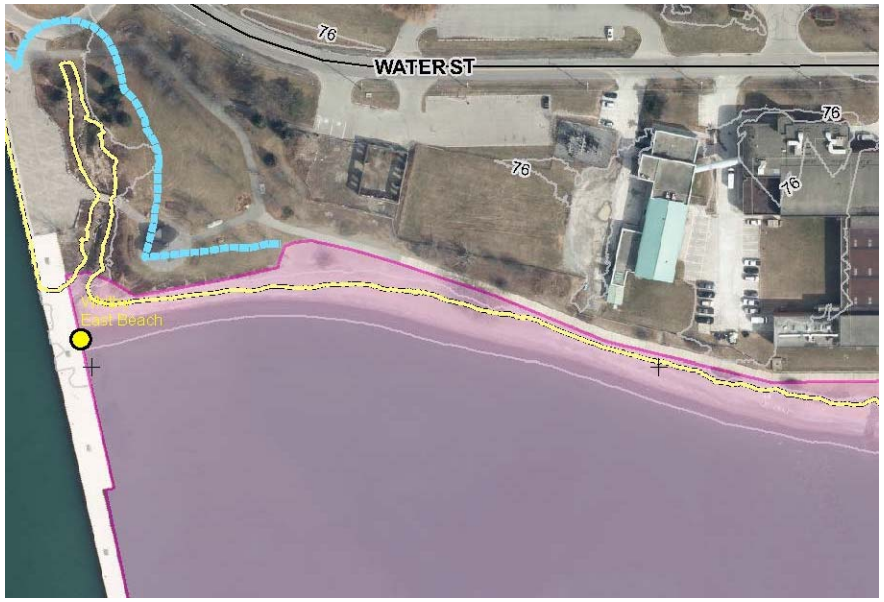
MNR Technical Guides: *"In this case the landward limit of the dynamic beach hazard is mapped as the lesser of the landward boundary between the beach and associated dune deposits and the material forming the low plain …."*

There is no low plain at Port Elgin.

The promenade and graded parking lot act like a low plain.

The landward limit of the dynamic beach allowance is the boundary between the beach and the promenade.

Physical Limits



Asphalt path and boardwalk define the dynamic beach hazard limit at Whitby

In the Lake Ontario Shoreline Management Plan (Zuzek Inc., 2020)

Engineering Principles

SHOREPLAN'S SITE-SPECIFIC STUDY

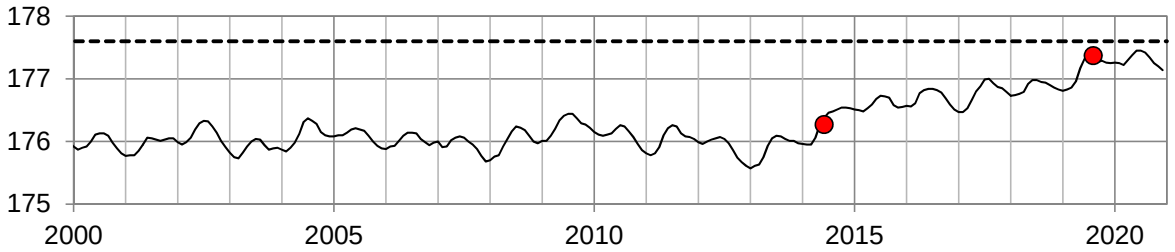
- Completed a field review to observe and document the physical characteristics of the site
- Determined design wave conditions on the beach using numerical models
- Discounted the use of dune assessment
- Discounted the use of numerical profile adjustment models
- Considered this site relative to other beaches in Ontario, based on 40 years of experience in coastal engineering on the Great Lakes
- We are professional engineers and this is our professional opinion.

SVCA Request

Methodology recommended in SVCA letter May 12, 2021:

1. A long-term shoreline change analysis over the full range of water level conditions using historical aerials and recent orthophotography.
2. Analysis of future beach stability for ice-free winters and exposure to storms 365 days of the year.
3. Other potential analyses to evaluate a reduction in the 30 m dynamic beach allowance.

SVCA #1 - Aerial Analysis



SVCA #2 - Ice-Free Winters

- There is no scientific consensus on the future extent of winter ice cover on the Great Lakes.
- Even with reduced lake-wide ice cover, the sheltered area in the lee of the breakwater will ice over.
- Notable profile changes have not occurred landward of the promenade during severe storms. There is no reason to expect they would occur during an ice-free winter.

SVCA #3 - Potential Analyses

The suggestion that other analysis is required to evaluate a potential reduction in the 30 m dynamic beach allowance is too open-ended.

Further analysis will not provide any relevant information.

This would result in a repeat of unnecessary work like that of the water level analysis and add unnecessary delays to the project.

Conclusions

Application is complete

- ✓ Costal Report to address
  - ✓ Shoreline Flood Hazard
  - ✓ 15 metres adjacent to the Flood Level (superseded by Wave Uprush Analysis)
  - ✓ Dynamic Beach
- ✓ Drawings to show development proposal

Flood Hazard Limit

- ✓ Resolved.

Dynamic Beach Hazard Limit

- ? Industry standard review and professional opinion of licenced engineer is that the Dynamic Beach Hazard limit ends at the hardened walkway (Promenade)

Final Site Plan/Master Plan and Engineering Drawings

- Flood proofing is required for development within the Hazard limit and the elevations
- Conditions of the permit can direct the details of the engineering drawings

Request

Request of Executive Committee:

1. Provide a decision as to the Dynamic Beach Hazard Limit being defined by the lakeward edge of the hardened walkway (promenade).
2. Deem the application as complete as all requested studies have been submitted if #1 is satisfied.
3. If #2 is satisfied, move to a Section 28 Hearing to approve a Permit with conditions for detailed engineering drawings to the SVCA's satisfaction that are in agreement with:
   - Development Proposal to include structures within the Flood Hazard Limit
     - Flood proofing elevations through perimeter walkway/access road elevations and building elevations as per Engineer's Recommendations
     - Enhanced landscape area west of CCV and east of the existing Promenade as requested by SVCA.

Cedar Crescent Village SVCA Permit Application

Presentation to SVCA Executive Committee

November 22, 2021

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, Fax 519-367-3041, publicinfo@svca.on.ca, www.svca.on.ca

June 19, 2019

Town of Saugeen Shores
600 Tomlinson Drive
Port Elgin, ON N0H 2C0

Attention: Jay Pausner, Supervisor, Development Services

Dear Mr. Pausner:

Re: SVCA Pre-Consultation - Proposed Port Elgin Beach Development
Roll No. 411046000335300
Plan 259, Harbour, Part BLK 2
Geographic Town of Port Elgin
Town of Saugeen Shores

It is the understanding of Saugeen Valley Conservation Authority (SVCA) staff that the Town of Saugeen Shores is interested in developing the above-noted property and you have asked staff to provide preliminary comments on the attached site plan. The regulatory comments provided in this correspondence are in accordance with the SVCA's mandate, the SVCA Environmental Planning and Regulations Policies Manual, amended October 16, 2018; and the pre-submission consultation comments regarding *Planning Act* matters, are in accordance with the Memorandum of Agreement between the Authority and the County of Bruce relating to Plan Review.

Based on our review of the site plan, SVCA mapping and the aforementioned policies, SVCA finds the proposed generally acceptable; provided the site plan is amended to accommodate the hazard lands affecting the property. Please see below for further comments.

SVCA Regulation

Portions of the property are subject to the SVCA's Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 169/06, as amended). This Regulation is in accordance with Section 28 of the *Conservation Authorities Act* R.S.O, 1990, Chap. C. 27, and requires that a person obtain the written permission of the SVCA prior to any "development" within a Regulated Area or alteration to a wetland or watercourse.

"Development" and Alteration

Subsection 28(25) of the *Conservation Authorities Act* defines "development" as:

a) the construction, reconstruction, erection or placing of a building or structure of any kind,

b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure,
c) site grading, or
d) the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere.

And;

According to Section 5 of Ontario Regulation 169/06, as amended, alteration includes the straightening, diverting, or interference in any way with the existing channel of a river, creek, stream or watercourse, or the changing or interfering in any way with a wetland.

To determine where the SVCA's area of interest is located associated with our Regulation on the property, please refer to the SVCA's online mapping program, available via the SVCA's website at http://eprweb.svca.on.ca. Should you require assistance, please contact our office directly.

We have also attached a map for ease of reference, which illustrates the proposed development in relation to SVCA's regulated area. The SVCA regulated features affecting the subject property are the dynamic beach hazard and the Lake Huron shoreline flood hazard (Lake Huron floodline plus 15 metres wave uprush) plus a 15 metre allowance adjacent to the flood hazard.

SVCA Permission for Development

Based on staff's review of the proposed site plan, it appears the following works are proposed within the SVCA's Regulated Area:

- Service entrance off Elgin Street and an access road at the south limit of the property;
- Structures (retail building, boaters station, sunset tower, and banquet hall;
- Potentially new fuel tanks (it is not clear on the plan if these are existing or proposed); and,
- Grading and site alteration associated with the above.

Shoreline Flood Hazard:

In general, no new development is permitted within the shoreline flood hazard and dynamic beach hazard; with the exception of the Elgin Street access, which may be permitted, provided it can be demonstrated to SVCA that the control of flooding, erosion, pollution, or the conservation of land is not negatively affected. It is likely SVCA conditions for construction of the access would include a satisfactory lot grading and erosion control plan that addresses the above tests. Proposed development for the installation of fuel tanks within the flood hazard is not supported by SVCA's policies for development within flood hazards. As such, it is recommended the site plan be amended to show proposed fuel tanks outside the flood hazard.

15 Metres Adjacent to the Flood Hazard:

Development and site alteration for the construction of new buildings and associated site grading proposed within 15 metres to the flood hazard is generally permitted provided it can be demonstrated

to SVCA that the control of flooding, erosion, pollution, or the conservation of land is not negatively affected. This condition must be demonstrated in satisfactory lot grading and erosion control plans.

Dynamic Beach Hazard:

As shown on the attached map, it appears a large portion of the proposed restaurant/banquet hall and southern access road are largely located within the dynamic beach hazard as shown on the attached map. Unfortunately, SVCA's policies for development within the dynamic beach hazard do not support new development within the dynamic beach hazard limit. As such, SVCA staff recommends the site plan be amended to locate this structure and the southern access route to an area outside the dynamic beach hazard. Alternatively, the Town could complete a coastal study to determine if the shoreline hazards are located appropriately.

In order to move forward with proposed development within SVCA's regulated area on the property, a SVCA permit is required, pursuant to O. Reg. 169/06. The fee for application is determined based on the complexity and size of proposed development. It is likely the fee for SVCA application will be $1735.00 to cover review of any required technical reports associated with the application. The fee for pre-consultation ($427.00) will be credited to your SVCA application fee.

Right to Hearing

Please be advised that the owner(s) of a property may submit an Application for a development or alteration proposal to the SVCA at any time. An Application must be complete as determined by the SVCA for it to be considered. The completeness of an Application is determined by SVCA staff, or an administrative review can be requested by the applicant to the SVCA's General Manager/Secretary Treasurer. In the event that the administrative review by the SVCA's General Manager/Secretary Treasurer determines an Application is not complete, the applicant can request an administrative review by the Authority.

In accordance with Section 28 (12) of the *Conservation Authorities Act*, permission required under Ontario Regulation 169/06, as amended, shall not be refused or granted subject to conditions unless the person requesting the permission has been given the opportunity for a hearing (by request) before the Authority or, in the case of the SVCA, before the Authority's Executive Committee. Should you receive an SVCA permit, approved by staff, with conditions of approval and object to one or more of the conditions, you will have the option to attend a hearing before the SVCA Executive Committee. Should you submit a complete Application for which staff is not prepared to issue a permit, you will have the option to attend a hearing scheduled before the SVCA Executive Committee.

After holding a hearing under Section 28 (12), the SVCA Executive Committee shall,

(a) refuse the permission; or
(b) grant the permission, with or without conditions

After the hearing, if the Executive Committee refuses permission, or grants permission subject to conditions, the person who requested permission shall be given written reasons for the decision. If the person is refused permission or objects to conditions imposed on the permission, the person may appeal to the Minister of Natural Resources and Forestry within 30 days of receiving the reasons for the refusal.

Planning Act Application Pre-Submission Consultation (if required)

The following pre-submission consultation comments are offered by SVCA staff in advance of any submission of a formal *Planning Act* Application required to support the application (zoning by-law amendment, minor variance, etc.). Please note, SVCA staff provide advice and recommendations to the Town regarding natural hazard and natural heritage matters; however, as you are aware, the SVCA is not the Approval Authority for *Planning Act* Applications.

Natural Hazards

As noted above, the subject property is affected by the shoreline flood hazard and dynamic beach hazard. Based on staff's review, it appears portions of the property are designated 'Environmental Hazard' in the Town of Saugeen Shores Official Plan (SSOP); and zoned 'Environmental Protection (EP)' in the Town's Zoning By-law (ZB). However, the hazard mapping in both the SSOP and ZB does not appear to reflect the hazard mapping as originally plotted by SVCA staff. It appears the food hazard for the subject property was not included in the Town's hazard mapping; and only the dynamic beach hazard was captured in the hazard designation/zoning. As such, it is SVCA staff's recommendation the Town's hazard mapping for both the SSOP and ZB be updated to reflect the hazard mapping as originally plotted by SVCA. Staff would be pleased to provide mapping for this purpose upon request.

As noted-above, a portion of the proposed banquet hall is located within the dynamic beach hazard. It is SVCA's staff's opinion, s. 3.18, Environmental Hazard policies of the SSOP does not support buildings or structures to be located within hazard lands. As such, as previously advised, it is SVCA staff's recommendation, this structure be proposed to an area outside the dynamic beach hazard. We also note; although not mapped on the Town's hazard mapping, the proposed structure also not be located within the flood hazard as originally plotted by SVCA staff. Additional information with regards to the shoreline hazards (i.e. coastal study), if reviewed, could reduce and/or refine the hazards. However, this is not a guarantee.

Natural Heritage

In the opinion of SVCA staff, the significant natural heritage features affecting the subject property are lands adjacent to Fish Habitat and potentially Habitat of Endangered Species and Threatened Species.

<u>Fish Habitat</u>

The proposed is located on lands adjacent to Fish Habitat, being Lake Huron. It is SVCA staff's opinion, s. 2.6.5 of the SSOP requires an 'Environmental Impact Statement (EIS)' where development is proposed adjacent to a water feature that contains fish habitat. It is also our understanding, as per s. 6.27.45 of the SSOP that the Town may waive the requirement for the preparation of an EIS, upon the recommendation of the SVCA, if the proposal is of such a minor nature or site conditions are such that the preparation of an EIS would serve no useful purpose for the protection of the natural heritage feature. As such, it is SVCA staff's opinion, that an EIS could be waived as development impacts can be mitigated by proper sediment and erosion control, and through the preparation of a satisfactory stormwater management plan that addresses stormwater quality.

Habitat of Endangered Species and Threatened Species

It has come to the attention of SVCA staff that habitat of endangered species and threatened species may be located on or adjacent to the property. Section 2.1.7 of the Provincial Policy Statement (PPS 2014) indicates that development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements. It is the responsibility of the applicant to ensure the endangered species and threatened species policy referred to in the PPS has been appropriately addressed. Please contact the Ministry of Environment, Conservation and Parks (MECP) for information on how to address this policy.

Please note, SVCA's staff's recommendation to waive the requirement for an EIS is based on our review of adjacent lands to fish habitat only and does not include requirements that may be legislated under the *Species at Risk Act* for addressing Habitat of Endangered Species and Threatened Species.

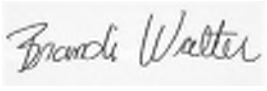
Conclusion

SVCA staff has provided comments for the proposed based on information that is currently available, and there is no guarantee these comments will remain unchanged indefinitely. A SVCA permit is required for proposed development in SVCA's regulated area as identified on the attached SVCA map. Staff recommends the site plan be amended to exclude structures and fuel tanks outside hazard lands as originally plotted by SVCA staff. We also do not recommend that an EIS be undertaken to address adjacent lands to fish habitat provided a stormwater management plan is undertaken to address stormwater quality.

Preliminary SVCA comments regarding Zoning and Official Plan matters have been included within this correspondence, but should not be considered all-encompassing for formal SVCA *Planning Act* Application comments.

Staff looks forward to meeting with you on-site, June 25, 2019 to further review this proposal. In the meantime, should you have any questions, please do not hesitate to contact our office.

Sincerely,



Brandi Walter
Environmental Planning Coordinator
Saugeen Conservation

BW\

Enclosure

cc: Cheryl Grace, Authority Member, SVCA (via email)
Mike Myatt, Authority Member, SVCA (via email)

From: Brandi Walter
To: Bruce Pinchin
Subject: RE: Port Elgin Elgin Development
Date: September 10, 2020 2:57:37 PM
Attachments: image003.jpg
image004.jpg
SVCA_Updated_100yearFloodline_Map.jpg

Dear Bruce,

Attached is a SVCA map that shows SVCA's current and updated 100 year lake levels (177.6 m) and dynamic beach hazard that affect the subject property. As you will observe, the dynamic beach in this area has been altered/interrupted over several years due to grading for public access/recreation and construction of the marina. It is the opinion of SVCA staff, the grading and alteration of these lands has caused the 100 year lake level to move inland than what is currently shown on the map as the 100 year Flood Line (blue hatched line); and therefore; the hazards associated with the Lake Huron Shoreline have moved inland.

As a result of historical alterations, the impacts of the flooding hazards / dynamic beach hazards to the proposed development, adjacent lands, and the impacts to shoreline processes from the development should be assessed. Specifically, SVCA staff are interested in the following to be reviewed, in two phases:

Phase 1:

1. An assessment of the most landward limit the Lake Huron Shoreline flooding hazard, including wave uprush (generic 15 meters from 100 year lake level), ice piling and other water related hazards at the location, including north and south of the marina for a short distance (as site alterations may have lowered elevations affecting the flood hazard on the property);
2. An assessment of the dynamic beach at this location. Given the existing and historical shoreline alterations, does a dynamic beach exist, and if so, what is the landward limit?

Phase 2:

1. Ideally, proposed development should be located outside the identified hazards, but the Town of Saugeen Shores has asked if the development could be located within the flood hazard subject to floodproofing. Therefore, what would be the impacts to natural shoreline processes from the proposed; and what would be the impacts to flood elevations on adjacent lands? Would the proposed structures be damaged from ice pilling, wave impacts, etc.?

Thank you for the opportunity to comment. If you require further discussion on the above, you can call me on my work cell at 519-369-4282.

Kind Regards,

***Please note**: As a result of COVID 19, please be aware that as March 17th, our office will be closed to the general public until further notice. Staff are still available for essential services and would be happy to help you over the phone or by email. We thank you for your cooperation and patience.*

From: Bruce Pinchin <bpinchin@shoreplan.com>
Sent: September 8, 2020 10:01 AM
To: Brandi Walter <b.walter@svca.on.ca>
Subject: Port Elgin Elgin Development

Hi Brandi,
Here is my contact info.
As discussed, please provide a PDF of your hazard mapping for this area plus the video sent to you by a local resident.
thanks

Bruce Pinchin, P. Eng.
Shoreplan Engineering Limited
20 Holly Street, Suite 202
Toronto, Ontario M4S 3B1
416-487-4756 ext 228

We are working from home during this COVID-19 pandemic. We are checking our emails frequently and will respond as soon as we can. Voicemail will be monitored. Stay healthy and stay strong.

Shoreplan Engineering Limited
20 Holly Street, Suite 202
Toronto, ON Canada M4S 3B1
T) 416.487.4756 F) 416.487.5129
E) mail@shoreplan.com

October 28, 2020

SHOREPLAN

Mr. Pier Donnini
603 Goderich St.
P.O. Box 449
Port Elgin, ON N0M 2C0

pierdonnini@bmts.com

Re: Port Elgin Beach Hazard Assessment
Our File: 20-3366

Dear Mr. Donnini:

As requested, Shoreplan Engineering Limited (Shoreplan) has completed a wave uprush and dynamic beach hazard assessment for the above noted property. Our findings, presented below, include delineation of the flood and dynamic beach hazard limits, and general comments related to floodproofing the site. It is our understanding that this report will be provided to the Saugeen Valley Conservation Authority (SVCA) in support of your application for a development permit under their Ontario Regulation 169/06.

Existing Conditions

The subject property is located south of Elgin Street and west of Harbour Street in Port Elgin, Ontario. Figure 1 is a site plan showing the subject property and a portion of the adjacent Port Elgin Harbour municipal marina. The southern portion of the site is exposed to waves propagating in from open Lake Huron while the northern portion of the site is sheltered by the marina.

The site was reviewed by a professional engineer on September 29, 2020, and the photographs presented below were taken at that time. Topographic and nearshore bathymetric surveys were completed on August 24, 2020 by a firm sub-contracted by Shoreplan. An unmanned aerial vehicle (UAV) was used to collect and deliver high-quality survey-grade topographic data for the above water portion of the study area. Ground control targets were laid out and surveyed using an RTK GPS. A UAV was then used to record high resolution aerial photographs. The captured imagery was processed using conventional photogrammetric mapping techniques to create three-dimensional point-clouds. The point-clouds were generated at a Ground Sampling Distance (GSD) of approximately 9cm, then down-sampled to a

25cm grid. A by-product of photogrammetric analysis was a set of high resolution orthorectified aerial photographs. Those photographs were used as the base for the site plan Figure 1. All elevations discussed in this report are in metres above CGVD1928.

The majority of the site is relatively flat with the western half (approximate) being used as a parking lot (Photo 1) and the eastern half being a grassed area and old asphalt pad (Photo 2). The shoreline south of the marina is a gently sloped sand beach with no natural dunes fronting the subject property (Photo 3). The marina basin walls and walkway (Photo 4) make up the shoreline for most of the property.

Two paving stone walkways extend south from the marina: one along the west edge of part of the parking lot and a longer walkway along the back of the sand beach. The area between the walkways has been landscaped with low grassed dunes (Photo 5). An accessible path that extends from the handicapped parking spot to the beach (Photo 6) represents a low area that allows wave uprush to extend onto the parking lot under design conditions.

Modifications were being made to the marina breakwater when our survey was conducted, and a temporary construction access road was protected with rip rap. That road, which is visible in Figure 1 was subsequently removed, but some rip rap has been left to protect the part of the paving stone pathway that is close to the current water line (Photo 3).

Flood Hazard Assessment

The Provincial Policy Statement (PPS) defines the limit of the flood hazard as the 100-year flood level plus a wave uprush allowance. MNR (2001) recommends calculating the wave uprush allowance using a 20-year return period storm event occurring at the 100-year instantaneous water level. MNR (1989) calculated instantaneous water levels for all Canadian shores on the Great Lakes using a combined probability analysis of monthly mean lake levels and storm surges. Table 1 shows the calculated water levels for different return periods for the shoreline sector including Port Elgin. The 100-year flood level for Port Elgin is 177.6 metres.

Table 1 MNR (1989) Design Water Levels for Port Elgin

Return Period (years)	2	5	10	25	50	100
Instantaneous Water Level (metres, GSC)	176.9	177.1	177.3	177.4	177.5	177.6
Highest Annual Monthly Level (metres, GSC)	176.66	176.95	177.10	177.25	177.35	177.43
Wind Set Up, Wind Surges (metres)	0.19	0.23	0.25	0.27	0.28	0.30

The location of the 100-year flood level contour (177.6m) is shown on the site plan Figure 1. It is noted that the 177.6m contour lies on the beach south of

the paved walkway, similar to that shown on SVCA's original flood hazard mapping, not further inland as found on SVCA's updated mapping. That updated mapping was based on contours derived from the SWOOP 2010 data produced by the province. The differences in the two mapping sets were assessed by comparing profiles plots derived from the SWOOP and site survey data sets.

Figure 2 shows profile plots for the SWOOP and UAV site survey data for a profile line on the asphalt pad in the eastern part of the site. We also show a profile line derived from point data from the survey plan you provided to us (Plan of Survey of all of Harbour Block 2 Registered Plan No. 259, Geographic Town of Port Elgin, Town of Saugeen Shores, County of Bruce, produced by Hewett and Milne Limited Ontario Land Surveyors). The UAV and Hewett and Milne OLS profile lines match very well and differ from the SWOOP profile line by as much as 25cm (approximately) at the south end of the profile line. This gives us confidence that the 100-year flood line shown on Figure 1 is reasonable and more accurate than the one shown on the updated SVCA mapping. We do acknowledge that the updated SVCA mapping was prepared for information purposes only and is not presented as an official estimate of the 100-year flood line.

Twenty-year return period wave conditions were determined for offshore directions from south-southwest through to north-northwest by performing extreme value analyses on annual maxima wave heights and periods from the U.S. Army Corps of Engineer's Lake Huron Wave Information Study (WIS) station offshore of Port Elgin. Table 2 summarizes those wave conditions.

Table 2 20-Year Return Period Deep-Water Wave Conditions

Direction	Significant Wave Height (m)	Peak Wave Period (s)
South-Southwest	2.9	9.2
Southwest	4.6	9.2
West-Southwest	5.2	10.0
West	5.8	9.7
West-Northwest	7.3	11.4
Northwest	7.2	11.8
North-Northwest	4.5	8.9

Those deep-water waves were transferred in to the site using the SWAN numerical model developed at Delft University of Technology. SWAN is an open-source, two-dimensional spectral wave model with energy generation and dissipation. Bathymetry for the model was derived from Canadian

Hydrographic Service field sheet data combined with the topographic and bathymetric survey completed for this project.

Figure 3 and Figure 4 are wave height contour and vector plots showing the transformation of the southwest and northwest waves, respectively. Each figure contains two plots with the top plot showing the transformation from deep water and the bottom plots showing wave conditions at the site in higher resolution. Note that the contour intervals differ between the top and bottom plots in each figure.

Wave uprush and overtopping analyses were completed for six cross-sections derived from the project bathymetry and topography. The locations of those cross-sections are shown on the site plan Figure 1. Wave uprush elevations and offsets were computed for each cross-section using a wave uprush program developed for composite slope profiles. That program calculates the equivalent slope uprush solution for profiles by applying different wave runup equations, depending on site conditions. For this site we considered both the Hunt wave uprush equation described in the appendices to the MNR (2001) technical guides and the design and assessment approach equation for runup on gentle slopes described in the 2018 Overtopping Manual (EurOtop, 2018).

With the composite slope procedure, the 2% exceedance uprush limit associated with the significant wave height at the outer end of the profile is calculated first. The program then calculates the uprush from progressively smaller wave heights moving landward through the surf zone. At each step an uprush solution is iterated for an equivalent straight line slope acting over the section of the profile between the break point and the limit of wave uprush. The results of the uprush analyses are dependent upon both slope and elevation (not elevation alone), which means that there is a horizontal offset that applies at a given elevation. On flat slopes the results are much more sensitive to the horizontal component of the slope than the vertical component.

The wave uprush limit is determined from the greatest landward incursion of the different uprush solutions. The wave height that produces this limiting uprush is frequently smaller than the initial wave height due to the changing slopes over the profile. A smaller wave breaking on a steeper section of slope can cause greater uprush than a larger wave breaking further offshore. Figure 5 shows an example of the uprush model output for a profile extending through the landscaped area between the two paving stone walkways. The highest nearshore wave heights along the beach are caused by the southwesterly deep-water wave, but they are not significantly higher than those coming from the northwest. The northwest wave produces slightly higher wave uprush elevations and offsets due to the higher period associated with that offshore wave.

The furthest inland incursion of wave uprush was found along the profile extending through the low area at the handicapped parking spot. The uprush elevation was calculated to be 178.65m, which is only 25cm above the 100-

year flood level, but that water propagated across almost the full width of the parking lot. The uprush width was much shorter for the higher elevation landscaped area, but water that flows inland through the low area will spill laterally into the lee of the higher area. It is not possible to accurately estimate the extent to which that lateral spilling will occur, so the flood hazard limit has to be defined by the 177.85m contour, which was the calculated uprush elevation on the profile. The actual water surface elevation north of the profile line can be expected to be lower than 177.85m, so the flooding depth will not be significant.

Figure 6 shows design wave conditions within the marina, which are produced by a northwesterly wind. Significant wave heights along the east wall of the marina are 0.35m. The wall freeboard fronting the landscaped area is 0.4m. Mean overtopping rates were calculated to be 5 l/s/m, which is a low rate, and the walkway is sloped towards the water. Water that overtops that wall will not flow as far as the parking lot and will not contribute to the flooding hazard in that area.

The wall freeboard fronting the marina buildings is 0.3m, which will produce a mean overtopping rate of 10 l/s/m. The walkway is narrower and marginally flatter there than further to the south and the buildings are considered to be within the flood hazard limit.

Some water could also reach the site from the north side of Elgin Street, where the 100-year flood level is near the edge of the road. That will be a small overtopping wave under design conditions with insufficient flow volume to alter the assumed flood hazard limit described above. The flood hazard limit is shown on the site plan Figure 1.

Dynamic Beach Assessment

The 2020 PPS defines the dynamic beach hazard as “areas of inherently unstable accumulations of shoreline sediments along the Great Lakes – St. Lawrence River System and large inland lakes, as defined by provincial standards, as amended from time to time. The dynamic beach hazard limit consists of the flooding hazard limit plus a dynamic beach allowance.” MNR (2001) defines the dynamic beach allowance as either a 30 metre default allowance or an allowance based on a study using accepted scientific and engineering principles. The dynamic beach allowance was previously called the “Defined Portion of the Dynamic Beach”. MNR (2001) notes that “Defined portions of the dynamic beach means those portions of the dynamic beach which are highly unstable and/or critical to the natural protection and maintenance of the first main dune feature and/or beach profile, where any development or site alteration would create or aggravate flooding or erosion hazards, cause updrift and/or downdrift impacts and/or cause adverse environmental impacts.”

Shoreplan frequently argues that there are “practical limits” to the dynamic beach allowance associated with existing infrastructure and land uses. We have not dealt with SVCA on this issue, but other authorities have accepted a

reduced dynamic beach allowance due to site development. Our suggestion that an existing shoreline protection wall produces a practical limit to a dynamic beach on Lake Erie was accepted in an OMB decision.

It is our opinion that public infrastructure such as the paving stone walkway along the top of the beach represents a practical limit to the dynamic beach. This is an urban site that was developed decades ago, if not a century, and there are no natural dunes or other beach features landward of the walkway. A key role of dunes is to supply sand to nearshore breaker bars during severe storm events. Sand will not be transported offshore into bars at this site. Sand on the landward side of the walkway does not play a role in the protection and maintenance of the beach profile. The dynamic beach hazard limit, defined by the walkway, is shown on the site plan Figure 1.

Development Implications

It is provincial policy, as stated in the PPS and SVCA's Environmental Planning and Regulations Policies Manual, that future development shall generally be directed to areas outside of natural hazards. However, with respect to flooding, provincial policy does allow for the possibility of development within those portions of hazardous lands where:

"….the effects and risk to public safety are minor, could be mitigated in accordance with provincial standards, and where all of the following are demonstrated and achieved:

a) development and site alteration is carried out in accordance with floodproofing standards, protection works standards, and access standards;
b) vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion, and other emergencies;
c) new hazards are not created and existing hazards are not aggravated; and
d) no adverse environmental impacts will result." (2020 PPS).

Similarly, Ontario Regulation 169/06, which is enforced by SVCA, states that the Authority may grant permission for development within the limits of the natural hazards "if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development". It is our opinion that development can be safely allowed within the flood hazard limit on the subject property, as defined in this report, if suitable floodproofing measures are applied.

The floodproofing standard does not in itself describe how floodproofing should be carried out but it does define the design water level that must be used while implementing the floodproofing. The floodproofing standard is based on the limit of wave uprush calculated under more extreme conditions than those used for the flood hazard limit calculation. MNR (2001) defines the floodproofing standard as the 100-year monthly lake level plus the 100-year storm surge plus an allowance for wave uprush from a 50 to 100-year return period wave condition. The sum of the 100-year monthly lake level

(177.43m, Table 1) and the 100-year surge level (0.30m) is 177.73m GSC; which is 0.13m higher than the 100-year flood level calculated from a combined probability analysis.

Floodproofing may be defined as structural changes and/or adjustments incorporated into the basic design and/or the construction or alteration of individual buildings, structures or properties to protect them from flood damage. MNR (2001) defines two general types of floodproofing as follows:

" dry floodproofing

- the use of fill, columns, or design modifications to elevate openings in buildings or structures above the regulatory flood level, or
- the use of water tight doors, seals, berms/floodwalls to prevent water from entering openings below the regulatory flood level.

wet floodproofing

- the use of materials, methods and design measures to maintain structural integrity and minimize water damage
- buildings or structures designed to intentionally allow flood waters to enter.

There are two basic techniques to floodproofing, defined as:

active floodproofing

- floodproofing techniques which require some action prior to any impending flood in order to make the flood protection operational, i.e. closing of water tight doors, installation of waterproof protective coverings over windows, etc.

passive floodproofing

- floodproofing techniques which are permanently in place and do not require advance warning and action in order to make the flood protection effective."

MNR (2001) states that in general, dry, passive flood protection is the most desirable approach for all types of development. For this site, constructing above the floodproofing elevation is the preferred means of achieving this and should be implemented to the fullest possible extent.

Floodproofing design is project specific as the floodproofing elevation can vary depending upon the wave uprush characteristics of the actual development. A proper floodproofing design for any new development should be carried out by a qualified professional engineer. Part of floodproofing design is to ensure safe egress exists during flooding events. Access and egress is not a concern at this site due to the limited flood depths that occur under design conditions.

The recommended means of providing dry passive floodproofing for this site is to raise the site elevation with fill. A minimum fill elevation of 177.9m will place the site above the floodproofing water level of 177.73m and will provide a buffer of 0.17m for wave uprush. That is a sufficient buffer for areas away from the beach shoreline (south of the marina), but it is insufficient for wave

uprush near the beach. The wave bore height near the property line facing the beach can be expected to be in the order of 0.5 to 0.6m. A building constructed near the property line would need to have a minimum structural openings elevation of approximately 179m if the surrounding land elevation was 177.9m. This additional buffer is required to deal with the uprush that occurs when the wave bore strikes the building foundation. Moving the building back from the property line, increasing the land elevation, or constructing low flood barrier walls would reduce the required opening elevation.

Buildings located back from the shore can have a minimum structural opening 0.3m above the surrounding grade. That 0.3m difference provides a buffer should actual conditions exceed the floodproofing design conditions specified in the MNR Technical Guides. What defines “back from the shore” is dependent on the land grade between the existing 177.73m contour and the altered site grades. For conceptual purposes a distance of 15m is reasonable, subject to confirmation of the final site grading plan.

Closing Comments

The preferred solution for floodproofing this site is to raise the site grades with fill and keep all structural openings at least 0.3m above the surrounding grade. A site grading plan and specific building floodproofing design can be developed as part of the detailed design for the development.

We trust that this report will assist in your dealings with SVCA. Please feel free to contact us if you have any comments or questions.

Yours truly,

Shoreplan Engineering Limited

Bruce Pinchin, P. Eng.

M. Sturm, P.Eng.

ec: Paola Donnini: padonnini@gmail.com

References

MNR, 1989. Great Lakes Flood Levels and Water Related Hazards. Unpublished report prepared by Conservation Authorities and Water Management Branch, Ontario Ministry of Natural Resources, February, 1989

MNR, 2001. Great Lakes - St. Lawrence River System and Large Inland Lakes. Technical Guides for flooding, erosion and dynamic beaches in support of natural hazards policies 3.1 of the provincial policy statement. Watershed Science Centre. ISBN: 0-9688196-1-3

Photo 1 Northward View of West Side of Subject Property

SHOREPLAN

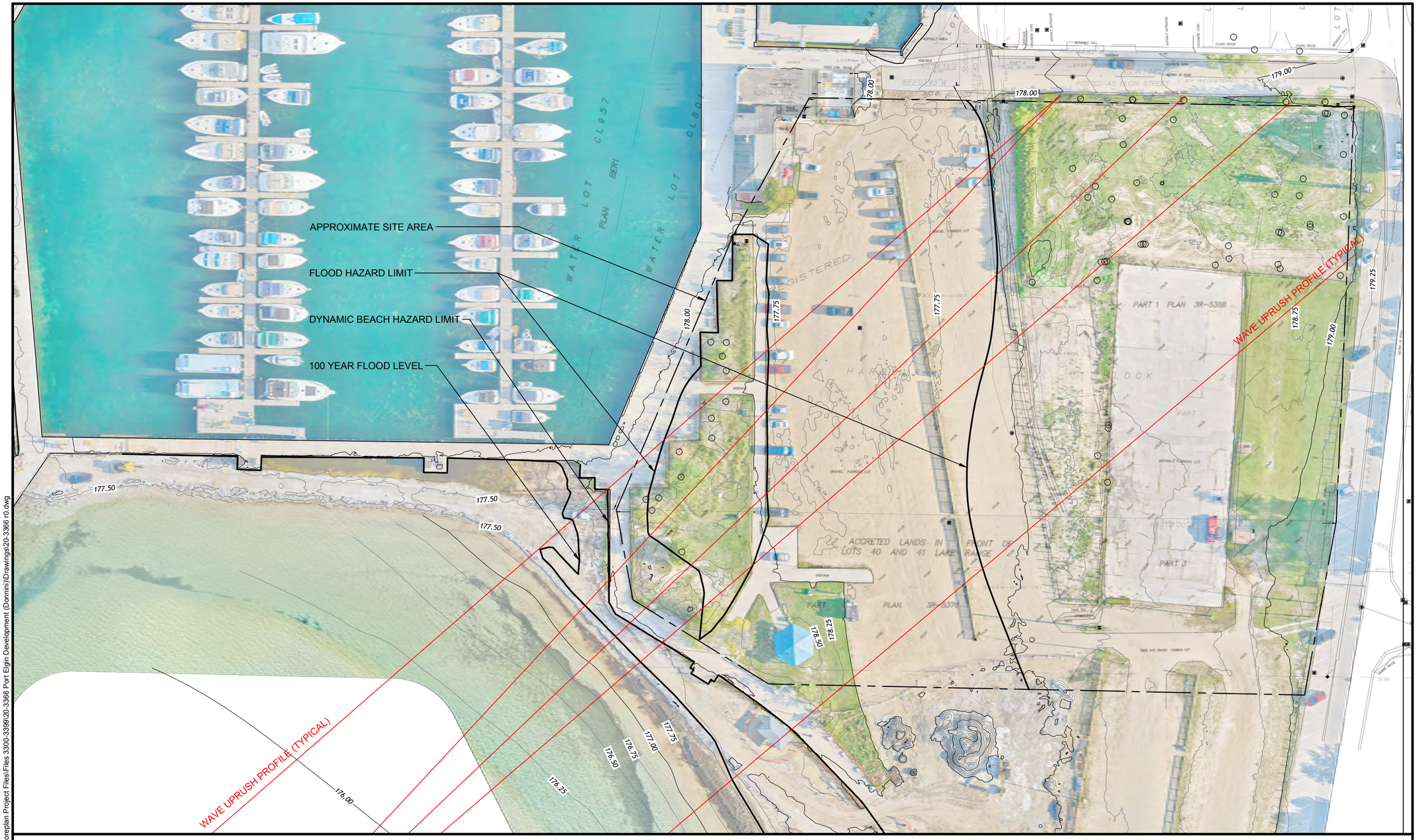
Photo 2 Southward View of East Side of Subject Property

Photo 3 Beach Shoreline

Photo 4 Marina Shoreline

Photo 5 Landscaped Area

Photo 6 Walkway Low Elevation Area



Project # 20-3366
Scale 1:750
SHOREPLAN

Figure 1
Port Elgin Development
Site Plan

Drawing Location: S:\Shoreplan Project Files\Files 3300-3399\20-3366 Port Elgin Development (Dominin)\Drawings\20-3366 r0.dwg

Figure 2 Profile Comparisons

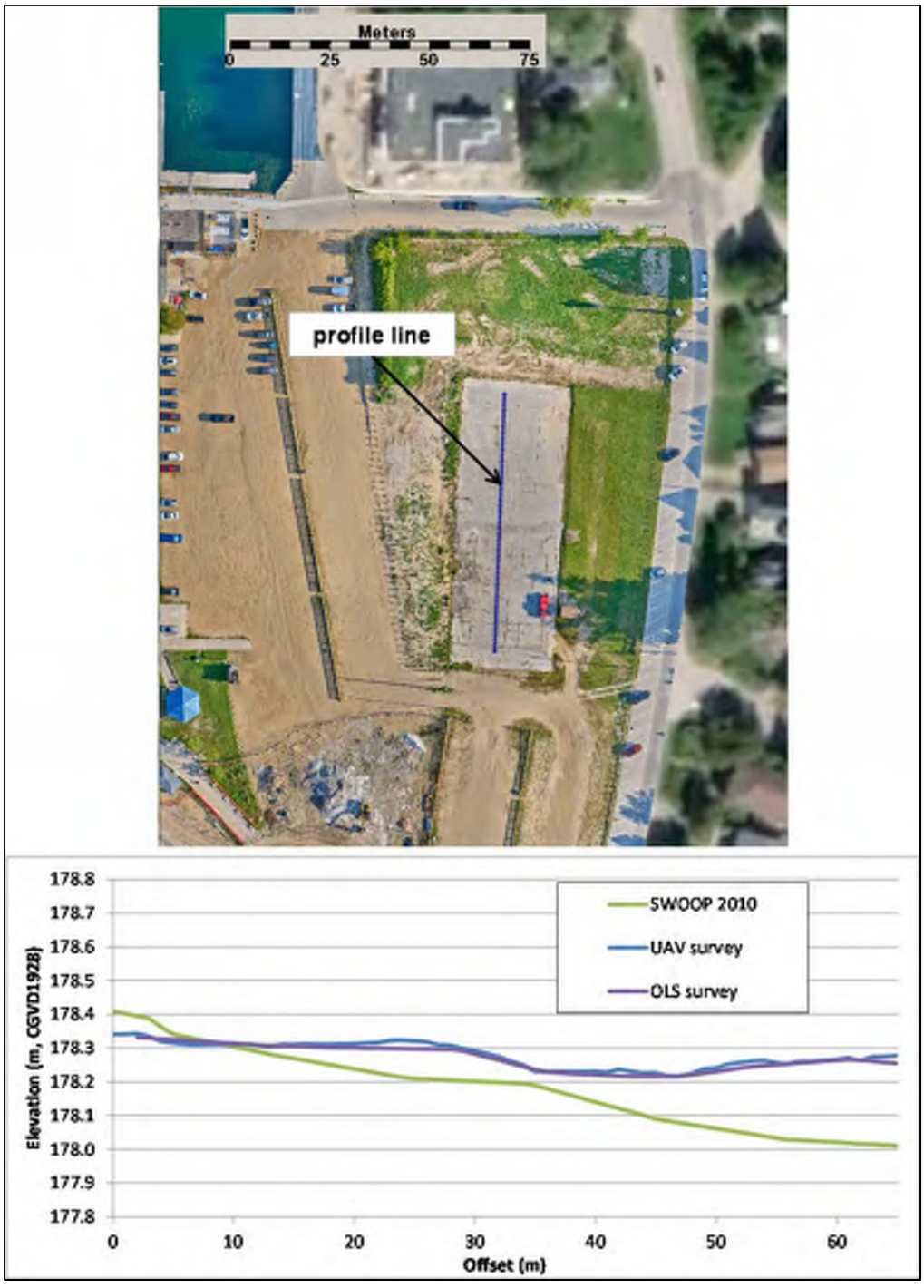
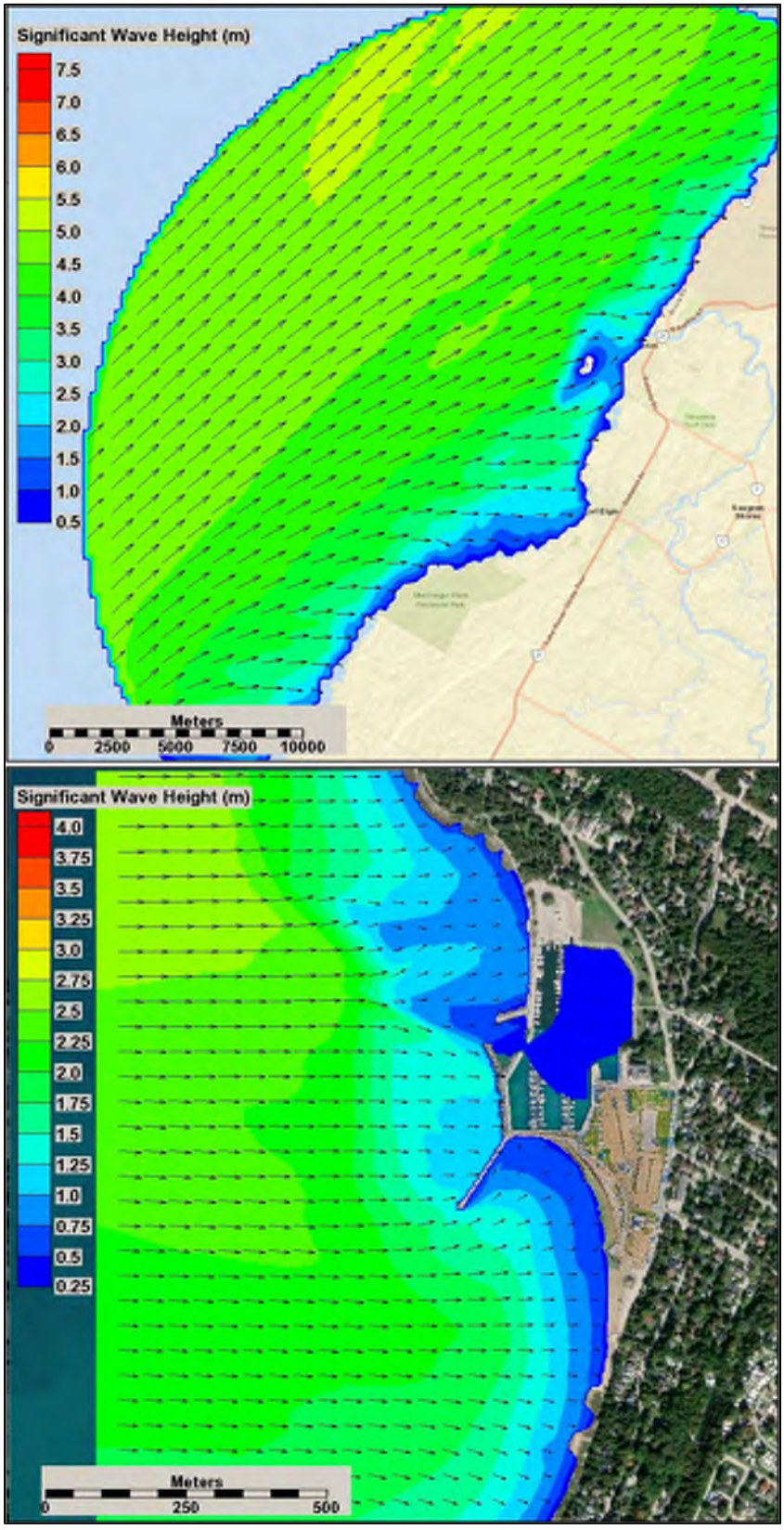
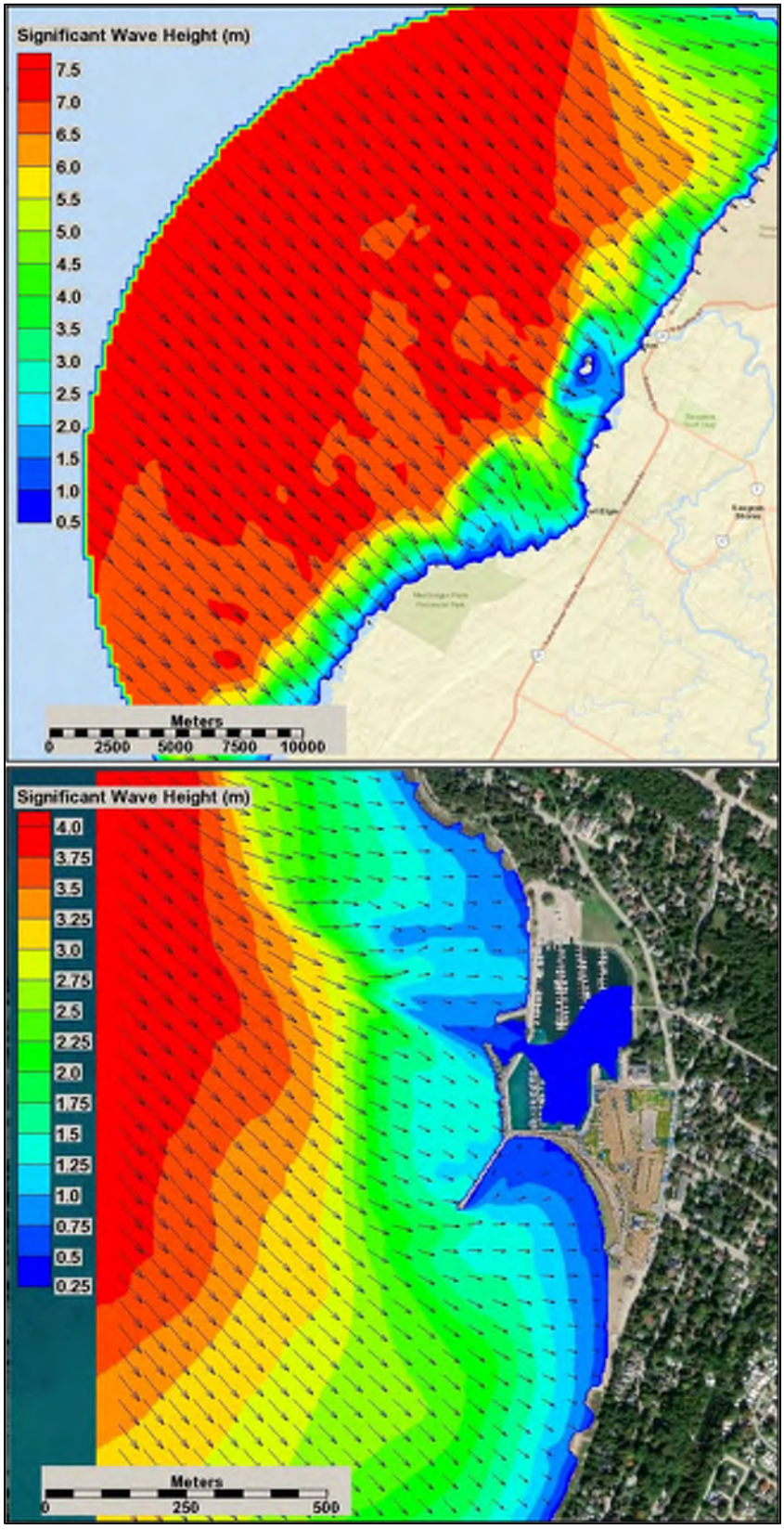


Figure 3 Transformation of 4.6m 9.2s Southwest Wave



SHOREPLAN

Figure 4 Transformation of 7.2m 11.8s Northwest Wave



SHOREPLAN

Figure 5 Example Wave Uprush Analysis Results

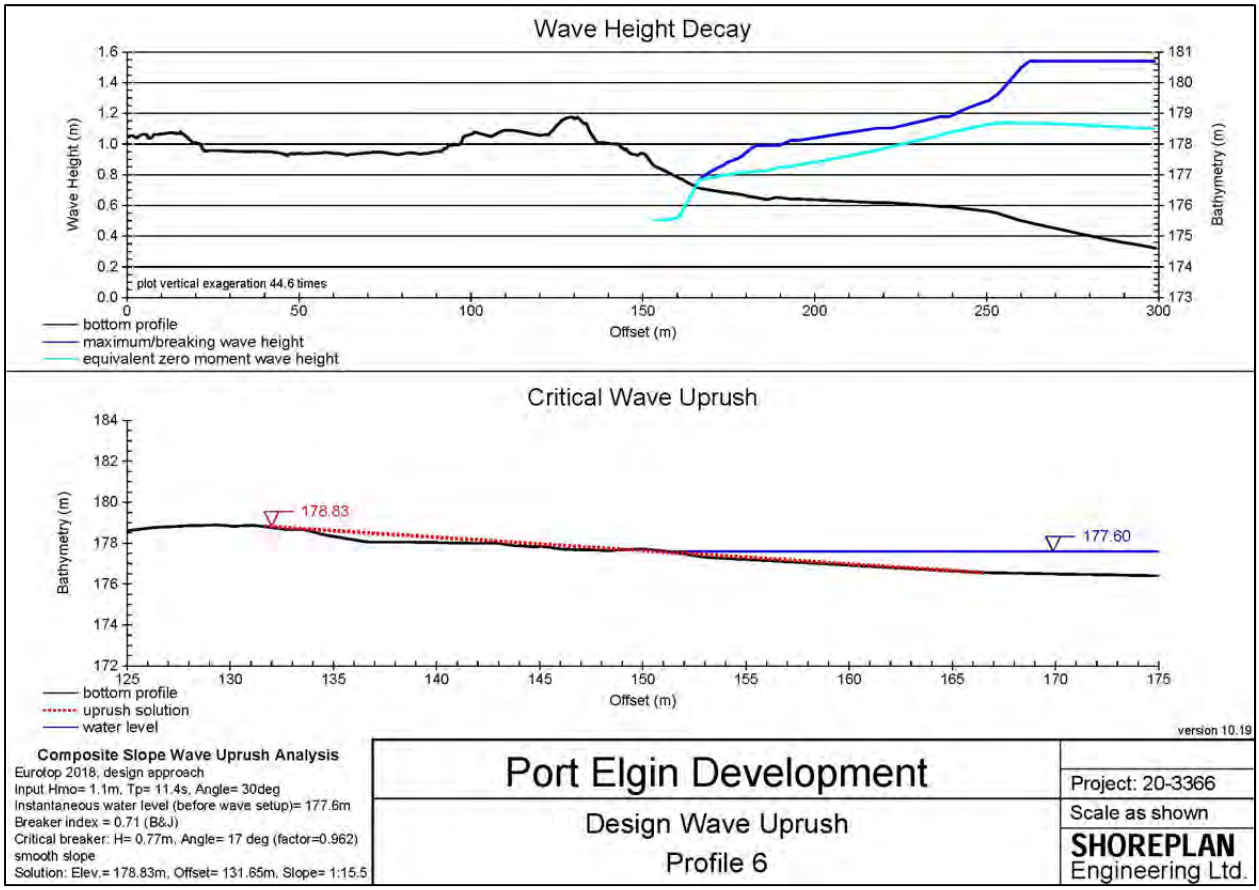
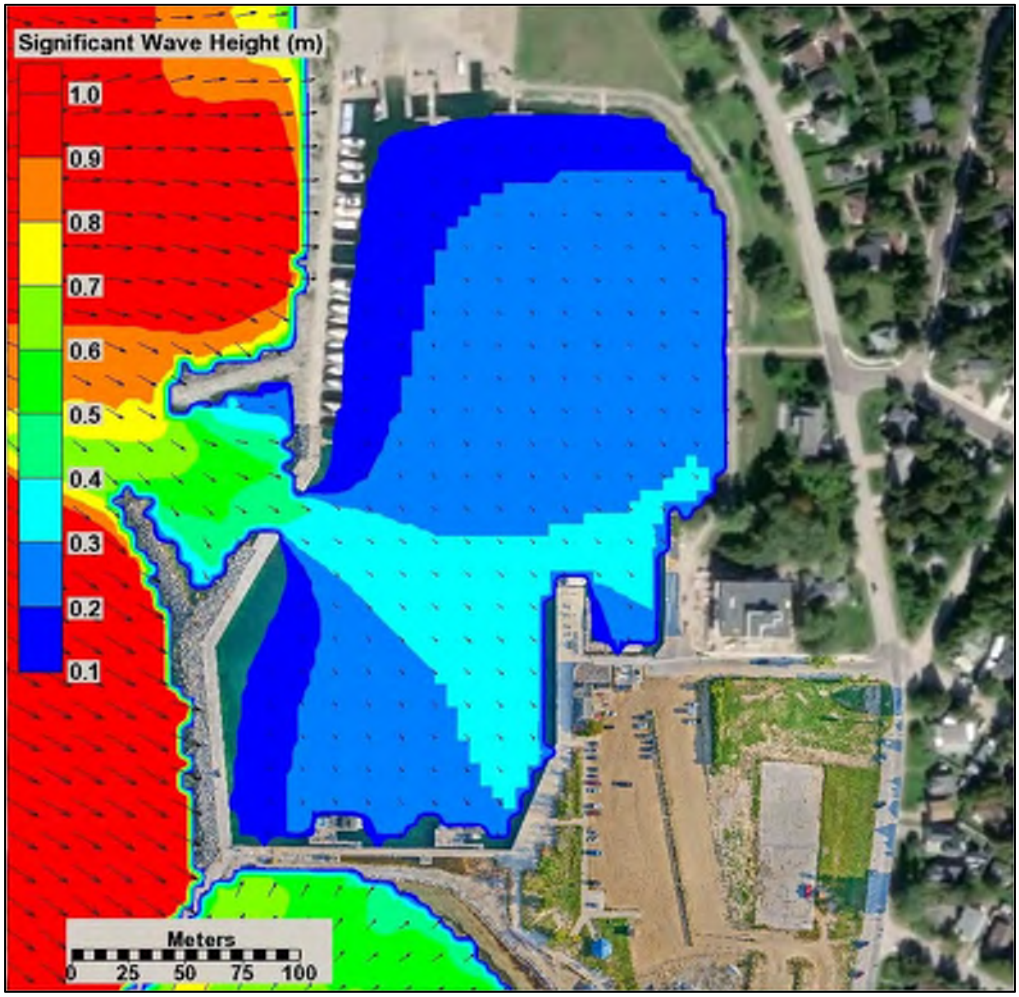


Figure 6 Design Wave Conditions Within the Marina Basin



SHOREPLAN

1078 Bruce Road 12
Box 150
Formosa, ON N0G 1W0

SAUGEEN VALLEY CONSERVATION AUTHORITY (SVCA)

APPLICATION TO ALTER A REGULATED AREA

Ontario Regulation No. 169/06, and amendments thereto,
Conservation Authorities Act, R.S.O., 1990, Chap. C.27, as amended.

Application No.

For Office Use

The SVCA will consider your proposal based upon the information that you provide in this application.
Please ensure that your proposal is clearly described and that all relevant information is included. Additional pages may be submitted as needed.

LANDOWNER INFORMATION

Name(s)	The Corporation of the Town of Saugeen Shores	Phone	(519) 832-2008
Mailing Address	600 Tomlinson Drive, P.O. Box 820	City/Town	Port Elgin, Ontario
Email	Jay Pausner <jay.pausner@saugeenshores.ca>	Postal Code	N0H 2C0

APPLICANT INFORMATION

[X] Applicant is the Landowner or one of the Landowners; or

[ ] Applicant is acting on behalf of the Landowner(s) and has submitted written authorization from the Landowner(s) to SVCA.

Applicant Name	Company Name
Email	Phone

LOCATION OF PROPOSED PROJECT

Street Address	122 Elgin Street	Municipality/Town	Town of Saugeen Shores, Port Elgin
Lot(s) and Concession(s)	Harbour Block 2	Lot and Plan No.	Registered Plan Number 259
Other Location Information		Roll No.	

PROJECT DATES

Proposed Start Date	May 1, 2021	Proposed Finish Date	June 1, 2022

COMPLETE IF CONSTRUCTION PROPOSED

Type of Project or Work Proposed	New buildings, site works and building services with landscaping, walks and terraces.		
Intended Use of Building/Structure	Event Hall, market and commercial spaces	Present Use of Building/Structure	No existing buildings
Square Footage (All Floors) of Existing	0	Square Footage (Footprint Only) of Existing	0
Square Footage (All Floors) of Proposed	5226 sq. m Incl. terraces	Square Footage (Footprint Only) of Proposed	2852 sq m incl. terraces

What is the height difference between the ground & the proposed building's lowest exterior opening (e.g. door, window, vent)?
Approximately 1 m - buildings will be constructed on raised fill; final elevation varies with existing gradients.

Basement/Cellar Proposed Yes [ ] No [X]	Crawlspace Proposed Yes [ ] No [X]	Deck/Porch Proposed Yes [X] No [ ]

Equipment to be Used (e.g. excavator, bulldozer, etc.) Excavator, bulldozer, dump trucks, concrete truck, concrete pumper truck, etc.

Any Other Relevant Information
Applicant has leased a portion of the referenced land from the Landowner who is the Town of Saugeen Shores.

COMPLETE IF FILLING, GRADING OR EXCAVATION ARE PROPOSED

Purpose of Filling/Grading/Excavation	to establish a floor and landscaping elevation above the 100-year flood hazard identified.		
Intended Use of Land When Finished	New commercial buildings, food services, event hall, outdoor terraces, outdoor recreation.		
Volume of Fill to Add to Site	To be determined	Type of Fill and Source	To be determined.
Volume of Fill to Remove from Site	Minimal - organics, only	Excess Fill or Spoil Relocated To	To be determined.

How much higher or lower will the proposed ground elevation be compared to existing? Approximately 1 m.

(See Other Side)

EROSION AND SEDIMENT CONTROL

Proposed Method(s) of Erosion and Sediment Control During and After Construction

Silt fencing designed and erected to Ontario Provincial Standard Details. Local sumps used during construction with local shoring of excavations.
Post-Construction: permanent paving and landscaping with permanent storm drainage system piped to Municipal outlet.

PLANS

A site plan must be included with your application. Check [√] each box to confirm it is on the plans:

(One copy of each plan or drawing is to be submitted. Additional copies must be provided if requested by the SVCA).

- [ ] 1. Property dimensions.
- [ ] 2. Nearest streets, roadways, laneways etc.
- [ ] 3. Watercourses on or near the property.
- [ ] 4. Existing buildings and structures and distance to lot lines, centre of road, watercourse etc.
- [ ] 5. Proposed building or structure and dimensions including decks or porches.
- [ ] 6. Proposed location of filling, area of excavation, dimensions and depths (if applicable).
- [ ] 7. Elevation of finished floor, basement/crawlspace, any windows, doors, vents, or other exterior openings in relation to finished grade
- [ ] 8. Septic bed including mantle (if applicable).
- [ ] 9. North arrow.
- [ ] 10. Other relevant site features.

drawings and land survey sent previously.

Additional plans or drawings should be included showing side views, cross-section, building foundation (if applicable) and details.

IMPORTANT INFORMATION

- No work can be carried out until a permit is issued by the SVCA and all other necessary approvals are obtained.
- A non-refundable Application Review Fee must be paid when the application is submitted to the SVCA office. Several methods of payment are accepted. Cheques may be made payable to "Saugeen Valley Conservation Authority".
- The applicant is responsible for obtaining any other agency, government or municipal approvals as may be required.
- The information obtained on this application is a public record collected under the authority of the *Conservation Authorities Act* and is accessible upon request in accordance with the *Freedom of Information and Protection of Privacy Act*.

DECLARATION

Read Carefully Before Signing

- I declare the information in this application to be true;
- I agree to allow authorized representatives of the SVCA to enter onto the property to review this application;
- I recognize and accept that the information in this application is a public record and some or all of it may be released; and
- I understand that the payment of the fee does not guarantee permission from the SVCA.

Applicant Name (Print) X _____

Applicant Signature* X _____ Date _____

** Typed name will indicate a signature on digital applications.*

DO NOT WRITE IN THIS SPACE	
Fee Amount Received	Date Application Received

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, Fax 519-367-3041, publicinfo@svca.on.ca, www.svca.on.ca

SENT BY E-MAIL ONLY (jay.pausner@saugeenshores.ca)

March 3, 2021

The Corporation of the Town of Saugeen Shores
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0

ATTENTION: Jay Pausner, Supervisor, Development Services

Dear Mr. Pausner;

RE: SVCA Application for Development: Cedar Crescent Village
122 Elgin Street
Roll No. 411046000335300
Plan 259, Harbour Block 2
Geographic Town of Port Elgin
Town of Saugeen Shores

Saugeen Valley Conservation Authority (SVCA) staff has reviewed your application for the development of a new event hall, market, and commercial spaces at the above-noted location. Your application has been reviewed with regard for Ontario Regulation 169/06 (SVCA's Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses Regulation); and in accordance with SVCA's Member approved Environmental Planning and Regulations Policies Manual, amended October 16, 2018.

SVCA staff has reviewed the following plans/reports submitted to this office in support of your application:

1. Port Elgin Beach Hazard Assessment, Shoreplan Engineering Ltd., dated October 28, 2020,
2. Plan of Survey, Hewitt and Mile Limited, OLS, dated October 2019; and,
3. Site Plan, Ground Level for Cedar Crescent Village, G.M. Diemert Architect Inc, dated October 29, 2020;

In order to assist SVCA staff's review of Shoreplan's Beach Hazard Assessment, SVCA retained the services of Peter Zuzek, Zuzek Inc. We have attached Mr. Zuzek's report for your consideration.

Based on SVCA staff's review of the above-noted reports and plans, SVCA staff cannot recommend approval of your application at this time, for the following reasons;

1. Based on Mr. Zuzek's report, there are several concerns that need to be addressed, including, but not limited to;

    a. Delineation of the 100 year flood line,

b. Delineation of the shoreline flood hazard limit,
c. Delineation of the dynamic beach hazard limit,
d. Impacts to adjacent lands from the proposed development; and,
e. The proposed development could be at risk from the shoreline hazards,

2. Portions of the development are proposed within the flooding and dynamic beach hazards of the Lake Huron Shoreline. SVCA's policies do not support new development within these shoreline hazards.
3. The proposed could create a risk to public safety and structural damage to the buildings.
4. It has not been demonstrated the proposed will not have an impact on natural shoreline processes (See attached SVCA email to Bruce Pinchin, Shoreplan Engineering, dated September 10, 2020); and,
5. It has not been demonstrated the proposed will not have an impact to the control of flooding, erosion, pollution, dynamic beaches, or the conservation of land.

In order for SVCA staff to find the application acceptable, the concerns/technical issues outlined in Mr. Zuzek's report and attached SVCA email must be addressed to Mr. Zuzek's and SVCA staff's satisfaction. Once the flooding hazard limit and dynamic beach hazard limits have been appropriately delineated, the site plan should be amended to direct all structures and access routes outside the defined hazard limits in accordance with SVCA's policies for development within the Lake Huron Shoreline hazard lands. SVCA staff can be contacted to discuss the site plan options, for example, SVCA's policies may support the maintenance of the existing parking lot for the proposed, subject to conditions. However, this would depend on the final results of the shoreline hazard assessment.

Please note, if you choose to move the proposed buildings/structures outside the flooding hazard limits, extensive floodproofing may not be required. However, for development proposed within 15 metres to the flood hazard limit, some floodproofing may still be required in accordance with recommendations of a coastal engineer.

Should you choose to continue with your application for development within the Lake Huron flooding and/or dynamic beach hazards, after these limits have been satisfactorily defined, SVCA staff would not be able to issue a permit because the proposed would not be in conformance with SVCA policies. As noted above, SVCA's policies do not support new development within the shoreline flooding and dynamic beach hazard limits. Your application would be deferred to a hearing with SVCA's Executive Committed for decision. See below for more information.

<u>Right to Hearing</u>

Please be advised that the owner(s) of a property may apply for a development or alteration proposal to the SVCA at any time. An Application must be complete as determined by the SVCA for it to be considered. The completeness of an Application is determined by SVCA staff, or an administrative review can be requested by the applicant to the SVCA's General Manager/Secretary Treasurer. In the event that the administrative review by the SVCA's General Manager/Secretary Treasurer determines an Application is not complete, the applicant can request an administrative review by the Authority.

In accordance with Section 28 (12) of the *Conservation Authorities Act*, permission required under Ontario Regulation 169/06, as amended, shall not be refused, or granted subject to conditions unless the person requesting the permission has been given the opportunity for a hearing (by request) before the Authority or, in the case of the SVCA, before the Authority's Executive Committee. Should you receive an SVCA permit,

approved by staff, with conditions of approval and object to one or more of the conditions, you will have the option to attend a hearing before the SVCA Executive Committee. Should you submit a complete Application for which staff is not prepared to issue a permit, you will have the option to attend a hearing scheduled before the SVCA Executive Committee. After holding a hearing under Section 28 (12), the SVCA Executive Committee shall,

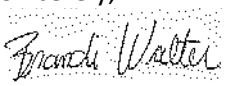
(a) refuse the permission; or
(b) grant the permission, with or without conditions

After the hearing, if the Executive Committee refuses permission, or grants permission subject to conditions, the person who requested permission shall be given written reasons for the decision. If the person is refused permission or objects to conditions imposed on the permission, the person may appeal to the Mining and Lands Tribunal within 30 days of receiving the reasons for the refusal.

We trust this information is helpful. Thank you for your cooperation in this matter. Please note, your application is on hold until SVCA staff receives an amended Shoreline Hazard Assessment to SVCA staff's satisfaction.

Should questions arise, please do not hesitate to contact this undersigned.

Sincerely,



Brandi Walter
Environmental Planning Coordinator
Saugeen Conservation

BW/

cc: Grant Diemert, Applicant's Agent (via email)
Peter Zuzek, Zuzek Inc. (via email)
Cheryl Grace, SVCA Member (via email)
Mike Myatt, SVCA Member (via email)
Jennifer Stephens, General Manager/Secretary-Treasurer, SVCA (via email)

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, Fax 519-367-3041, publicinfo@svca.on.ca, www.svca.on.ca

SENT BY E-MAIL ONLY (kara.vanmyall@saugeenshores.ca)

March 29th, 2021

The Corporation of the Town of Saugeen Shores
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0

ATTENTION: Kara Van Myall, Chief Administrative Officer

Dear Ms. Van Myall;

RE: SVCA Application for Development: Cedar Crescent Village
122 Elgin Street
Roll No. 411046000335300
Plan 259, Harbour Block 2
Geographic Town of Port Elgin
Town of Saugeen Shores

Thank you for taking the time to meet virtually with Saugeen Valley Conservation Authority (SVCA) staff on March 11, 2021 to discuss the proposed Cedar Crescent Village (CCV) application at 122 Elgin Street, Town of Port Elgin, Town of Saugeen Shores. It is SVCA staff's opinion, the meeting was productive, and we hope the following summary satisfies your request for clarification of the letter sent by SVCA on March 3rd, 2021 (attached).

1. Saugeen Valley Conservation Authority retained the support of Peter Zuzek to review the technical material submitted By Shoreplan Inc. (October 28, 2020) to support this application. At the meeting held on March 11th, 2021, Mr. Zuzek explained some of the recommendations provided to SVCA in his February 25, 2021 report. To make a more informed decision regarding the CCV application and compliance with the *Conservation Authorities Act* and Regulation 169/06, SVCA staff recommend the following:

    a. **Flood Hazard Assessment**
        i. The last 32 years of measured water levels on Lake Huron should be reviewed to confirm the 100-year flood level at the site. To ascertain the importance of this data, the use of stream gauge information at Goderich and Tobermory can be accessed to see how levels have changed between 1988 and recent years.

        ii. Topographic data used to establish beach transects should be re-evaluated for accurate wave runup calculations and to accurately locate the 100-year flood level on site.

iii. Conclusions pertaining to wave runup evaluation/flood hazard limit are inconsistent within the Shoreplan Inc. report. Three different runup elevations were presented. It is our understanding that the proposed floodproofing elevation is 177.65. If so, please amend the report appropriately.

b. **Dynamic Beach Hazard Assessment:**
   i. The Shoreplan Inc. report did not provide any scientific or engineering justification to substantiate eliminating the 30 m dynamic beach allowance. It is our recommendation that this decision be demonstrated appropriately.

c. **Impacts to Property/Public Safety Concerns:**
   i. As noted in Mr. Zuzek's report, calculated wave overtopping rates of 5 to 10 l/s/m may be high enough to be dangerous to pedestrians and vehicles. Further, these heights may result in structural damage to buildings located near the shoreline or marina walls. It would be helpful if Shoreplan Inc. were to explain what measures are in place or are expected to be in place to protect people and property because of this new development.

d. **Adjacent Land Impacts/Impacts to flooding and erosion:**
   i. On September 10, 2020, SVCA staff requested that the impacts to adjacent lands be assessed from development proposed within the flooding hazard limit. The Authority is particularly concerned about whether there will be increased flooding and erosion to adjacent lands. In addition, the Authority's interests also extend to whether natural shoreline processes will be impeded. In additional information provided back to the Authority for our review, it is necessary that the Town of Saugeen Shores include this information in their response.

2. Final site plan, grading plan and construction drawings/plans.

It is SVCA's understanding that the Town of Saugeen Shores wishes to have shovels in the ground for this development project in early June. To help move both parties towards this timeline, there are a few matters to consider.

1) Items 1a. through d. can be addressed through a revised Beach Hazard Assessment and/or addendum. If it would be easier to produce multiple addenda, SVCA has no problem with this approach. Once materials are received, they will be reviewed accordingly.

2) As outlined in letters sent to the Town of Saugeen Shores on June 19th, 2019 and March 3rd, 2021, SVCA's Environmental Planning and Regulations Policies do not support new development within the flooding hazard and dynamic beach limits. However, in the June 19th, 2019 correspondence, it was communicated that SVCA's Shoreline Policies do support some development within these hazards provided it has been demonstrated that the control of flooding, erosion, pollution, dynamic beaches, and the conservation of land will not be negatively affected. SVCA staff would find it acceptable if the CCV site plan were amended to locate proposed structures east of the flooding and dynamic beach hazard limits (potentially revised) and the existing parking area and access roads were maintained at the same general grades. Infrastructure such as sewers and waterlines would also be permitted. If the dynamic beach limit is not amended from its current position, a coastal engineer would need to assess the impact of hardening the surface from beach sand to concrete or asphalt should that be the proposed option being pursued.

SVCA has established policies and procedures to ensure that permit applicants can appeal beyond staff should they disagree with the recommendations put forward by staff. At this point, SVCA staff confirm that there is insufficient information necessary to make an informed decision under the *Conservation Authorities Act* and Ontario Regulation 169/06 regarding the CCV application. To complete the CCV application, it is recommended that the concerns noted above, as well as a complete set of engineering drawings be submitted to SVCA for review.

If this information cannot be submitted and the Town of Saugeen Shores wishes a decision to be made by SVCA independent of this material or if SVCA staff cannot approve a permit, a Hearing may be requested by the Town. This Hearing will allow the Town of Saugeen Shores to present to the Executive Committee of SVCA's Board of Directors for a decision about their proposal. It is anticipated that this Hearing would be held the week of May 3rd, 2021. The exact date will be confirmed on Monday, April 5th, 2021.

We trust the above information clarifies our needs to move the CCV application forward. It is SVCA's desire to support municipalities in their efforts to grow in a safe and sustainable way that protects our environment and their residents. Please feel free to reach out to me should I be able to provide you with any further assistance.

Sincerely,

Jennifer Stephens
General Manager/Secretary-Treasurer
Saugeen Valley Conservation Authority

JS/

Encl. Letter – Sent March 3, 2021 from B. Walter, SVCA to J. Pausner, Town of Saugeen Shores regarding SVCA Application for Development: Cedar Crescent Village, 122 Elgin Street, Plan 259, Harbour Block 2, Town of Port Elgin, Town of Saugeen Shores
Electronic Correspondence – Sent September 10, 2020 from B. Walter, SVCA to B. Pinchin, Shoreplan Engineering Limited regarding Port Elgin Development
Letter – Sent June 19, 2019 from B. Walter, SVCA to J. Pausner, Town of Saugeen Shores regarding Pre-Consultation: Proposed Port Elgin Beach Development, Plan 259, Harbour Block 2, Town of Port Elgin, Town of Saugeen Shores

cc: Grant Diemert, Applicant's Agent (via email)
Peter Zuzek, Zuzek Inc. (via email)
Cheryl Grace, Director, SVCA (via email)
Mike Myatt, Director, SVCA (via email)
Brandi Walter, Coordinator, Environment Planning, SVCA (via email)
Erik Downing, Manager, Environmental Planning and Regulations, SVCA (via email)

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, Fax 519-367-3041, publicinfo@svca.on.ca, www.svca.on.ca

SENT BY E-MAIL ONLY (jay.pausner@saugeenshores.ca)

March 3, 2021

The Corporation of the Town of Saugeen Shores
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0

ATTENTION: Jay Pausner, Supervisor, Development Services

Dear Mr. Pausner;

RE: SVCA Application for Development: Cedar Crescent Village
122 Elgin Street
Roll No. 411046000335300
Plan 259, Harbour Block 2
Geographic Town of Port Elgin
Town of Saugeen Shores

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3. Site Plan, Ground Level for Cedar Crescent Village, G.M. Diemert Architect Inc, dated October 29, 2020;

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Based on SVCA staff's review of the above-noted reports and plans, SVCA staff cannot recommend approval of your application at this time, for the following reasons;

1. Based on Mr. Zuzek's report, there are several concerns that need to be addressed, including, but not limited to;

    a. Delineation of the 100 year flood line,

b. Delineation of the shoreline flood hazard limit,
c. Delineation of the dynamic beach hazard limit,
d. Impacts to adjacent lands from the proposed development; and,
e. The proposed development could be at risk from the shoreline hazards,

2. Portions of the development are proposed within the flooding and dynamic beach hazards of the Lake Huron Shoreline. SVCA's policies do not support new development within these shoreline hazards.
3. The proposed could create a risk to public safety and structural damage to the buildings.
4. It has not been demonstrated the proposed will not have an impact on natural shoreline processes (See attached SVCA email to Bruce Pinchin, Shoreplan Engineering, dated September 10, 2020); and,
5. It has not been demonstrated the proposed will not have an impact to the control of flooding, erosion, pollution, dynamic beaches, or the conservation of land.

In order for SVCA staff to find the application acceptable, the concerns/technical issues outlined in Mr. Zuzek's report and attached SVCA email must be addressed to Mr. Zuzek's and SVCA staff's satisfaction. Once the flooding hazard limit and dynamic beach hazard limits have been appropriately delineated, the site plan should be amended to direct all structures and access routes outside the defined hazard limits in accordance with SVCA's policies for development within the Lake Huron Shoreline hazard lands. SVCA staff can be contacted to discuss the site plan options, for example, SVCA's policies may support the maintenance of the existing parking lot for the proposed, subject to conditions. However, this would depend on the final results of the shoreline hazard assessment.

Please note, if you choose to move the proposed buildings/structures outside the flooding hazard limits, extensive floodproofing may not be required. However, for development proposed within 15 metres to the flood hazard limit, some floodproofing may still be required in accordance with recommendations of a coastal engineer.

Should you choose to continue with your application for development within the Lake Huron flooding and/or dynamic beach hazards, after these limits have been satisfactorily defined, SVCA staff would not be able to issue a permit because the proposed would not be in conformance with SVCA policies. As noted above, SVCA's policies do not support new development within the shoreline flooding and dynamic beach hazard limits. Your application would be deferred to a hearing with SVCA's Executive Committed for decision. See below for more information.

<u>Right to Hearing</u>

Please be advised that the owner(s) of a property may apply for a development or alteration proposal to the SVCA at any time. An Application must be complete as determined by the SVCA for it to be considered. The completeness of an Application is determined by SVCA staff, or an administrative review can be requested by the applicant to the SVCA's General Manager/Secretary Treasurer. In the event that the administrative review by the SVCA's General Manager/Secretary Treasurer determines an Application is not complete, the applicant can request an administrative review by the Authority.

In accordance with Section 28 (12) of the *Conservation Authorities Act*, permission required under Ontario Regulation 169/06, as amended, shall not be refused, or granted subject to conditions unless the person requesting the permission has been given the opportunity for a hearing (by request) before the Authority or, in the case of the SVCA, before the Authority's Executive Committee. Should you receive an SVCA permit,

approved by staff, with conditions of approval and object to one or more of the conditions, you will have the option to attend a hearing before the SVCA Executive Committee. Should you submit a complete Application for which staff is not prepared to issue a permit, you will have the option to attend a hearing scheduled before the SVCA Executive Committee. After holding a hearing under Section 28 (12), the SVCA Executive Committee shall,

(a) refuse the permission; or
(b) grant the permission, with or without conditions

After the hearing, if the Executive Committee refuses permission, or grants permission subject to conditions, the person who requested permission shall be given written reasons for the decision. If the person is refused permission or objects to conditions imposed on the permission, the person may appeal to the Mining and Lands Tribunal within 30 days of receiving the reasons for the refusal.

We trust this information is helpful. Thank you for your cooperation in this matter. Please note, your application is on hold until SVCA staff receives an amended Shoreline Hazard Assessment to SVCA staff's satisfaction.

Should questions arise, please do not hesitate to contact this undersigned.

Sincerely,

Brandi Walter
Environmental Planning Coordinator
Saugeen Conservation

BW/

cc: Grant Diemert, Applicant's Agent (via email)
Peter Zuzek, Zuzek Inc. (via email)
Cheryl Grace, SVCA Member (via email)
Mike Myatt, SVCA Member (via email)
Jennifer Stephens, General Manager/Secretary-Treasurer, SVCA (via email)

From:	Brandi Walter
To:	Bruce Pinchin
Subject:	RE: Port Elgin Elgin Development
Date:	September 10, 2020 2:57:00 PM
Attachments:	SVCA_Updated_100yearFloodline_Map.jpg image003.jpg image004.jpg

---

Dear Bruce,

Attached is a SVCA map that shows SVCA's current and updated 100 year lake levels (177.6 m) and dynamic beach hazard that affect the subject property. As you will observe, the dynamic beach in this area has been altered/interrupted over several years due to grading for public access/recreation and construction of the marina. It is the opinion of SVCA staff, the grading and alteration of these lands has caused the 100 year lake level to move inland than what is currently shown on the map as the 100 year Flood Line (blue hatched line); and therefore; the hazards associated with the Lake Huron Shoreline have moved inland.

As a result of historical alterations, the impacts of the flooding hazards / dynamic beach hazards to the proposed development, adjacent lands, and the impacts to shoreline processes from the development should be assessed. Specifically, SVCA staff are interested in the following to be reviewed, in two phases:

Phase 1:

1. An assessment of the most landward limit the Lake Huron Shoreline flooding hazard, including wave uprush (generic 15 meters from 100 year lake level), ice piling and other water related hazards at the location, including north and south of the marina for a short distance (as site alterations may have lowered elevations affecting the flood hazard on the property);
2. An assessment of the dynamic beach at this location. Given the existing and historical shoreline alterations, does a dynamic beach exist, and if so, what is the landward limit?

Phase 2:

1. Ideally, proposed development should be located outside the identified hazards, but the Town of Saugeen Shores has asked if the development could be located within the flood hazard subject to floodproofing. Therefore, what would be the impacts to natural shoreline processes from the proposed; and what would be the impacts to flood elevations on adjacent lands? Would the proposed structures be damaged from ice pilling, wave impacts, etc.?

Thank you for the opportunity to comment. If you require further discussion on the above, you can call me on my work cell at 519-369-4282.

Kind Regards,

***Please note**: As a result of COVID 19, please be aware that as March 17th, our office will be closed to the general public until further notice. Staff are still available for essential services and would be happy to help you over the phone or by email. We thank you for your cooperation and patience.*

From: Bruce Pinchin <bpinchin@shoreplan.com>
Sent: September 8, 2020 10:01 AM
To: Brandi Walter <b.walter@svca.on.ca>
Subject: Port Elgin Elgin Development

Hi Brandi,
Here is my contact info.
As discussed, please provide a PDF of your hazard mapping for this area plus the video sent to you by a local resident.
thanks

Bruce Pinchin, P. Eng.
Shoreplan Engineering Limited
20 Holly Street, Suite 202
Toronto, Ontario M4S 3B1
416-487-4756 ext 228

We are working from home during this COVID-19 pandemic. We are checking our emails frequently and will respond as soon as we can. Voicemail will be monitored. Stay healthy and stay strong.

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, Fax 519-367-3041, publicinfo@svca.on.ca, www.svca.on.ca

June 19, 2019

Town of Saugeen Shores
600 Tomlinson Drive
Port Elgin, ON N0H 2C0

Attention: Jay Pausner, Supervisor, Development Services

Dear Mr. Pausner:

Re: SVCA Pre-Consultation - Proposed Port Elgin Beach Development
Roll No. 411046000335300
Plan 259, Harbour, Part BLK 2
Geographic Town of Port Elgin
Town of Saugeen Shores

It is the understanding of Saugeen Valley Conservation Authority (SVCA) staff that the Town of Saugeen Shores is interested in developing the above-noted property and you have asked staff to provide preliminary comments on the attached site plan. The regulatory comments provided in this correspondence are in accordance with the SVCA's mandate, the SVCA Environmental Planning and Regulations Policies Manual, amended October 16, 2018; and the pre-submission consultation comments regarding *Planning Act* matters, are in accordance with the Memorandum of Agreement between the Authority and the County of Bruce relating to Plan Review.

Based on our review of the site plan, SVCA mapping and the aforementioned policies, SVCA finds the proposed generally acceptable; provided the site plan is amended to accommodate the hazard lands affecting the property. Please see below for further comments.

SVCA Regulation

Portions of the property are subject to the SVCA's Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 169/06, as amended). This Regulation is in accordance with Section 28 of the *Conservation Authorities Act* R.S.O, 1990, Chap. C. 27, and requires that a person obtain the written permission of the SVCA prior to any "development" within a Regulated Area or alteration to a wetland or watercourse.

"Development" and Alteration

Subsection 28(25) of the *Conservation Authorities Act* defines "development" as:

a) the construction, reconstruction, erection or placing of a building or structure of any kind,

b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure,
c) site grading, or
d) the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere.

And;

According to Section 5 of Ontario Regulation 169/06, as amended, alteration includes the straightening, diverting, or interference in any way with the existing channel of a river, creek, stream or watercourse, or the changing or interfering in any way with a wetland.

To determine where the SVCA's area of interest is located associated with our Regulation on the property, please refer to the SVCA's online mapping program, available via the SVCA's website at http://eprweb.svca.on.ca. Should you require assistance, please contact our office directly.

We have also attached a map for ease of reference, which illustrates the proposed development in relation to SVCA's regulated area. The SVCA regulated features affecting the subject property are the dynamic beach hazard and the Lake Huron shoreline flood hazard (Lake Huron floodline plus 15 metres wave uprush) plus a 15 metre allowance adjacent to the flood hazard.

SVCA Permission for Development

Based on staff's review of the proposed site plan, it appears the following works are proposed within the SVCA's Regulated Area:

- Service entrance off Elgin Street and an access road at the south limit of the property;
- Structures (retail building, boaters station, sunset tower, and banquet hall;
- Potentially new fuel tanks (it is not clear on the plan if these are existing or proposed); and,
- Grading and site alteration associated with the above.

Shoreline Flood Hazard:

In general, no new development is permitted within the shoreline flood hazard and dynamic beach hazard; with the exception of the Elgin Street access, which may be permitted, provided it can be demonstrated to SVCA that the control of flooding, erosion, pollution, or the conservation of land is not negatively affected. It is likely SVCA conditions for construction of the access would include a satisfactory lot grading and erosion control plan that addresses the above tests. Proposed development for the installation of fuel tanks within the flood hazard is not supported by SVCA's policies for development within flood hazards. As such, it is recommended the site plan be amended to show proposed fuel tanks outside the flood hazard.

15 Metres Adjacent to the Flood Hazard:

Development and site alteration for the construction of new buildings and associated site grading proposed within 15 metres to the flood hazard is generally permitted provided it can be demonstrated

to SVCA that the control of flooding, erosion, pollution, or the conservation of land is not negatively affected. This condition must be demonstrated in satisfactory lot grading and erosion control plans.

Dynamic Beach Hazard:

As shown on the attached map, it appears a large portion of the proposed restaurant/banquet hall and southern access road are largely located within the dynamic beach hazard as shown on the attached map. Unfortunately, SVCA's policies for development within the dynamic beach hazard do not support new development within the dynamic beach hazard limit. As such, SVCA staff recommends the site plan be amended to locate this structure and the southern access route to an area outside the dynamic beach hazard. Alternatively, the Town could complete a coastal study to determine if the shoreline hazards are located appropriately.

In order to move forward with proposed development within SVCA's regulated area on the property, a SVCA permit is required, pursuant to O. Reg. 169/06. The fee for application is determined based on the complexity and size of proposed development. It is likely the fee for SVCA application will be $1735.00 to cover review of any required technical reports associated with the application. The fee for pre-consultation ($427.00) will be credited to your SVCA application fee.

Right to Hearing

Please be advised that the owner(s) of a property may submit an Application for a development or alteration proposal to the SVCA at any time. An Application must be complete as determined by the SVCA for it to be considered. The completeness of an Application is determined by SVCA staff, or an administrative review can be requested by the applicant to the SVCA's General Manager/Secretary Treasurer. In the event that the administrative review by the SVCA's General Manager/Secretary Treasurer determines an Application is not complete, the applicant can request an administrative review by the Authority.

In accordance with Section 28 (12) of the *Conservation Authorities Act*, permission required under Ontario Regulation 169/06, as amended, shall not be refused or granted subject to conditions unless the person requesting the permission has been given the opportunity for a hearing (by request) before the Authority or, in the case of the SVCA, before the Authority's Executive Committee. Should you receive an SVCA permit, approved by staff, with conditions of approval and object to one or more of the conditions, you will have the option to attend a hearing before the SVCA Executive Committee. Should you submit a complete Application for which staff is not prepared to issue a permit, you will have the option to attend a hearing scheduled before the SVCA Executive Committee.

After holding a hearing under Section 28 (12), the SVCA Executive Committee shall,

(a) refuse the permission; or
(b) grant the permission, with or without conditions

After the hearing, if the Executive Committee refuses permission, or grants permission subject to conditions, the person who requested permission shall be given written reasons for the decision. If the person is refused permission or objects to conditions imposed on the permission, the person may appeal to the Minister of Natural Resources and Forestry within 30 days of receiving the reasons for the refusal.

Planning Act Application Pre-Submission Consultation (if required)

The following pre-submission consultation comments are offered by SVCA staff in advance of any submission of a formal *Planning Act* Application required to support the application (zoning by-law amendment, minor variance, etc.). Please note, SVCA staff provide advice and recommendations to the Town regarding natural hazard and natural heritage matters; however, as you are aware, the SVCA is not the Approval Authority for *Planning Act* Applications.

Natural Hazards

As noted above, the subject property is affected by the shoreline flood hazard and dynamic beach hazard. Based on staff's review, it appears portions of the property are designated 'Environmental Hazard' in the Town of Saugeen Shores Official Plan (SSOP); and zoned 'Environmental Protection (EP)' in the Town's Zoning By-law (ZB). However, the hazard mapping in both the SSOP and ZB does not appear to reflect the hazard mapping as originally plotted by SVCA staff. It appears the food hazard for the subject property was not included in the Town's hazard mapping; and only the dynamic beach hazard was captured in the hazard designation/zoning. As such, it is SVCA staff's recommendation the Town's hazard mapping for both the SSOP and ZB be updated to reflect the hazard mapping as originally plotted by SVCA. Staff would be pleased to provide mapping for this purpose upon request.

As noted-above, a portion of the proposed banquet hall is located within the dynamic beach hazard. It is SVCA's staff's opinion, s. 3.18, Environmental Hazard policies of the SSOP does not support buildings or structures to be located within hazard lands. As such, as previously advised, it is SVCA staff's recommendation, this structure be proposed to an area outside the dynamic beach hazard. We also note; although not mapped on the Town's hazard mapping, the proposed structure also not be located within the flood hazard as originally plotted by SVCA staff. Additional information with regards to the shoreline hazards (i.e. coastal study), if reviewed, could reduce and/or refine the hazards. However, this is not a guarantee.

Natural Heritage

In the opinion of SVCA staff, the significant natural heritage features affecting the subject property are lands adjacent to Fish Habitat and potentially Habitat of Endangered Species and Threatened Species.

<u>Fish Habitat</u>

The proposed is located on lands adjacent to Fish Habitat, being Lake Huron. It is SVCA staff's opinion, s. 2.6.5 of the SSOP requires an 'Environmental Impact Statement (EIS)' where development is proposed adjacent to a water feature that contains fish habitat. It is also our understanding, as per s. 6.27.45 of the SSOP that the Town may waive the requirement for the preparation of an EIS, upon the recommendation of the SVCA, if the proposal is of such a minor nature or site conditions are such that the preparation of an EIS would serve no useful purpose for the protection of the natural heritage feature. As such, it is SVCA staff's opinion, that an EIS could be waived as development impacts can be mitigated by proper sediment and erosion control, and through the preparation of a satisfactory stormwater management plan that addresses stormwater quality.

Habitat of Endangered Species and Threatened Species

It has come to the attention of SVCA staff that habitat of endangered species and threatened species may be located on or adjacent to the property. Section 2.1.7 of the Provincial Policy Statement (PPS 2014) indicates that development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements. It is the responsibility of the applicant to ensure the endangered species and threatened species policy referred to in the PPS has been appropriately addressed. Please contact the Ministry of Environment, Conservation and Parks (MECP) for information on how to address this policy.

Please note, SVCA's staff's recommendation to waive the requirement for an EIS is based on our review of adjacent lands to fish habitat only and does not include requirements that may be legislated under the *Species at Risk Act* for addressing Habitat of Endangered Species and Threatened Species.

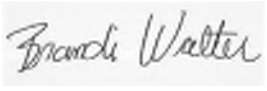
Conclusion

SVCA staff has provided comments for the proposed based on information that is currently available, and there is no guarantee these comments will remain unchanged indefinitely. A SVCA permit is required for proposed development in SVCA's regulated area as identified on the attached SVCA map. Staff recommends the site plan be amended to exclude structures and fuel tanks outside hazard lands as originally plotted by SVCA staff. We also do not recommend that an EIS be undertaken to address adjacent lands to fish habitat provided a stormwater management plan is undertaken to address stormwater quality.

Preliminary SVCA comments regarding Zoning and Official Plan matters have been included within this correspondence, but should not be considered all-encompassing for formal SVCA *Planning Act* Application comments.

Staff looks forward to meeting with you on-site, June 25, 2019 to further review this proposal. In the meantime, should you have any questions, please do not hesitate to contact our office.

Sincerely,



Brandi Walter
Environmental Planning Coordinator
Saugeen Conservation

BW\

Enclosure

cc: Cheryl Grace, Authority Member, SVCA (via email)
Mike Myatt, Authority Member, SVCA (via email)

Shoreplan Engineering Limited
20 Holly Street, Suite 202
Toronto, ON Canada M4S 3B1
T) 416.487.4756 F) 416.487.5129
E) mail@shoreplan.com

April 19, 2021

Ms. Amanda Froese, P. Eng.
Director, Infrastructures and Development Services
Town of Saugeen Shores
600 Tomlinson Drive
Port Elgin, ON, N0H 2C0

Re: Cedar Crescent Village Follow-up
Our File: 20-3366

Dear Ms. Froese:

This letter has been prepared in response to the March 29, 2021 letter from Saugeen Conservation to Kara van Myall. That letter provided clarification to SVCA's original response to our October 28, 2020 Port Elgin Beach Hazard Assessment for the Cedar Crescent Village site. We have included SVCA's March 29th comments below to provide context for our replies.

SVCA Comments

SVCA 1. a. i. The last 32 years of measured water levels on Lake Huron should be reviewed to confirm the 100-year flood level at the site. To ascertain the importance of this data, the use of stream gauge information at Goderich and Tobermory can be accessed to see how levels have changed between 1988 and recent years.

The 100-year flood level currently used by SVCA is 177.6m GSC. It is based on the 100-year instantaneous water level calculated for Lake Huron sector H-18 in the MNR (1989) Great Lakes System Flood Levels and Water Related Hazards report. MNR calculated the flood levels using a combined probability analysis on mean lake levels and wind setup (storm surge) heights. Setup surge heights were first determined for locations with measured data, and then calculated with a numerical circulation model for shoreline reaches between those locations. The surges determined from measured data were used to calibrate the circulation model. Locations with measured data included Tobermory and Goderich. Surges at Port Elgin were calculated with the circulation model.

We performed a series of extreme value analyses on an annual maxima series of measured water level data to assess the likelihood of the MNR 100-year return period value changing due to the inclusion water levels recorded

since that analysis was completed. We considered both hourly and daily mean water level data over the available periods of record for both the Tobermory and Goderich water level data sets available from the Canadian Hydrographic Service.

Tobermory has both daily and hourly data for the period from 1962 to present. Goderich has hourly data from 1962 to present and daily data from 1920 to 1944 plus 1962 to present, but data from June 1 to August 31, 1965 was missing so 1965 was excluded from the annual maxima data series used due to the possibility that the annual maximum level may have occurred during the missing data period.

The data was divided into sets with and without the period from 1988 to 2020. Extreme value analyses were completed for each data set using both Gumbel and Weibull probability distributions. In all instances the Weibull distribution produced the highest correlation. Table 1 identifies the data set analysed, the number of years of data in the annual maxima series, the estimated 100-year value, and the analysis correlation coefficient.

It can be seen that for each pair of data sets including or excluding the 1988 to 2020 data, the 100-year level estimate is lower when the 1988 to 2020 data is considered. This confirms the expectation that we discussed.

It is not surprising that the 100-year estimates are lower given the extended period of low water levels that occurred between 2000 and 2013. Examining the highest and lowest 15 values in the two hourly data annual maxima series, we found that at Tobermory 3 of the 15 highest values and 11 of the 15 lowest values occurred after 1988. At Goderich 5 of the 15 highest values and 10 of the lowest values occurred after 1988.

Table 1 Water Level Extreme Value Analysis Results

Data Set	Duration (years)	estimate (m IGLD1985)	Correlation
Tobermory hourly data			
1962-1988	27	178.07	0.9409
1962-2020	59	177.97	0.9773
Tobermory daily data			
1962-1988	27	178.01	0.9469
1962-2020	59	177.90	0.9817
Goderich hourly data			
1962-1988	26	178.20	0.9444
1962-2020	58	178.08	0.9828
Goderich daily data			
1920-1988	51	177.88	0.9798
1920-2020	83	177.82	0.9895

It is our opinion that considering the water level data measured over the last 32 years does not give sufficient cause to change the 100-year flood level used by SVCA. We note that other conservation authorities on Lake Huron and Georgian Bay have used the MNR (1989) 100-year flood level when they have updated their shoreline management plans and shoreline policies.

We also note that we have not investigated the implications of the range of predicted water levels shown in Table 1. The purpose of this analysis was to consider the influence of the last 32 years of data on the estimate of the 100-year flood level; it was not intended to validate the results of the MNR (1989) study, which used a different analysis methodology.

SVCA 1. a. ii. Topographic data used to establish beach transects should be re-evaluated for accurate wave runup calculations and to accurately locate the 100-year flood level on site.

It is our understanding that the genesis of this statement is Zuzek Inc.'s peer review of our original report, summarized as "*The location of the 100-year flood level is unknown due to the presence of a temporary construction road when the survey data was collected for Shoreplan*." They also note "*We have not reviewed the SWOOP elevation data, Hewett and Milne Limited survey, or the new site-specific UAV elevation data collected locally for Shoreplan*."

The 100-year flood level is the water level at which the runup calculations are carried out, so the contour line is the "current" shoreline on a dynamic beach. Uprushing waves break lakeward of the shoreline, and the uprush limit is landward of the shoreline. The specific location of the 100-year flood level contour is not part of the uprush calculation. It is plotted for general reference, but because it is on a dynamic beach its location will move.

The temporary construction access road had a small ridge at the water's edge. That ridge was removed from each of the profiles used in the runup calculations so that the access road did not affect the runup results. The topographic UAV survey was completed by an experienced surveying firm and matched the survey prepared by an Ontario Land Surveyor. There is no cause to question the accuracy of their work.

SVCA 1. a iii. Conclusions pertaining to wave runup evaluation/flood hazard limit are inconsistent within the Shoreplan Inc. report. Three different runup elevations were presented. It is our understanding that the proposed floodproofing elevation is 177.65. If so, please amend the report appropriately.

The last paragraph on page 4 of our report starts with "*The furthest inland incursion of wave uprush was found along the profile extending through the*

low area at the handicapped parking spot. The uprush elevation was calculated to be 178.65m, which is only 25cm above the 100-year flood level, but that water propagated across almost the full width of the parking lot." The 178.65m number is a typo and should have read 177.85m. The correct uprush elevation of 177.85 is repeated twice further in that paragraph.

We strongly disagree with Zuzek's characterization that an uprush height of 1.05m is more appropriate than 0.25m for similar conditions and shoreline geometrics. The limit of uprush along that profile is 85m inland of the walkway along the back of the beach. Even a 25cm height is likely to be excessive, but there are no more reasonable means of completing uprush analyses for this scale of project. Lake Huron experienced new record high monthly mean lake levels in 2020, and there were a number of significant storm events. There was never anything remotely close to a 1m depth of water on the parking lot.

We do not discuss any other flood hazard uprush elevations in our October 2020 report. Uprush associated with floodproofing is a separate item and the distinction between a flood hazard assessment and a floodproofing assessment is important. Figure 5 in our report has a plot showing an uprush elevation of 178.83m on the constructed dune south of the marina, but that figure was included as an example only. That uprush elevation did not cause the governing flood hazard limit so it was not discussed, but its impact can be seen in Figure 1 from our report. A portion of the constructed dunes adjacent to the marina are not within the flood hazard because, as shown in report Figure 5, the uprush does not extend all the way up the dunes.

It must be recognized that there is no single uprush elevation that applies to the entire site. Both nearshore wave conditions and backshore geometry vary along the site, and so uprush elevations also vary. The flood hazard limit only follows the 177.85m contour along part of the parking lot because it is a conservative estimate of the assumed lateral flooding in the lee of the constructed dunes. The flood hazard limit in the southern portion of the site is based on the results of the southernmost profile.

Our report provided general comments related to floodproofing. We did not provide a specific floodproofing elevation because floodproofing requirements are dependent upon the proposed development. We noted that a site grading plan and specific building floodproofing design could be produced during detailed design of the development. We have recently been provided with more detailed plans for the development and floodproofing is discussed separately below.

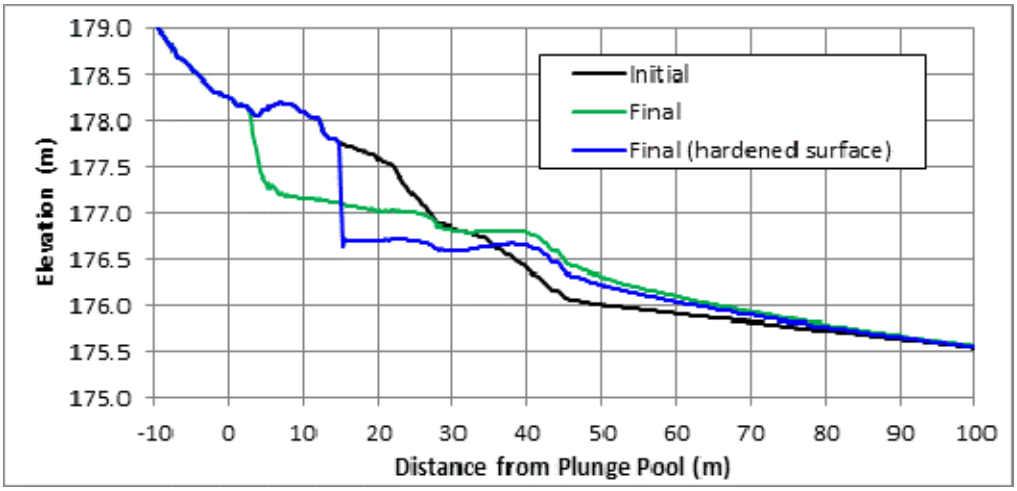
SVCA 1. b i. The Shoreplan Inc. report did not provide any scientific or engineering justification to substantiate eliminating the 30 m dynamic beach allowance. It is our recommendation that this decision be demonstrated appropriately.

SHOREPLAN

The purpose of the 30 metre allowance is to avoid interference with the natural beach and dune interaction that takes place on a dynamic beach. This is an urban site that was developed decades ago, if not a century, and there are no natural dunes or other beach features landward of the walkway. A key role of dunes is to supply sand to nearshore breaker bars during severe storm events at high water levels. The 30m allowance seeks to preserve this key role. Sand will not be transported offshore into bars at this site. Sand on the landward side of the walkway does not play a role in the protection and maintenance of the beach profile. Town maintenance practice is to groom the beach and grade the sand parking lot as and when required in order to preserve their current conditions. Should the existing walkway be damaged by wave action, the Town's response will be to repair it.

The figure below shows what happens when a hardened surface is included in a beach profile evolution numerical model. That example is not for this site. It shows the initial and calculated final beach profiles after a 100-year storm at the 100-year water for the Bruce Road 25 proposed outfall structure analysis we completed for Saugeen Shores in 2018. A hardened surface was introduced to the model at a distance of 15m along the profile. The model shows profile evolution stopping at that point.

Example of Impact of a Hardened Surface in a Profile Evolution Model



Actual results of a similar exercise at Cedar Crescent Village would be notably different because the Road 25 site has a mature foredune and is not sheltered by a breakwater, but the same basic principal would hold true. The

walkway is a hardened surface that separates the beach from the backshore parking lot. It is not necessary to model this site to state that the walkway defines the limit of natural beach processes.

MNR (2001) defines the dynamic beach allowance as either a 30 metre default allowance or an allowance based on a study using accepted scientific and engineering principles. Our careful consideration of the existing site conditions, regular maintenance activities, and the implications of a hard surface within the uprush zone directly follow engineering principles. This report constitutes a study using accepted engineering principles.

SVCA 1. c i. As noted in Mr. Zuzek's report, calculated wave overtopping rates of 5 to 10 l/s/m may be high enough to be dangerous to pedestrians and vehicles. Further, these heights may result in structural damage to buildings located near the shoreline or marina walls. It would be helpful if Shoreplan Inc. were to explain what measures are in place or are expected to be in place to protect people and property because of this new development.

The design wave condition for the marina walls overtopping calculation had a significant wave height of 0.35m and a peak wave period of 11.4 seconds. Mean overtopping rates of 5 to 10 l/s/m produced by that wave will at most be a hazard to pedestrians on the marina walkway, not within the proposed development. No vehicles will be in any danger due to overtopping flows.

As part of its discussion on tolerable overtopping limits with respect to people, the 2018 Overtopping manual notes "*for very small wave heights, say <0.5m, no limits are needed*". Overtopping associated with significant wave heights less than 0.5m poses no threat to pedestrians. No measures are required within the proposed development beyond the floodproofing discussed below. A far greater risk to pedestrians will be the 80 kph or greater sustained wind speeds that produce the design wave condition.

SVCA 1. d i. On September 10, 2020, SVCA staff requested that the impacts to adjacent lands be assessed from development proposed within the flooding hazard limit. The Authority is particularly concerned about whether there will be increased flooding and erosion to adjacent lands. In addition, the Authority's interests also extend to whether natural shoreline processes will be impeded. In additional information provided back to the Authority for our review, it is necessary that the Town of Saugeen Shores include this information in their response.

The proposed development is located landward of a hardened walkway that separates the beach from the existing parking lot. The development will have no impact on erosion or natural shoreline processes on the shore fronting the development site. We see no reason to expect it will impact erosion or natural processes on any other lands, including the adjacent lands. The

Zuzek report did not cite any erosion or natural process concerns for the adjacent lands. Should SVCA have specific concerns in these matters we ask that they provide a more detailed explanation of those concerns so that we may address them.

Zuzek does opine that the proposed floodproofing measures are expected to have a measureable impact on neighbouring properties to the south. We disagree. The floodproofing concept discussed in our report is to raise the backshore elevation with fill. Such action can impact adjacent lands when done in a conveyance channel such as a river, creek, or drain, where the flow capacity of the channel is reduced because of the infill. That does not happen on the shores of the Great Lakes where the loss of storage capacity is insignificant compared to the surface area of the lake. The fill will be graded with positive drainage back towards the lake, not towards the adjacent lands. The fill prevents uprushing waves from flooding the site by keeping that water in the lake; it does not direct that water onto adjacent lands. Due to the size of Lake Huron compared to the size/volume of fill proposed, there cannot be measurable impacts resulting in higher water levels on other properties.

Additional comments regarding floodproofing are provided below.

Floodproofing Concepts

Figure 1 below shows a draft Mater Plan concept for the Cedar Crescent Village site and the Town owned lands to the south. We have coloured three sections of a sidewalk that follows the perimeter of the plan. The portion identified as Section 2 fronts the path of the greatest exposure of the building locations to wave uprush. If Section 2 of the sidewalk is constructed at elevation 178.5m GSC, wave uprush will just reach the edge of the sidewalk in front of the proposed buildings under floodproofing design conditions. This was calculated using the uprush procedure described in our October 2020 report and assumed a rise in grade from the landward side of the existing paving stone walkway to the new sidewalk. There would be an approximately 0.5m rise in grade over a width varying between approximately 14 and 22m. That is a gentle enough slope that the fill could be stabilized with suitable vegetation, including dune grasses if so desired. This could also be an opportunity to re-establish portions of the dunes that were once part of this site.

Raising Section 2 to the wave uprush limit under floodproofing design conditions allows suitable flexibility in the design of the inland grading while ensuring the proposed new buildings are safe from flooding under design conditions. It is our standard practice to recommend that the lowest structural openings in buildings near the shoreline be a minimum of 300mm above the surround grade. Having a minimum opening elevation of 178.8m would meet that recommendation.

The elevation of Sections 1 and 3 shown on Figure 1 may vary as required to produce a workable grading plan for the entire site. We recommend that Section 1 be at elevation 178.0m or higher to prevent any water that overtops the marina wall from flooding into the development site.

Under floodproofing design conditions a minor amount of water could overtop Section 2 of the sidewalk near the southern end of the section, where the slope fronting the sidewalk in front of the parking lot is steeper than the slope further to the north. That overtopping water will be directed away from the buildings further inland by the parking lot grades.

Section 3 of the sidewalk can also be graded as required to fit into the overall side grading plan. We recommend that it also have a minimum elevation of 178.0m, except at its southern end where it may need to be lower in order to accommodate any existing grade. Any water that overtops Section 3 under floodproofing design conditions will be minor and easily accommodated with site grading. It will not be significant and will not pose a risk of damage to the parking lot any greater than that associated with a heavy rain storm.

Closing Comments

We trust that this letter addresses SVCA's comments to your satisfaction. Please feel free to contact us if you have any comments or questions.

Yours truly,

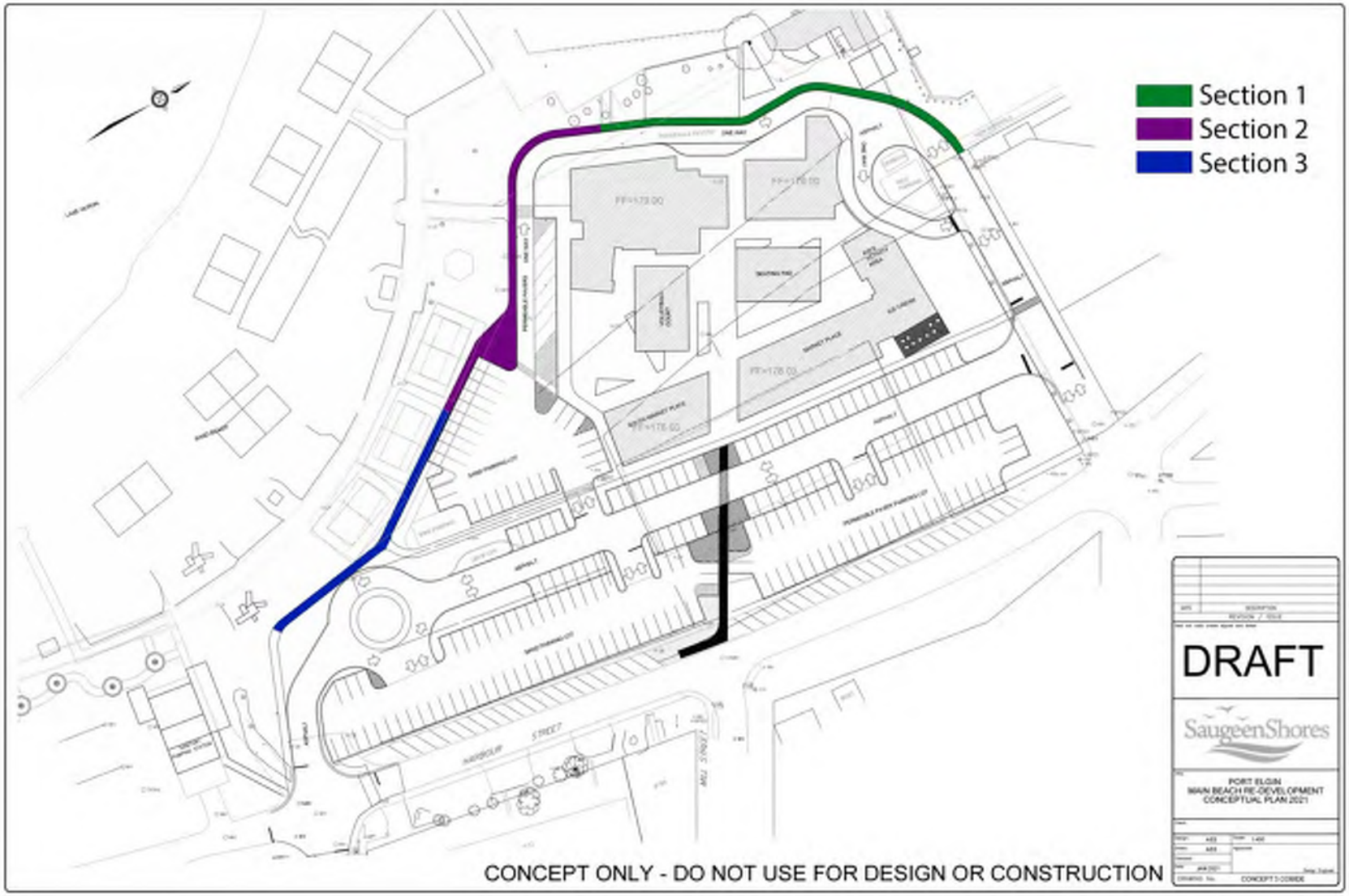
Shoreplan Engineering Limited

Bruce Pinchin, P. Eng.

M. Sturm, P.Eng.

ec: Paola Donnini: padonnini@gmail.com

Figure 1 Draft Master Plan



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amanda.froese@saugeenshores.ca

April 22, 2021

Jennifer Stephens
General Manager/Secretary- Treasurer
Via email: <j.stephens@svca.on.ca>

Re: March 29th Comments and resubmission for Cedar Crescent Village

Dear Jennifer,

We are pleased to provide you with the following responses that satisfy the concerns expressed in your letter from March 29th and look forward to advancing the project with you. We would like request a meeting, preferably the week of April 26th, with both Coastal consultants to allow for a more fulsome discussion of our proposal and how it meets your requirements.

We offer the following responses:

1. **Costal Report Technical Review:**
   a. **Flood Hazard Assessment**
      i. **Last 32-years of measured water levels:** Shoreplan Engineering Limited (Shoreplan) completed an analysis of the data from the last 32 years as requested. With a very high correlation between the two data sets it is confirmed that the original engineering analysis completed by Shoreplan was appropriate in determining the **100-year flood level of 177.6m GSC.**

The enclosed Shoreplan letter contains a more detailed response. This item is therefore no longer a concern and is considered addressed.

      ii. **Topographic Data:** The model used by Shoreplan corrected for the small ridge of the construction road, and therefore it did not interfere with the calculations. Therefore, the location depicted of the **100-year flood level of 177.6m GSC remains appropriate**.

The enclosed Shoreplan letter a more detailed response. This item is therefore no longer a concern and is considered addressed.

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iii. **Wave Uprush Elevation/Flooding Hazard Limit:** The position of the Flooding Hazard Limit on Figure 1 was confirmed, utilizing the elevation of 177.85m for a conservative limit line.

The response letter enclosed is proposed to be incorporated into the project file and considered an addendum to the original report.

The enclosed Shoreplan letter contains a more detailed response. This item is therefore no longer a concern and is considered addressed.

iii. **Floodproofing:** Flood proofing is dependent upon the proposed development and therefore general statements were prepared within the original report to determine the hazard line and to work with the developer and SVCA to determine impact on the development potential of the lands. In order to respond to the SVCA comments we provided Shoreplan with a concept plan of both the development site and the adjacent municipal parking lot south of the development. The layout shown is the same layout as presented to and supported by Saugeen Shores Council. However, this concept plan is not approved and therefore, the details of the concept plan may change. The intention is that future proposals will be in general conformity with the concept plan for both the development and the parking lot. The construction plans shall be required to be in keeping with the recommendations of Shoreplan as a condition of the SVCA permit and the Site Servicing Agreement. The Developer and the Town of Saugeen Shores as per the executed lease agreement will enter into this agreement. For example, building limited to the extents shown, grading and flood-proofing (openings) shall incorporate the specified elevations contained within the Shoreplan recommendations. We recognize that the SVCA will require a new permit for work outside the development application and that design shall be in keeping with the Shoreplan recommendations.

This item can be controlled through the conditions contained within the SVCA permit and the lease agreement between the Town of Saugeen Shores and the Developer. This item is therefore no longer a concern and is considered addressed.

b. Dynamic Beach: This site is a highly disturbed site without natural dunes, with a break-wall and a harbour between it and the lake. On the landward side of the hardened walkway (known as the promenade) is the Town's parking lot. This parking lot is maintained by heavy equipment and it is graded in the spring and after rainfall events to ensure it can be used for parking. The Beach Maintenance Plan (https://www.saugeenshores.ca/en/explore-and-play/resources/Documents/Saugeen-Shores-Beach-Maintenance-Plan-2021.pdf)

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describes the routine works carried out in this location (Maintenance Zone 4). Mechanical raking of the beach west (lakeside) of the promenade occurs four (4) times through the season, and hand raking occurs as required. Weeding of the manmade dunes and landscaped areas is routinely carried out. The promenade is swept weekly and repaired when damaged. There are no dunes or other beach features on the landward side of the walkway and therefore the dynamic beach does not apply to the development area, negating the need to apply the 30m default allowance.

The enclosed Shoreplan letter contains a more detailed response. The Town assumes the responsibility to carry out the Beach Maintenance Plan as directed by Council. This item is therefore no longer a concern and is considered addressed.

c. **Impacts on Property/Public Safety (Wave Overtopping):** The depth and duration of the overtopping were determined not to be significant and limited to pedestrians on the marina walkway, not within the development. The depth is also considered not to be a threat and no measures are required by the development to protect people and property. The development does not create the over topping condition.

The enclosed Shoreplan letter contains a more detailed response. This item is therefore no longer a concern and is considered addressed.

d. **Impact on flooding and erosion to adjacent lands:** Shoreplan reviewed the concept plan that included parking on the adjacent Town property. They include this area in the flood-proofing discussion. As the development lies on the landward side of the walkway, there will be no impact on either the erosion or natural processes of the shore. The proposed flood-proofing measures do not contribute to higher lake levels because they do not result in a loss of measureable storage in the lake. Grading with positive flow towards the lake, recommended in the response letter, can be a condition of the current and future permits.

This item can be controlled through the conditions contained within the SVCA permit and the Site Servicing Agreement between the Town of Saugeen Shores and the Developer. This item is therefore no longer a concern and is considered addressed.

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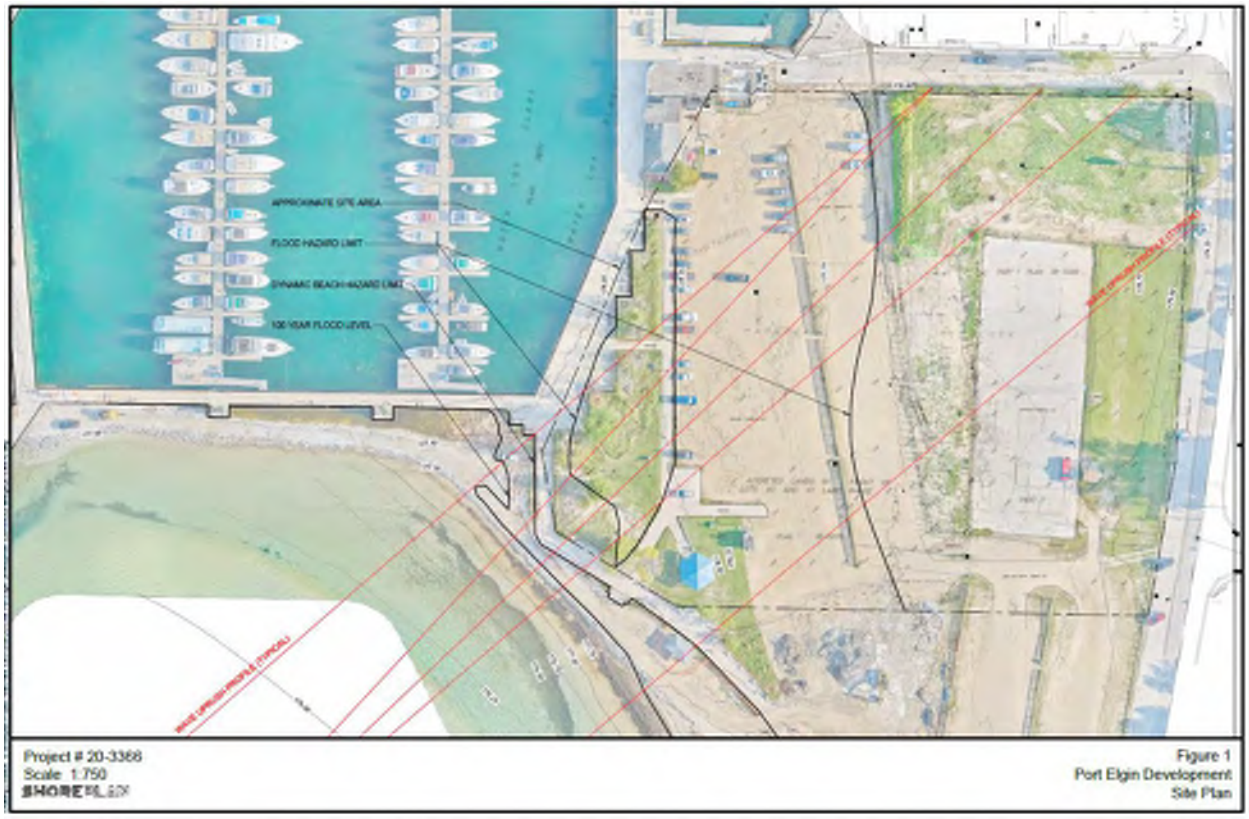
2. **Final Site Plan/Drawings**
    1) **Addendum**: Enclosed Shoreplan Letter and responses above**.**
    2) **New Development within the Flooding Hazard:** It is our position that the proposed development is suitable within the parameters listed in the SVCA's response letter as follows:

Dynamic Beach Limit – the development is proposed to be located outside the Dynamic Beach limit.

Flooding Hazard Limit– The flood line hazard line remains as shown in Figure 1 (below as taken from the October 28th, 2020 Shoreplan #20-3366 Report). Ontario Regulation 169/06 states that a Conservation Authority may grant permission for development within the limits of natural hazards "if in its opinion the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development." This requirement is satisfied through Shoreplan's recommended flood-proofing and grading requirements and implementation of the Town's Beach Maintenance Plan that can carry over into conditions of the permit. This is similar to the requirement imposed on the Bruce Road/Shipley Watercourse permit and can be incorporated into the Site Servicing Agreement between the Town and Developer that is noted in the signed lease agreement.



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The process allows the Conservation Authority to approve with conditions this development and issue a permit. The Town requests that if this cannot be done at the staff level that we schedule a hearing to allow us the opportunity to present to the Executive Committee of SVCA's Board of Directors.

Thank you in advance for your attention to this file, and I look forward to hearing from you.

Sincerely,

Amanda Froese, P. Eng., FEC
Director, Infrastructure and Development Services

cc: Grant Diemert, Applicant's Agent (via email)
Brandi Walter, Coordinator, Environment Planning, SVCA (via email)
Erik Downing, Manager, Environmental Planning and Regulations, SVCA (via email)
Kara Van Myall, CAO, Town of Saugeen Shores
Jay Pausner, Supervisor, Development Services, Town of Saugeen Shores

encl: Shoreplan Response Letter
Beach Maintenance Plan (February 2021)

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, Fax 519-367-3041, publicinfo@svca.on.ca, www.svca.on.ca

SENT BY E-MAIL ONLY (kara.vanmyall@saugeenshores.ca)

May 12, 2021

The Corporation of the Town of Saugeen Shores
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON
N0H 2C0

ATTENTION: Kara Van Myall, Chief Administrative Officer

Dear Ms. Van Myall;

RE: SVCA Application for Development: Cedar Crescent Village – Second Submission
122 Elgin Street
Roll No. 411046000335300
Plan 259, Harbour Block 2
Geographic Town of Port Elgin
Town of Saugeen Shores

Saugeen Valley Conservation Authority (SVCA) staff acknowledge receipt of your letter, dated April 22, 2021 regarding the proposed Cedar Crescent Village (CCV) at 122 Elgin Street, Geographic Town of Port Elgin, Town of Saugeen Shores (TSS). We have reviewed your letter and the associated correspondence from Shoreplan Engineering Limited (SEL), dated April 19, 2021.

As discussed on Thursday, April 29, 2021 when SVCA and TSS staff met to discuss the technical information submitted to accompany the permit application for this development, there is outstanding critical information which is required to complete the application submitted on February 1, 2021. Example components of a complete application are outlined in SVCA's Environmental Planning and Regulations Manual on Page 234. To complete our review, SVCA recommends that the following materials be submitted.

1. **Flood Hazard Assessment**

a) The 100-year flood elevation, which is based on 1988 data, should be assessed to confirm whether the MNR 1989 levels remain representative of the current risk associated within the 100-year instantaneous water level on Lake Huron. SEL's methodology for the extreme value analysis is not consistent with the approach used by MNR (1989) to establish the instantaneous lake level of 177.6 m GSC (100-year lake level). As such, SVCA recommends that an assessment of the 100-year flood level based on a joint probability analysis of storm surge and static lake level should be completed for the entire period of available data at the Goderich and Tobermory gauges to re-assess the historical MNR (1989) results.

Recommended methodology to address this requirement:

The joint probability analysis should consist of the following steps:

- An extreme value (EVA) analysis of the historical monthly mean lake level data (lakewide average, available from the Department of Fisheries and Oceans), including 2020.
- EVA of measured storm surges from the Goderich and Tobermory water level gauges using all available hourly data (with storm surges extracted from the hourly water level record).
- A joint probability analysis on the monthly mean and storm surge EVAs for the Goderich and Tobermory gauges.
- Compare the results to the published MNR (1989) data at Goderich and Tobermory. If differences are noted, the published gradients in the 100-year instantaneous water levels from MNR (1989) can be used to establish a revised level for Port Elgin/Southampton.

b) SVCA recommends that clarification be provided as to why the maximum potential uprush elevation from the six analyzed transects are not considered for the delineation of the flood hazard limit, versus the lowest uprush elevations. The uncertainties on where the runup profiles were extracted from and if they represent the most flood prone portion of the beach is a critical input into the wave uprush calculation, as is the 100-year flood level.

Recommended methodology to address this requirement:

- If the 100-year flood level increases at Port Elgin/Southampton, then the runup analysis will have to be repeated.
- In Figure 1 of the original SEL report (Oct. 28, 2020) the runup profiles were mapped. There is no analysis of wave runup potential for the lowest section of the walkway (identified as the beach maintenance access point by Ms. Van Myall on the April 29, 2021 conference call between SVCA and TSS staff).
- This vulnerable section of the walkway needs to be evaluated for wave uprush to map the flood risk for the existing site conditions. The results should be presented in 2D for the beach and the parking lot at Port Elgin with either AutoCAD or GIS for the maximum potential uprush limit, not the lowest uprush elevation.

2. **Dynamic Beach Hazard**

There has been no technical data or study to substantiate the position that the walkway is the inland limit of the Dynamic Beach Hazard. Further, the material presented by SEL does not constitute a study. As such, it remains SVCA's recommendation that a technical study be undertaken to support the reduction of the dynamic beach hazard limit at this location.

Recommended methodology to address this requirement:

A long-term shoreline change analysis is required to evaluate beach stability over the full range of water level conditions using historical aerials (e.g., 1970s and 1980s) and recent orthophotography. A robust technical analysis would also consider the future stability of the beach to lake levels higher than the 100-year instantaneous level, as the latest Environment and Climate Change Canada projections call for higher lake level extremes in the future.

- Winter ice-cover has already decreased on Lake Huron and further reductions are projected. Analysis of future beach stability for ice-free winters and exposure to storms 365 days of the year is required.
- This work and other potential analysis is required to evaluate a potential reduction in the 30 m dynamic beach allowance.
- The northern limit of the walkway is in the dynamic beach hazard limit. As part of the site re-development, consideration should be given to re-aligning the northern section further inland and re-nourishing the beach in this area to increase resilience to periods of future high lake levels.

3. **Adjacent Flood and Erosion Impacts and Floodproofing**

Until items 1 a) and b) as outlined above have been addressed, SVCA cannot conclude that the recommended floodproofing elevations are acceptable; nor can we conclude the proposed development will not impact flooding on adjacent lands. Per the discussions that took place on Thursday, April 29, 2021, this requirement will follow once Items #1 and #2 have been submitted and are approved.

Downdrift impacts to the control of erosion on adjacent properties (private lands) should not occur because of the development. However, the Town should expect damage to the walkway on the lakeside of the proposed development during times of high lake levels and this response will need to be verified once items #1 and #2 are addressed.

4. **Site Plan/Draft Master Plan and Engineering Drawings**

As with Item #3, the Site Plan, Draft Master Plan and Engineering Drawings are only required to be presented after Items #1 and #2 have been submitted and approved. It is recognized that the information gleaned from having completed the Flood Hazard Assessment and Dynamic Beach Assessment would be necessary to inform the Site Plan, Draft Master Plan, and Engineering Drawings. To assist the TSS with their future submission of the site plan, it is recommended that the Plan include the flood hazard limit and the dynamic beach hazard limit, once the above noted concerns have been addressed.

The Site Plan should indicate how flooding or erosion processes and energy will be addressed through elevation and structural design, and if surrounding properties will be impacted. Maintenance requirements ought to be a component of design details within flood or erosion areas.

Options to Move Application Forward

The completeness of an Application is determined by SVCA staff, or an administrative review can be requested by the applicant to the SVCA's General Manager/Secretary Treasurer. If the administrative review by the SVCA's General Manager/Secretary Treasurer determines an Application is not complete, the applicant can request an administrative review by SVCA's Executive Committee.

In accordance with Section 28 (12) of the *Conservation Authorities Act*, permission required under Ontario Regulation 169/06, as amended, shall not be refused or granted subject to conditions unless the person requesting the permission has been given the opportunity for a hearing (by request) before the Authority or, in the case of the SVCA, before the Authority's Executive Committee. Should you receive an SVCA permit, approved by staff, with conditions of approval and object to one or more of the conditions, you will have the option to attend a hearing before the SVCA Executive Committee. Should you submit a complete Application for which staff is not prepared to issue a permit, you will have the option to attend a hearing scheduled before the SVCA Executive Committee.

After holding a hearing under Section 28 (12), the SVCA Executive Committee shall,

(a) refuse the permission; or
(b) grant the permission, with or without conditions

After the hearing, if the Executive Committee refuses permission, or grants permission subject to conditions, the person who requested permission shall be given written reasons for the decision. If the person is refused permission or objects to conditions imposed on the permission, the person may appeal to the Minister of Natural Resources and Forestry within 30 days of receiving the reasons for the refusal.

We trust the above information is helpful to you and confirms our desire to help move the CCV application forward. It is SVCA's desire to support municipalities in their efforts to grow in a safe and sustainable way that protects our environment and their residents. Please feel free to reach out to me should I be able to provide you with any further assistance.

Sincerely,

Jennifer Stephens
General Manager/Secretary-Treasurer
Saugeen Valley Conservation Authority

BW/PZ/ED/JS

cc: Grant Diemert, Applicant's Agent (via email)
Cheryl Grace, Director, SVCA (via email)
Mike Myatt, Director, SVCA (via email)
Brandi Walter, Coordinator, Environment Planning, SVCA (via email)
Erik Downing, Manager, Environmental Planning and Regulations, SVCA (via email)
Peter Zuzek, Technical Support, Zuzek Inc. (via email)

Town of Saugeen Shores
600 Tomlinson Drive, P.O. Box 820
Port Elgin, ON N0H 2C0

June 4, 2021

Jennifer Stephens
General Manager/Secretary-Treasurer
Saugeen Valley Conservation Authority
SENT BY EMAIL: j.stephens@svca.on.ca

Re: Cedar Crescent Village Permit Application (122 Elgin Street, Port Elgin) Third Submission

Dear Ms. Stephens,

The Town's project team offers this letter as a response to the most recent request for additional information to complete the application for the above noted property. As acknowledged, the Flood Hazard Assessment (#1) and the Dynamic Beach Hazard (#2) are the initial items requiring acceptance by the SVCA in order to advance the complete application requirements. It is the goal of the team to satisfy these concerns and move ahead with the permit approvals and detailed engineering work to meet a September construction date.

1. Flood Hazard Assessment

The Town has been advised by our Engineer and it is their opinion "**that this sort of study would be best done comprehensively and should not have to be the responsibility of a project proponent"** (their bold)**.** They further note, "we have worked on many projects on Lake Huron with multiple conservation authorities and this is the first time a proponent has been requested to update the design water level. Ausable Bayfield Conservation Authority (ABCA) updated their shoreline management plan in 2019, Nottawasaga Valley Conservation Authority (NVCA) updated flood and dynamic beach hazard limits along their shoreline in 2017, and St. Clair Region Conservation Authority (SCRCA) updated their shoreline management plan in 2011. All of those studies used the MNR (1989) design water levels. Mr. Peter Zuzek is identified as a reviewer of the first draft of the SCRCA plan (while with his previous firm) and we believe he is therefore familiar with these studies and the approach. Shoreplan Engineering is currently working for SCRCA on a number of waterfront projects and have not had any requests to update the design water level."

The Town does not disagree with the request to "engineer" the flood hazard limit for this project as we understand the Conservation Authority believes the current estimated limit is not reflective of recent experience. We also recognize that in a river environment, this is routinely requested. The Town's concern is the requirement to analysis the flood hazard to a new standard, above the MNR model that is used as the industry standard. Our concern is that once this new model is created it will become the standard approach for all development work along the shoreline and may limit the ability for others to prepare these studies, and cause an increased cost for all.

In conclusion of this point, what is requested is non-standard and outside the industry practice throughout other conservation authorities along Lake Huron. Knowing this information, Town Council did authorize the funding of this additional work at its May 25th Committee meeting at the Town's expense. We anticipate this will take approximately 100 hours of consultant time.

2. Dynamic Beach Hazard

The Town does not agree with the suggested approach to assessing the Dynamic Beach Hazard and we have not authorized this additional work. Reviewing aerial photographs, as suggested, only shows the location of the water line when the photo was taken. It is not possible to differentiate between beach movement and changes in water level. A detailed analysis of dynamic beach movement on shorelines without dunes requires a 2D or 3D sediment transport models, and those models will stop beach evolution when they hit a hardened structure like the walkway/ promenade. Shoreplan's, April 19 letter provided an example of using a 2D profile model for a different site in Saugeen Shores illustrating that a hardened structure clearly impacts the limit of the Dynamic Beach Hazard.

Zuzek Inc. completed a Lake Ontario Shoreline Management Plan for three conservation authorities in 2020. That study included 16 dynamic beaches classified as stable and they used the default allowance to determine the setback rather than calculating a limit. That study includes the paragraph "An example of the dynamic beach hazard limit for Iroquois Beach in Whitby is provided in Figure 5.7. The lakeward limit is 200 m offshore of the waterline and the landward limit extends 15 m inland from the 100-year flood level plus 30 m for the dynamic beach allowance. If the setback intersected a feature other than sand beach, such as the road in Figure 5.7, **the hazard limit is terminated at the non-dynamic feature**." (our bold, page 59, November 5, 2020)

The Town finds it concerning that a different standard is being applied to the Port Elgin Main Beach location and the impact of the walkway/promenade is being discounted to its relevance at this location. Creating a model, in the same fashion that was completed for the Lake Ontario Study would terminate the dynamic beach limit at the walkway, the same as the Shoreplan recommendation previously provided.

This leads to the conclusion that the parking lot area is not acting as a dynamic beach; it is landward of the walkway/promenade and does not go through continuous change due to natural erosion or accretion. The Town grades and maintains this area as a parking lot. The parking lot function has been in place for over a century. Predominately re-graded in the spring and after rainfall events due to runoff from upstream areas, the area is maintained without removal of sand. The Town maintains this area in accordance with the Beach Maintenance Plan.

The last point to be made with regards to the Dynamic Beach Hazard is that enhancement of this parking lot is proposed as a separate project, and will be under a separate permit application. Decisions in the issuance of this application does not preclude the Conservation Authority and Town from completing other works off site of the development site of 122 Elgin Street.

Further Points of Clarification

In addition to the comments related specifically to #1 and #2 of the May 12th correspondence, there are two additional areas of the letter that the Town would like to respond to:

A. We are concerned with the additional comment added to the correspondence that suggests that higher water levels need to be considered due to the effects of climate change. It is our understanding that this issue was resolved at a prior meeting between the Town and SVCA. Again, we do not think an assessment of the potential impact of climate change on design water levels should the responsibility of a project proponent. Although we agree that consideration of climate change must be made in line with the Provincial Policy Statement, the research regarding water level impacts is far from specific regarding magnitude. All reports dealing with estimates of water level changes note a high degree of uncertainly. We believed the discussion around climate change was previously resolved and therefore request concurrence that it does not require further investigation.

B. Aspects of the correspondence are outside of the development permit application. Specifically, referenced is the following:

The northern limit of the walkway is in the dynamic beach hazard limit. As part of the site re-development, consideration should be given to re-aligning the northern section further inland and re-nourishing the beach in this area to increase resilience to periods of future high lake levels.

Respectfully, we request that the comments be relevant to the area of development that has been submitted for the development permit at 122 Elgin Street to enable everyone to effectively respond to and advance the required information to support the application. The Town will work with SVCA staff through the development of the works outside the development area as that work progresses.

We appreciate the time and effort that went into the letter of May 12th, 2021 and the offer to review the Town's position on the Dynamic Beach Hazard while the work is underway on the Flood Hazard Assessment. We look forward to your response on to the additional points A and B noted above in order to support the completion our application. With the delays that have occurred to the desired construction timing, we wish to continue advancing the detailed engineering work and will commence that work with the revised Flood Hazard Limit as soon as it is available from Shoreplan Engineering. A construction start in the Fall of 2021 is desired, and assumed not to be affected by any fishery windows or other restrictions, and request that the permit dates allow for that.

Sincerely,

Kara Van Myall, CAO
Town of Saugeen Shores

cc. Grant Diemert, Applicant's Agent
Maureen Couture, Chair, SVCA
Cheryl Grace, Director, SVCA
Mike Myatt, Director, SVCA
Brandi Walter, Coordinator, Environment Planning, SVCA
Erik Downing, Manager, Environmental Planning and Regulations, SVCA
Amanda Froese, Director, Infrastructure and Development, Saugeen Shores
Phil Eagleson, Director, Protective Services, Saugeen Shores
Council, Town of Saugeen Shores

Saugeen Shores
Beach Maintenance Plan

Town of Saugeen Shores
Beach Maintenance Plan

February 2021 Version

GIS Data Source: Town of Saugeen Shores and County of Bruce

Introduction

The Saugeen Shores waterfront has long been a desirable destination with 18 km of shoreline that marries soft sands, vegetation and rocky shoals. The Waterfront Master Plan recognized 10 destinations (or zones) based on similar geography, facilities and marketing opportunities. These 10 destinations have been the basis of organizing this plan and defining beach maintenance activities for each destination.

The level of service that has been described in each destination is considered to be the "existing" level of service that the Municipality is able to provide. In extenuating circumstances, there may on occasion, be an increase or a decrease in service. Every attempt will be made to communicate changes in the level of service to citizens utilizing www.saugeenshores.ca and other notices as required.

Level of Service

Level of service as in many cases can be a subjective observation based on ones expectations, personal preferences and memories of the past. This document will strive to define the current level of service in a quantitative fashion to allow for deliberations and changes if required.

The current level of service, for the most part, is defined by how things were done in that past and what resources have been available. An in-depth look at what is being offered by the Town on its waterfront for upkeep and maintenance is essential to weigh the many factors that will affect beach users of today and in the future.

Level of service can be viewed in terms of quality, function, safety, environment, resources, expectations, regulations, etc.

Changes in level of service will impact operating budgets and will be considered by Council as part of budget deliberations annually. Citizens are encouraged to communicate their concerns and issues in regard to specific areas along the waterfront through "Report a Concern" which is accessible on the municipal web site at www.saugeenshores.ca or alternatively by contacting the municipal office at 519-832-2008. Requests will be reviewed annually to determine where trends appear to be forming and will be a basis for future operating procedures.

Effective waterfront stewardship is a function of balancing environmental, social, and economic interests. Often in the past, the environment was left out of the equation. In order to sustain our natural waterfront, we need to act now for the future.

Waterfront Ecology

Citizens hold nostalgic views of wide sandy beaches without vegetation. Water levels are the most significant factor that change the waterfront experience. Figure 1 shows how the Lake Huron water level has change over the last 100 years. During the 1960s, levels were the lowest on record, but only for a short duration. At that time, there were wide beaches, but the vegetation had not had a chance to appear before high water returned. High levels ensued for the next three decades peaking in 1986, so wave impacts kept the vegetation at bay. From the mid 1990's onward to 2013, below average lake levels have resulted in wide beaches providing the opportunity for coastal vegetation to expand. The concern for many users of the waterfront is that the vegetation will grow to the water's edge eliminating the beach entirely. After 2013 and into 2019 water levels began to rise rapidly reducing beach width and disturbing shoreline vegetation resulting in significant change once again on the beach. The wave action will always maintain a beach of varying width depending on how much ice and storm activity have occurred during the off season. In order to accommodate all users of the waterfront, the Municipality will have to play a role to ensure that beach space is optimized.

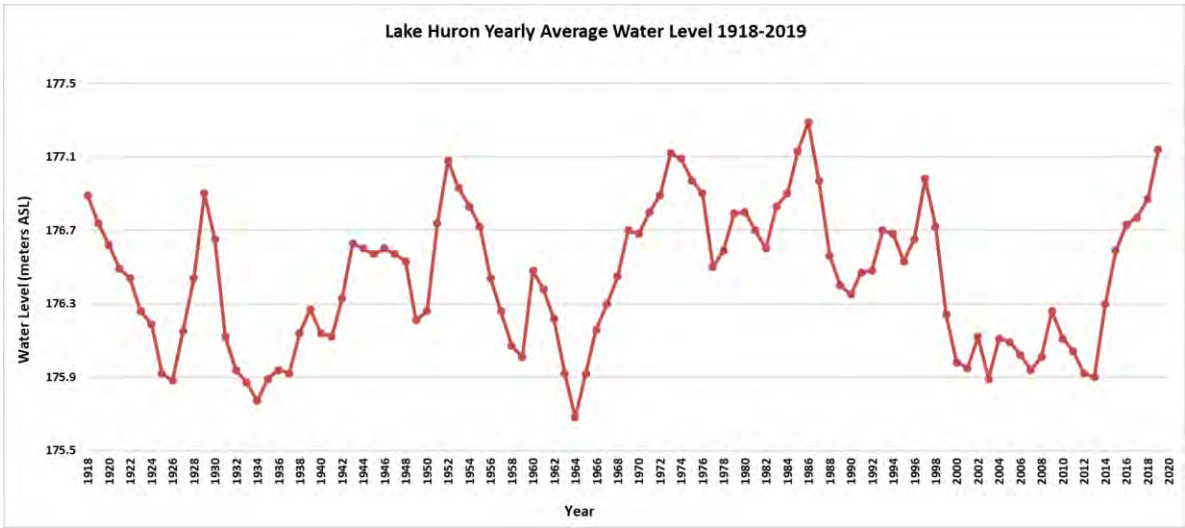


Figure 1: Hydrograph showing historical water levels on Lake Huron 1918-2019.

The following two sections have been taken from publications of the Lake Huron Centre for Coastal Conservation.

Beach Processes

Sand is continually being eroded and deposited on the shore by waves. Storm waves will erode the beach, taking the sand offshore, and forming a sand bar. The sand bar acts as a temporary protective berm, absorbing wave energy that would otherwise reach the shore causing even more erosion. Once the storm subsides, gentle waves will gradually bring the sand from the sand bar back to the shore and re-deposit it on the beach. Once onshore, the sand is then prone to movement by wind.

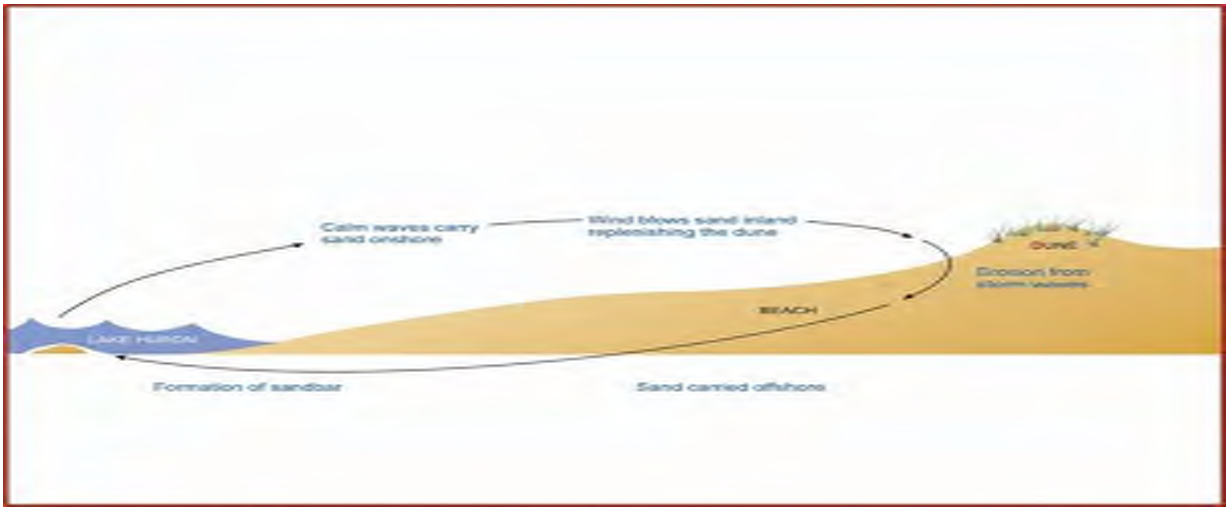


Figure 2 showing the “Sand Cycle”. Windblown sand collects forming a dune, waves (especially in storms and high water levels) will erode the dune carrying the sand lakeward to form sand bars which protects the beach. Gentle waves gradually move sand onshore to be carried by wind back to the dunes.

Dunes form when sand is carried by the wind from the beach towards the land. Sand particles begin to move when wind velocity reaches about 20 kph. The smallest particles (0.05-0.15 mms. in diameter) are so tiny that they float in the air: this is known as **suspension**. Slightly larger particles (0.15 -0.25 mms. In diameter) move in a hopping motion known as **saltation**. The energy of the falling grains may not be completely absorbed on impact and may therefore rebound. This may cause another particle to jump or may push a larger grain (0.25 -2 mms. in diameter) forward. These larger grains are continually bombarded by saltation and being pushed forward: this is known as **sand creep**. Although most sand particles are moved by saltation, surface creep may account for 20-25% of the moved sand (Bagnold, 1954). Most of the sand is carried within 0.15 m (6 inches) of the ground surface. The very fine sands light enough to be carried by suspension are usually carried well outside of the active dune system.

Onshore winds will dry the sand and selectively pick up the smaller grains of sand (0.08 - 0.5 mm) and move them towards the land. Sand grain sizes in dunes are typically finer than those on beaches. This is important because fine sand deposits have greater capacity to retain water than coarse sands and are therefore more suitable for vegetation growth. Moist sand is moved less easily by the wind than dry sand since moisture causes sand particles to stick together. The wind strength that is needed to initiate sand movement is higher for moist sand. While wind strength is important, the quantity of sand moved is also influenced by how long the wind is blowing from a particular direction. Wind duration is an important consideration, and knowing the prevailing wind directions at certain times of the year can help with determining management strategies for dune conservation and restoration efforts. Winds from the west and southwest are perhaps the most influential in the movement of sand along the shores within the Municipality of Kincardine.

As well as wind speeds and duration, water levels play a significant role in how much sand transportation will take place. During high water levels, more of the beach is submerged and the width of dry beach is less. As a result, less of the beach is exposed to wind erosion. Conversely, during lower water levels, more of the beach is exposed and greater wind erosion of the beach is possible. Therefore, periods of dune building tend to occur during lower water levels. Periods of natural dune erosion tend to occur during high lake levels when storm waves erode the base of the dune and carry that sand to offshore bars. What is fundamental to understand is that sand dunes and beaches must be managed as one system. Dunes depend on beach sand for their formation, particularly during low water level periods, and beaches need the sand reserve held in the dunes during high lake levels and storm events.

Beach Management – *the basics*

In recent years up until 2013 we have experienced a period of lower than average water levels on Lake Huron. This has resulted in much wider beaches. This period of low lake levels has given rise to the migration of dune vegetation (particularly Marram grass) toward the lake. This is a natural process which should not be disturbed. This plant migration allows the dune to develop outward and build up its sand reserve. When plants are removed or damaged, the dune tends to build upwards, often obstructing views of the lake.

The lakeward expansion of dune vegetation during low lake levels helps the beach to retain sand (reducing wind erosion), and slows the dune building process, effectively allowing certain rare dune species to establish populations. A return of higher lake levels will cause erosion of the dune and return sand to the beach and nearshore. Maintaining this sand cycle preserves high quality beaches.

Beach and dune systems are best managed by not interfering with the natural processes, but instead accepting that wave erosion will occur during periods of high lake levels, and wind erosion and sand deposition will be more prevalent during low lake levels. Working with natural lake processes, rather than at odds with them, provides a wide range of advantages, including ecological, economic and public health benefits. Beaches and dunes are dynamic environments and physical change occurs normally and with regularity. Mechanical beach grooming is a

practice that some municipalities undertake in order to achieve a certain aesthetic. One of the problems with beach raking is that it can interrupt natural processes such that the end result is a compression of the dune (the dune isn't allowed to expand in response to lower lake conditions) and the dune will grow vertically, rather than laterally. This will eventually lead to sightline obstructions, mobility issues for people travelling over the dune to the beach, and sand drifting issues. If raking is done at all, it should be confined to the lower beach area near the water and well away from the leading edge of the dunes.

Species at Risk

Endangered species, such as Piping Plover and its habitat are protected under the provincial *Endangered Species Act 2007 (ESA)* and the federal *Species at Risk Act (SARA)*. These statutes protect the areas Plovers require to carry out their life processes including breeding, nesting, feeding, foraging and areas required for rearing their young. The ESA protects habitat by prohibiting activities that would damage or destroy the features and functions present in that area. The most important protected habitat for Piping Plover is considered in the vicinity of nesting birds. In this area the Ministry of Natural Resources and Fisheries (MNRF) regulates activities including beach raking or other activities that would damage the habitat. These activities take place prior to the birds' arrival and while breeding territories are defined, potential nests are established and the species has carried out is life processes on the site. Natural material such as sticks, driftwood and vegetation are important and necessary habitat components on which Plovers rely for their survival. Beach raking removes these features and can damage the habitat. However the removal of human garbage is required to be carried out on a regular basis. After the Plovers have left the breeding habitat for the season, certain levels of beach maintenance can be considered acceptable. The Municipality is obligated to consult with MNRF for advice on how to proceed to ensure no damage occurs to the features and functions of the protected Plover habitat.

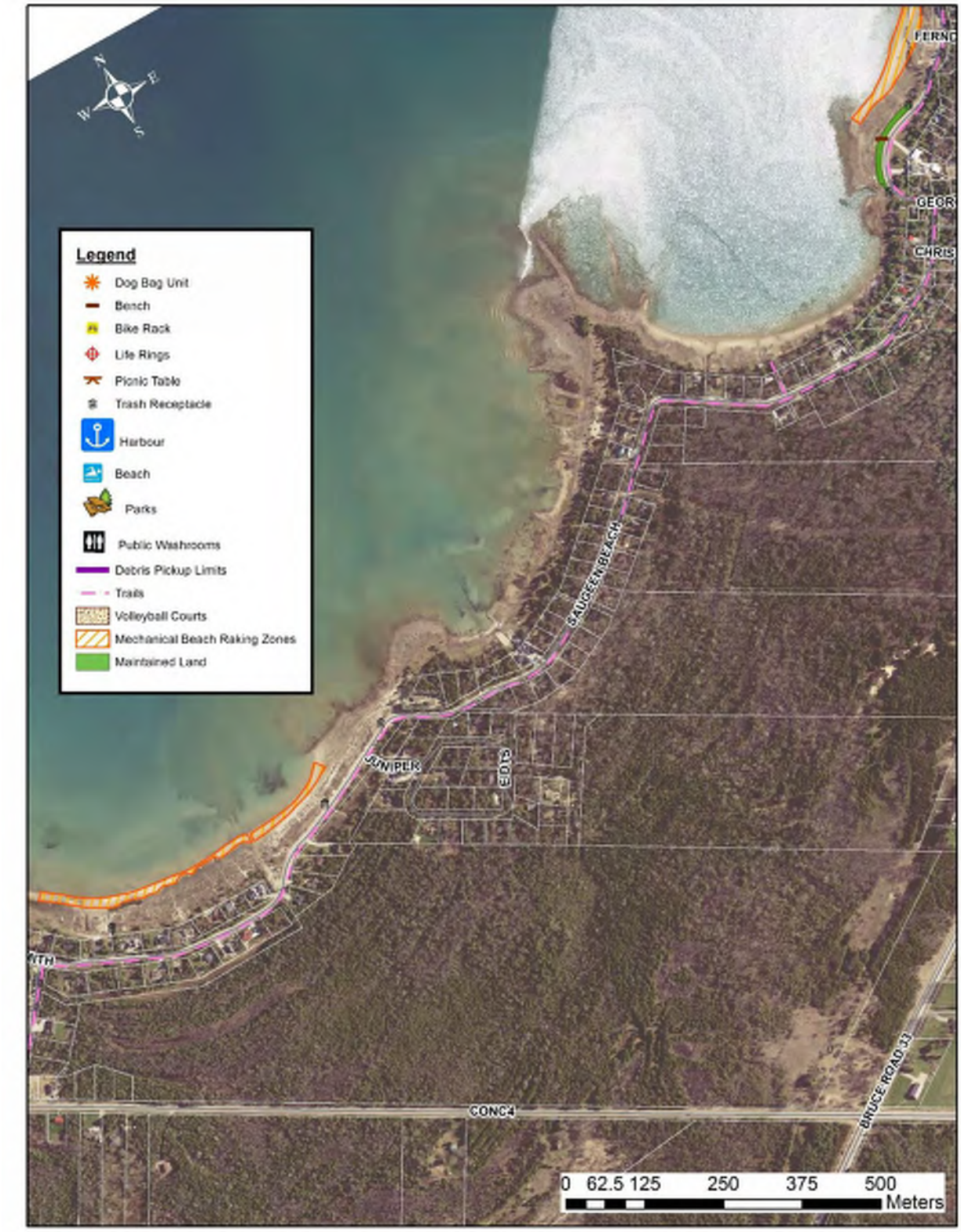
Activities Defined

This document will describe 19 activities that are conducted on the waterfront throughout the course of the year. Refer to the maps and tables for each maintenance zone. The following describes each of the activities.

1. **Garbage Collection** – the collection of garbage from municipal cans strategically placed along the waterfront. It is important to note that not all garbage receptacles are distributed at the same time. Receptacles are placed based on need, a few are year round, additional receptacles are added starting in early May, maximum compliment from late June to Labour Day. After Labour Day weekend, staff begin to remove garbage cans from low traffic areas.
2. **Litter collection** – hand collection of litter that has accumulated along the waterfront. Litter is defined as human litter.
3. **Beach Grooming** – A general term to describe a beach maintenance activity. Specific types of grooming are: grading, raking and tilling which are described below.
    a) **Beach Grading** – large scale mechanical leveling of the beach surface using heavy equipment usually a road grader, dozer, loader and/or dragging with a heavy I beam. Usually done to address erosion caused by water drainage, holes created by beach visitors or undesirable beach topography such as uneven berms created by natural events (i.e. winter storms).
    b) **Beach Raking** – includes mechanical beach rakes towed by a tractor (such as a Barber Surf Rake) or manual raking by hand to “clean” the beach by collecting small debris and materials of natural (e.g. sticks, vegetation) and human (e.g. litter) origin. The materials are them removed from the beach and deposited in the landfill.
    c) **Beach Tilling** – using a roto-tiller or cultivator, the beach surface is broken up to soften hard packed sand and discourage vegetation growth.
4. **Debris Removal** – the removal of larger natural debris such as logs or large qualities of detritus (fine, black, organic material and “seaweed”) that collects on shoreline. It can include larger human debris as well (large litter). Debris pickup is normally completed by hand and/or using mechanical equipment (loader).
5. **Grass Cutting** –this is typically evident in areas along the roadway at designated beach access points.
6. **Parking Lot Maintenance** –parking lot grading frequency is determined in the subject destination.
7. **Washrooms** – strategically placed facilities along the waterfront with scheduled cleaning procedures.
8. **Water Quality Testing** – swimming beach water quality testing conducted in collaboration with the Grey Bruce Health Unit (GBHU) completed in the subject destination during the designated season. Results are posted on the Health Units website.
9. **Playground** – playground structures located along the waterfront for the enjoyment of users.

10. **Beach Access Points** – public accesseto the beaches that include municipally owned and maintained accesses as well as those future accesses that are not currently maintained.
11. **Rope and Post** – wood posts joined by rope to define a specific area which assists in pedestrian flow and protection of sand dunes.
12. **Boardwalks/sidewalks/trails/promenades** – harden surfaces which assist with pedestrian flow to a destination. This can include “roll-away” boardwalks which can be removed if required (i.e. high water).
13. **Snow fencing** –snow fences installed and in what configuration and location in the subject destination to reduce sand migration.
14. **Dunes** - a hill of sand built by either wind or water flow.
15. **Common Reed** (also known as Phragmites) – a tall grass (can be 2 meters plus in height) similar in appearance to cattails that is an aggressive invasive species that can colonize and choke out other species. It prefers wetlands and shoreline habitat. Herbicides are used to control this species at specific locations when not located in the water.
16. **Washouts and minor grading for holes** – washouts and or holes in the sand repaired in the subject destination. Degree of washout will determine the process for repair (see beach grading).
17. **Inspections** – A regular, focused and documented review of equipment and facilities by staff within the specified area of the waterfront.
18. **Stormwater/Creek Maintenance** –the storm water outlet crossing the beach from an inland source maintained and repaired in the subject destination.
19. **Lifesaving Stations** – located along the waterfront that includes ring buoy, reaching pole and educational signage.

Maintenance Zone 1 – Saugeen Beach



Maintenance Zone 1 begins at Smith Lane and follows the waterfront to George Street. This particular area is comprised of a number of different elements from rocky points to shallow sandy beaches. Grasses and wetlands jot the landscape along beach entry points in the middle portions.

It is an attractive area that has had limited access points with well used beaches by the residents and cottagers within the area. Very little is done in the means of maintenance by the Municipality, unless otherwise requested.

Activity	What is Provided	Additional Notes
1. Garbage Collection	✓	Limited number of garbage cans is in this zone. Additional garbage cans can be provided if there is a special occasion that has been arranged with staff.
2. Litter Collection	✓	Bi-weekly litter sweeps will occurs in July and August
3. Beach Grooming	✓	Specific sections of the beach (see maps) will be groomed using mechanical beach raking and tilling 4 times per year (generally during the week preceding the long weekends from Victoria to Labour Day. Hand raking occurs as required.
4. Debris Removal	X	Very little debris comes ashore in this area. Major debris will be removed as required.
5. Grass Cutting	✓	Grass is cut in the area of George Street, which a number of citizens utilize as an area to launch vessels.
6. Parking Lot Maintenance	X	A basic 6 car lot is available adjacent 35 Saugeen Beach Road. On-road parking is accommodated.
7. Washroom	X	No washroom or port-a-pottie is located in this destination.
8. Water Testing	X	
9. Playground	X	
10. Beach Access Points	✓	12 Access points exist. In 2018, signs were improved and added.
11. Rope and Post	✓	Inspected pre-season and replaced as required. Weekly monitoring occurs in July and August.
12. Boardwalks/Sidewalks/Promenades	✓	Juniper Area has historically had board walks for patrons to get over the grasses. A boardwalk in

		maintained adjacent parking lot at 35 Saugeen Beach Rd.
13. Snow Fencing	X	
14. Dunes	✓	High quality but small dunes exist in this area. They will be protected from development and grooming damage.
15. Common Reed	✓	Some is present and will be controlled with herbicides where possible.
16. Washouts & Minor Grading of Holes	X	Limited washouts are controlled naturally.
17. Inspections	✓	
18. Creek Maintenance	✓	As required
19. Lifesaving Stations	✓	2 were placed 2019

Maintenance Zone 2 – Gobles Grove

Maintenance Zone 2 begins at George Street with a natural shallow water area with non-maintained access ramp and concludes at Bruce Road #25. Gobles Grove is a well-used beach by residents and cottagers within the area, and also as a major destination for day users.

The area is experiencing an increasing number of full time residents that are passionate about the sustainability of the waterfront. Continued partnerships with groups such as the Saugeen Beachers' Association continue to improve the aesthetics of the area.

High water has made this beach very narrow in recent years.

Activity	What is Provided	Additional Notes
1. Garbage Collection	✓	Pick up every day including twice a day on Fridays, Saturdays and Sundays. A minimum of 6 cans in total at Gobles Grove and 2 cans south to George Street. Cans are distributed mid-May until October. Garbage collection is reduced during the off season to three to four times a week.
2. Litter Collection	✓	Picked up every day in July and August. Service not provided during the off season, however community groups will sometimes provide a beach clean-up day in partnership with the Municipality.
3. Beach Grooming	✓	Specific sections of the beach (see maps) will be groomed using mechanical beach raking and tilling 4 times per year (generally during the week preceding the long weekends from Victoria to Labour Day. Hand raking as required.
4. Debris washed up on shore	✓	Very little debris comes ashore in this area, it will be removed as required.
5. Grass Cutting	✓	Grass cut around post and ropes every second week and road side along the George Street area during July and August. It is completed weekly around the washroom facility. Grass is cut as required during the shoulder season due to reduction of seasonal staff and slower growth rate.
6. Parking Lot Maintenance	✓	One or two times per year as required.

		Parking area is well compacted and requires infrequent grading. New drainage improvements have been completed.
7. Washroom	✓	Gobles Grove washroom is opened beginning of May and closes the end of October (dependent on weather). It is cleaned multiple times a day during July and August. During the off season it is inspected regularly and cleaned as required.
8. Water Testing	✓	Monthly by the GB Health Unit
9. Playground	✓	One playground unit located at Gobles Grove Washrooms. Inspected once a month, 12 months of the year.
10. Beach Access Points	✓	The most populated access point remains the main beach at Gobles Grove within this destination.
11. Rope and Post	✓	Is inspected pre-season and replaced as required. Continued monitoring occurs throughout the season.
12. Boardwalks/Sidewalks/Promenades	✓	A minimum of one wooden boardwalk to get patrons to the waterfront. Smaller additional boardwalks to assist patrons traveling from their vehicle over wet areas on the beach. Inspected and maintained on a weekly basis. In 2019 high water has forced removal of most.
13. Snow Fencing	✓	One row from CR 25 to creek near washrooms.
14. Dunes	X	Limited dune growth due to wet sand conditions reducing sand migration. Consideration could be given to planting dune grass to assist in capturing what little sand does migrate and to begin to build up an acceptable sand base. Would include stand fencing to be established for two years, which may not be agreeable to residents within the vicinity.
15. Common Reed	✓	As required and permitted.
16. Washouts & Minor Grading of Holes	✓	
17. Inspections	✓	

18. Creek Maintenance	✓	As required. Creek at washroom receives a higher level of service.
19. Lifesaving Stations	✓	Lifesaving stations are present.

Additional Notes:

Concerns from some citizens regarding growth of vegetation and that it had been progressively growing Lakeward for several years. Under low Lake conditions, the natural response is for vegetation to grow into open sand areas where competition is low. The vegetation growth is all native species, predominately rushes and sedges. This type of vegetation is common on low gradient, naturally wet beaches, like Gobles Grove. Recent high water has removed most of this vegetation.

Stormwater outlet near CR 25 - After rainfall events, Town staff will visit the site to review the condition of the outlet. If significant amounts of sediment are collected in the plunge pool, or rip rap has been transported out of the plunge pool, equipment will be mobilized to repair. Semi-annual inspections will be carried out, in early spring and late fall. The spring inspection will review the condition of the outlet in preparation of the summer season and initiate any require maintenance. The fall inspection will ensure the outlet is secured for the winter and will recommend any repairs or protection for the season. Dune grass is recommended to be considered in this area, the installation of the outlet provides for the opportunity to install grasses and will be incorporated into the final detailed design. This dune grass will then be maintained per the Plan.

Maintenance Zone 3 – The Sands of Shipley

Maintenance Zone 3 historically had limited maintenance. Cottages abut to the high water level mark and some residents prefer the 'less is more' attitude along this piece of shoreline. Dunes have started to form during the low water duration and vegetation has started to grow closer to the water's edge.

Some citizens have conducted their own maintenance in front of their properties and incorporated into their own landscaping. Users of the beach within this vicinity get the sense that this is private beach and prefer to patronize the more populated beaches.

Amenities such as garbage, litter collection and washrooms are not available in this destination.

Activity	What is Provided	Additional Notes
1. Garbage Collection	X	
2. Litter Collection	X	
3. Beach Grooming	X	
4. Debris Removal	X	No debris clean up within this vicinity.
5. Grass Cutting	X	
6. Parking Lot Maintenance	X	No parking lots, with only limited parking at the beach access points.
7. Washroom	X	No washroom or port-a-pottie located in this destination.
8. Water Testing	X	
9. Playground	X	
10. Beach Access Points	✓	Some access points remain inaccessible, while others have signage and bollards to reduce motorized vehicles from accessing. New signs were added in 2018.
11. Rope and Post	X	
12. Boardwalks/Sidewalks/Promenades	X	
13. Snow Fencing	X	
14. Dunes	✓	Have naturally started to form.
15. Common Reed	✓	Some is present and will be controlled with herbicides where possible.

16. Washouts & Minor Grading of Holes	X	Limited washouts are controlled naturally.
17. Inspections	X	
18. Creek Maintenance	✓	As required. South end drain outlet receives higher level of service.
19. Lifesaving Stations	X	

Additional Notes:

Historically, the Municipality has had limited issues with this particular destination except in extreme cases when beach users have been told it is a private beach (it is all public).

Maintenance Zone 4 – Port Elgin Main Beach

Maintenance Zone 4 destination commences south of the Izzard Road lookout at 538 Izzard Road and encompasses the beach northward to and including the North Shore Park. Considered to be the busiest of all the beaches in Saugeen Shores, it is a major tourism attraction. The soft sands and shallow waters are appealing for families, and the restaurant amenities provide eating establishments.

This beach tends to be a very wet beach due to the low grade and the impact of historic and continued grading. Grading has been desired by citizens residing in the area for aesthetic purposes. The continued grading of the beach removes the upper layer of sand and contributes to the rising of the water table. Measures such as planting of beach grasses have had a positive impact to the north side of this beach, but this has also contributed to ongoing maintenance. The increase of sedges and rushes has caused some displeasure to some users of the beach.

Staff is experiencing an increase in the amount of debris being washed up along this portion of the beach, which has added obligations to the staff complement. This substance (which is a common form on Southampton beaches).

Activity	What is Provided	Additional Notes
1. Garbage Collection	✓	Cans are distributed mid-May until October. In mid summer pick up every day (at least 2X) twice a day on Fridays, Saturdays and Sundays (`20 cans) Garbage collection is reduced during the off season to three to four times a week.
2. Litter Collection	✓	Litter is picked up by the waterfront crew every morning. This service is only available during July and August. Pitch-in week, which is offered in April, promotes volunteers to assist with beach litter clean up and historically a group from Saugeen District Secondary Schools coordinates a beach cleanup in September.
3. Beach Grooming	✓	The beach is groomed daily as required. Mechanical raking will occur up to 4 x per season, hand raking occurs at other times. See maps.

4. Debris Removal	✓	Debris removed as required by hand or equipment. Checked daily in July/August.
5. Grass Cutting	✓	Grass is cut weekly during the summer months in front of the Beach House Washrooms (bottom of Green Street), around the harbour green and into North Shore Park. Grass cutting is less frequent in the fall months. See maps.
6. Parking Lot Maintenance	✓	Grasses in parking lot and around parking barriers cut as warranted. Edge promenade once a month. Grading is completed as required. Currently low level of service is offered. ***Increase in grading of the parking lot should occur to ensure an acceptable surface.***
7. Washroom	✓	Beach House washroom cleaned 5 to 6 times a day during the months of July and August. Fish Cleaning washroom cleaned twice a day. Harbour Washrooms cleaned twice a day, reduced during the shoulder season. Staff periodically inspects washrooms throughout the day and will clean accordingly.
8. Water Testing	✓	Monthly by the GB Health Unit
9. Playground	✓	Inspection of playground equipment on the Port Elgin Main beach occurs monthly year round.
10. Beach Access Points	✓	Beach access points are all maintained in this destination and are considered main entrances to the beach. Signs have been added and improved.
11. Rope and Post	✓	Rope and post depicts areas that are sensitive in nature and assist in flow of patrons to the waterfront. The rope and post is

		inspected pre-season and during the summer season.
12. Boardwalks/Sidewalks/Promenades	✓	Boardwalks installed to assist with accessibility (some removed due to high water in 2019). The promenade is swept once a week as part of the North Shore Trail. New promenade and lookout completed in 2019.
13. Snow Fencing	✓	Two rows from harbour wall to Izzard Street. ***Town has received inquiries for additional snow fencing. High water levels are making the task difficult in some areas of the main beach.***
14. Dunes	✓	Staff will pull weeds forming in dunes on an as needed basis. Volunteers have assisted in pulling weeds, due to the large volume accumulated. This is a program that should be continued.
15. Common Reed	✓	Controlled using herbicide where possible.
16. Washouts & Minor Grading of Holes	✓	During heavy downpours water directs itself from Green Street through the parking lot and across the promenade towards the beach at the emergency entrance area. This area typically needs to be back filled when this occurs. This is completed within the area of the beach volleyball courts twice a week and limited grading between monthly beach grading as required.
17. Inspections	✓	Staff is on the beach every day commencing at 7:30 AM.
18. Creek Maintenance	✓	As required. Creek at former water treatment plant location receives higher level of service.
19. Lifesaving Stations	✓	Many station are present.

Additional Notes:

- The vicinity of the Flea Market is inspected pre-season with sand removal if required.

- The sands are generally fine textured and quite prone to wind erosion. During high Lake levels the beach is usually damp, and as a result, beach erosion decreases. During low Lake levels, the beach is not only more expansive, but the sand is drier and tends to become mobilized during windy periods.
- The Town has traditionally graded this beach mechanically for the purposes of aesthetics and to fill in holes left by children playing in the sand. The grading also had the effect of aerating and causing the sand to dry out more quickly, thereby contributing to the increased likelihood of sand erosion. Given the nature of destination 4, mechanized grading contributes to the beach erosion issue.
- Staff has become increasingly cautious about maintenance activities at the main beach. Often times residents and visitors video tape activities and do not approve of the operations. Some want additional maintenance and others less. This area has become a slightly hostile environment.
- Staff will continue to work towards a balance while keeping with provincial legislation and considering the ecological sustainability of the beach environment.

Maintenance Zone 5 – North Shore Trails

Maintenance Zone 5 starts at the north end of North Shore Park and continues to 10th Concession. Predominately shallow water, rocky points and outcrops. This portion of the waterfront is more enjoyed by those utilizing the North Shore Trail.

During low water levels, small sandy beaches formed and were utilized by patrons.

Activity	What is Provided	Additional Notes
1. Garbage Collection	X	
2. Litter Collection	X	
3. Beach Grooming	X	
4. Debris Removal	X	
5. Grass Cutting	✓	Along the road side only.
6. Parking Lot Maintenance	X	
7. Washroom	X	
8. Water Testing	X	
9. Playground	X	
10. Beach Access Points	✓	Access points are on the east side of the road leading up to North Shore Road.
11. Rope and Post	X	
12. Boardwalks/Sidewalks/Promenades	✓	North Shore Trail sweep every Friday commencing when snow leaves until Thanksgiving weekend. ***higher level of service should be provided to respond to storm event and clear trail after.***
13. Snow Fencing	X	
14. Dunes	X	
15. Common Reed	✓	Controlled using herbicide where possible.

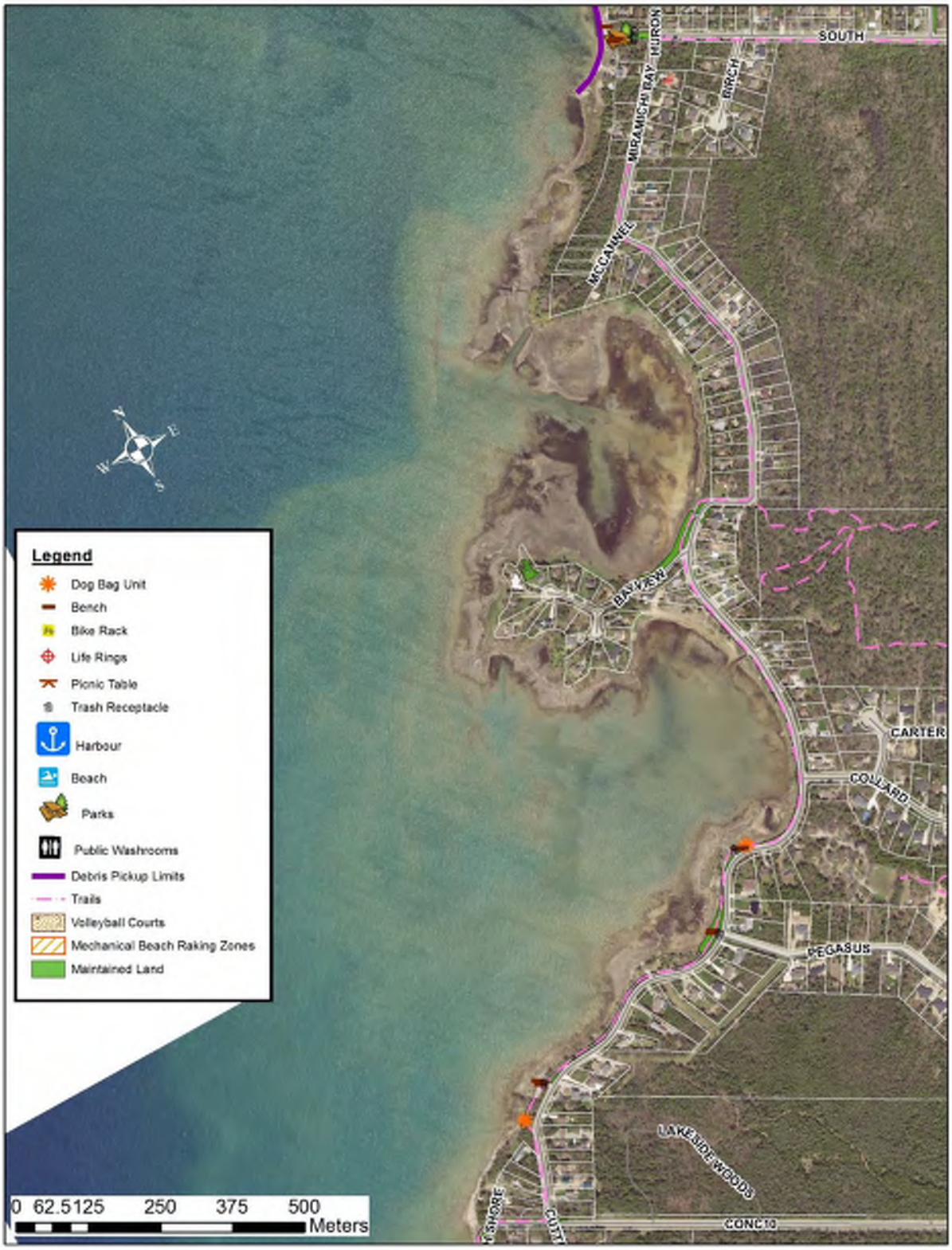
16. Washouts & Minor Grading of Holes	X	
17. Inspections	X	
18. Creek Maintenance	X	
19. Lifesaving Stations	X	

Additional Notes:

Thanks to the North Shore Trail, this portion of the waterfront is a mecca for active enthusiasts.

In 2020 high water caused significant damage to the asphalt path and some sections had to be closed. Repairs options are being considered and work is expected to require a major effort and cost.

Maintenance Zone 6 – The Bays of Horseshoe and Miramichi

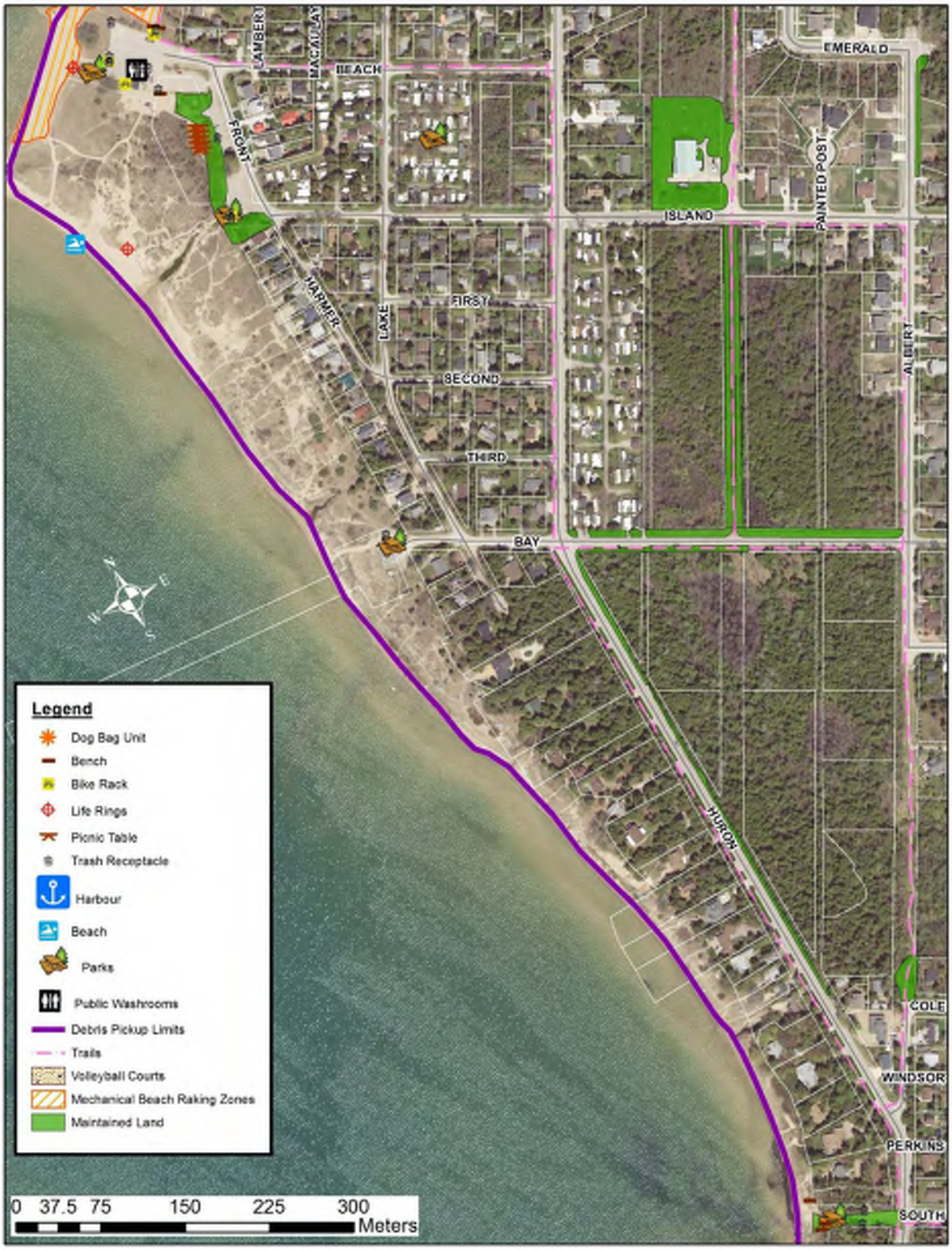


Maintenance Zone 6 is influenced by fluctuating water levels that greatly change the usage and dynamics of these two areas. Bird enthusiasts enjoy the wildlife that can easily be seen in the bays, and the lookout areas accommodate those individuals looking for a short retreat. The recent rise in the water levels has brought boating activity back into both Miramichi and Horseshoe Bay. This destination starts at the 10th Concession and concludes at South Street Beach.

Activity	What is Provided	Additional Notes
1. Garbage Collection	✓	Garbage can located north of 10th Concession and lookouts emptied daily during summer season.
2. Litter Collection	X	
3. Beach Grooming	✓	One per year on the east side of Miramichi Bay depending on water levels.
4. Debris Removal	✓	Minor cleaning for first three lots south of South Street (once per year maximum if required).
5. Grass Cutting	✓	Grass cutting is completed a minimum of every two weeks. Cut weekly at the McNabb Range Light.
6. Parking Lot Maintenance	X	Parking tends to occur in the limited parking facilities adjacent to the lookout areas.
7. Washroom	✓	One port-a-pottie located at lookout south of Pegasus Trails from early May to mid-October.
8. Water Testing	X	
9. Playground	X	
10. Beach Access Points	✓	Limited maintenance at beach access points with the exception of grading at Miramichi access point.
11. Rope and Post	X	
12. Boardwalks/Sidewalks/Promenades	✓	North Shore Trail is swept weekly commencing once the snow has melted, up to the Thanksgiving Weekend.

13. Snow Fencing	X	
14. Dunes	X	
15. Common Reed	✓	Controlled using herbicide where possible.
16. Washouts & Minor Grading of Holes	X	
17. Inspections	X	
18. Creek Maintenance	X	
19. Lifesaving Stations	X	

Maintenance Zone 7 – South Street to Beach Road



Maintenance Zone 7 starts at South Street and Beach northward to Beach Road adjacent Gerry's Fries, these beaches are small in comparison to other Southampton Beaches, however their soft sand and shallow waters are an attraction to many users.

Activity	What is Provided	Additional Notes
1. Garbage Collection	✓	Garbage cans located at entrances of South Street and Bay Street beaches. Collection occurs daily. Collected twice a day on Fridays, Saturdays and Sundays during summer months. Cans remain until mid-October and emptied minimally once per week.
2. Litter Collection	✓	Tuesdays, Fridays and Sundays
3. Beach Grooming	✓	The beach is groomed as required. Mechanical raking will occur up to 4 x per season near Gerry's Fries (see map), hand raking occurs at other times.
4. Debris Removal	✓	South St experiences very large amounts of fine black debris and is removed as required and depending on condition, can be removed daily. Goal is to have removed within 1 working day (possibly 2 if resources are required elsewhere). Debris washing up on shore at South Street is an ongoing issue and can accumulate within an hour depending on currents.
5. Grass Cutting	X	
6. Parking Lot Maintenance	✓	As required
7. Washroom	✓	Port-a-pottie provided at South Street parking lot and one at Bay Street entrance. Maintained weekly by contractor from end of June until the second week of September.
8. Water Testing	X	

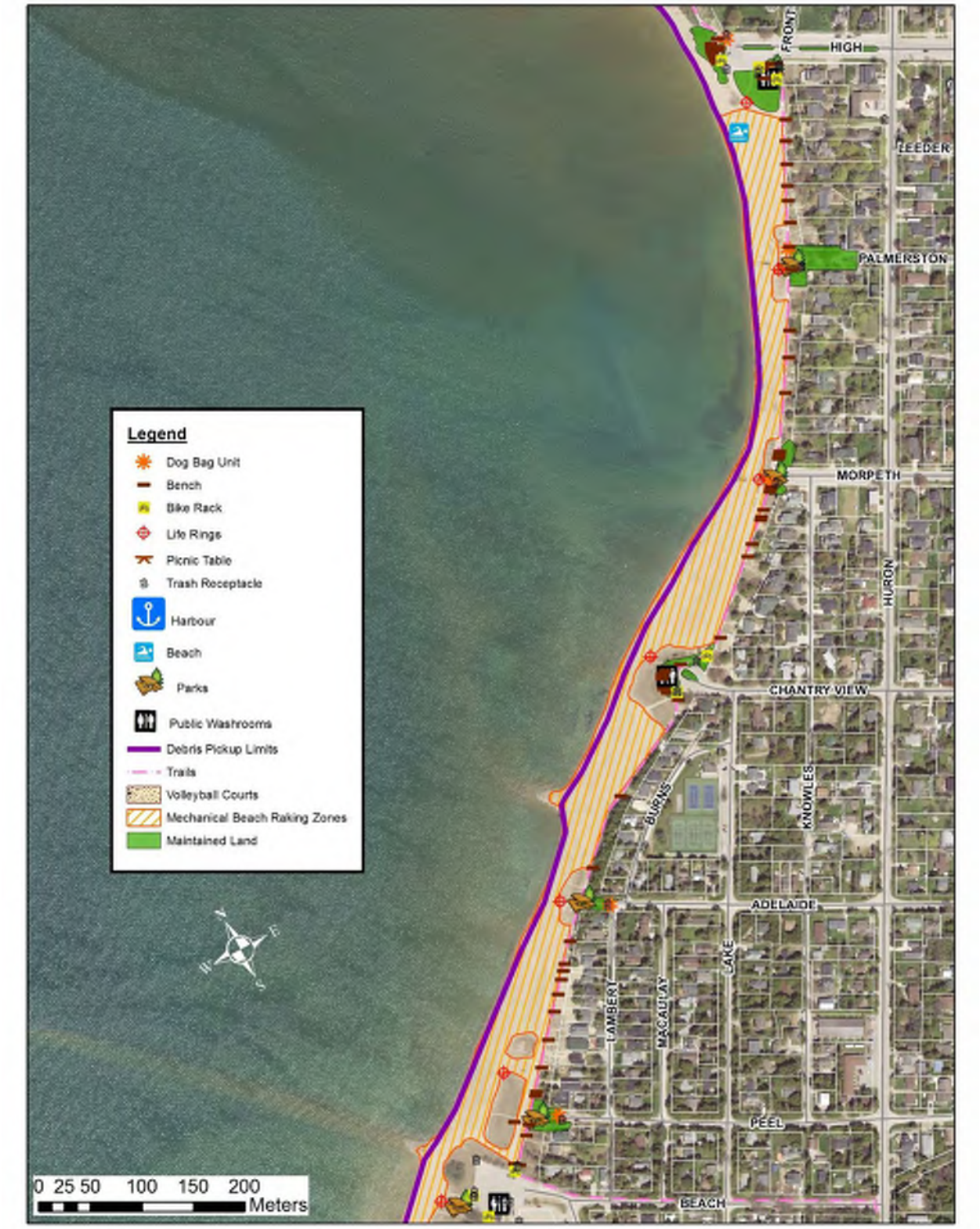
9. Playground	✓	One set of swings located at South Street which is inspected monthly from when the snow melts in the spring until removal of the swings in late fall.
10. Beach Access Points	✓	Signage indicated no dogs permitted on the beach and the amenities of what is on the beach
11. Rope and Post	X	
12. Boardwalks/Sidewalks/Promenades	X	Remnants of an existing sidewalk from Island Street to Bay Street. This is not maintained by municipal staff.
13. Snow Fencing	✓	Plywood wall across beach entrance at South Street entrance.
14. Dunes	✓	Significant dunes within the Harmer Street area. Residents continue to cut out walkways to access the beach.
15. Common Reed	✓	Controlled using herbicide where possible.
16. Washouts & Minor Grading of Holes	✓	Minor grading is completed when water levels are high
17. Inspections	✓	Daily inspections for debris during summer months from South Street to first creek northerly.
18. Creek Maintenance	✓	As required.
19. Lifesaving Stations	✓	

Additional Notes:

Due to winds, currents, the situation of the Island and Saugeen River, this destination has the highest accumulation of debris deposited on the shoreline of all areas currently maintained which utilizes significant resources.

Changing water levels annually define grading activities. With higher water levels grading is reduced due to the area available. When water levels are high, more grooming occurs and is focused on the South Street beach area. With lower water levels grading can be accommodated and depending on the beach width can go from South Street to Island Street with on width of the drag.

Maintenance Zone 8 – Beach Road to High Street



Maintenance Zone 8 area of waterfront is a draw for many users in Southampton. Its close proximity to the downtown makes it a desirable destination. Its accessible beach access points are an attraction for those wishing to walk the sidewalk to watch the sunset or to sit on the many benches.

Activity	What is Provided	Additional Notes
1. Garbage Collection	✓	Garbage cans are distributed in May along all beach access points. During summer month's cans are emptied daily. During the shoulder season, cans are emptied a minimum of four times a week. Cans are also located along the sidewalk on the beach. Cans are removed late fall.
2. Litter Collection	✓	Staff inspect beach for litter three times a week. (Tuesday, Friday and Sunday)
3. Beach Grooming	✓	Large sand accumulations around snow fences and at sidewalk areas. Late May early June a dozer is used on beach to level off wind-blown sand and level out beach. Beach is mechanical raked up to four times per year. See maps.
4. Debris Removal	✓	Is extensive in spring. Completed as required and sometime takes until mid-June to complete
5. Grass Cutting	✓	Available at access points.
6. Parking Lot Maintenance	✓	Calcium sprayed in May on Island Street Parking lot. Depending on weather, second calcium treatment may be applied. Graded as required.
7. Washroom	✓	Washrooms are cleaned twice a day at Gerry's Fries, Chantry View and Millard Blvd, more during busy times.
8. Water Testing	✓	Monthly by the GB Health Unit

9. Playground	✓	Inspections conducted once a month. Playgrounds include Island Street, Long Dock, Palmerston, Adelaide, Morpeth and Peel.
10. Beach Access Points	✓	Signage for users to walk bikes as well as no dogs on the beach. Garbage cans are located at the beach access points. Sand that has accumulated is pulled back out of the Chantry Dune trails. This is completed every second year. Extensive sand accumulates within the Chantry Dunes pathways and viewing platform.
11. Rope and Post	✓	Situated around the existing dune grasses. Inspection of these areas occurs pre-summer annually.
12. Boardwalks/Sidewalks/Promenades	✓	Weekly sidewalk sweeping commences once the snow has been removed up to Thanksgiving Weekend. Boardwalks added in 2019
13. Snow Fencing	✓	A permanent sand fence has been installed at the platform at Chantry Dunes and at Morpeth Beach Access. 2 rows across the end of High Street (depending on water levels). 1 row from High Street to long dock. 2 rows at Chantry view drive – one on either side of washrooms. Plywood wall across the beach access point at Morpeth Street.
14. Dunes	✓	
15. Common Reed	✓	Controlled by herbicide where possible.
16. Washouts & Minor Grading of Holes	X	
17. Inspections	✓	

18. Creek Maintenance	✓	As required. Outlets at Morpeth and Palmerston receive a higher level of service.
19. Lifesaving Stations	✓	Stations added in 2018

Additional Notes:

Individuals riding their bicycles along the sidewalk continues to be an issue within this destination. Decals and signs have been erected to assist in policing this area. Dogs are permitted to be walked on the sidewalk only. These sign changes are more in keeping with the existing by-law.

Maintenance Zone 9 – High Street to Saugeen River

Maintenance Zone 9 area comprises the area north of the flag in Southampton. The landscape changes considerably in this portion from a sand beach to a pebble beach with walking trails. This natural portion of the beach is enjoyed by many seeking a relaxing alternative to a sandy busy beach. A new pathway has assisted in opening up a portion of the waterfront to additional usage, and now boasts the first butterfly gardens within the area. In 2019 and 2020 high water radically changed this section and the gravel berm, pond area and the southern section of the Captain Spence Path has been completed consumed by Lake Huron raising water levels.

Activity	What is Provided	Additional Notes
1. Garbage Collection	✓	Garbage cans located at the flag, entrance of the Captain Spence Path and at Pioneer Park. During summer months garbage is picked up daily. In the shoulder season this is reduced to a minimum of four times a week.
2. Litter Collection	X	
3. Beach Grooming	X	
4. Debris Removal	✓	Completed once per year in the spring for logs and other debris deposited during winter months.
5. Grass Cutting	✓	At Millard Blvd. washroom, as well as the entrance of Captain Spence Path and cutting back the weeds along the path. Pioneer Park area is cut by volunteers.
6. Parking Lot Maintenance	✓	Grading as required very infrequent
7. Washroom	✓	Cleaned twice a day at Tour Base Station.
8. Water Testing	X	
9. Playground	X	
10. Beach Access Points	✓	
11. Rope and Post	X	
12. Boardwalks/Sidewalks/Promenades	✓	Captain Spence Path starts at the Flag and ends at Pioneer Park. A natural setting through

		wet meadows and butterfly gardens. High water has damaged the Captain Spence Path, it cannot be repaired until the water recedes.
13. Snow Fencing	✓	One row in front of Pioneer Park.
14. Dunes	X	
15. Common Reed	✓	Controlled by herbicide where possible.
16. Washouts & Minor Grading of Holes	X	
17. Inspections	X	
18. Creek Maintenance	✓	As required.
19. Lifesaving Stations	✓	At Southampton harbour

Additional Notes:

The Captain Spence Path is a well-used path in natural settings. Staff will need to be cognizant of the rising water levels and the impact it may have to the beach. This will be a particular concern over winter months.

Maintenance Zone 10 – Scubby's Point and the Northern Sands

Maintenance Zone 10 includes the River mouth that is a popular destination for individuals who fish. It is an ideal location for watching the sunset on a warm summer's day. Further north, there is a mixture of rocky beach entrances as well as small patches of sand beaches.

Activity	What is Provided	Additional Notes
1. Garbage Collection	✓	At Scubby's Point and at the donut. During summer months garbage is picked up daily. In the shoulder season this is reduced to a minimum of four times a week.
2. Litter Collection	X	
3. Beach Grooming	X	
4. Debris Removal	✓	Only at access points
5. Grass Cutting	X	Weekly at Scubby's Point.
6. Parking Lot Maintenance	✓	Limited areas to park vehicles. Limited grading at Scubby's Point parking facility
7. Washroom	✓	Port- a- pottie available at the donut below Scubby's Point.
8. Water Testing	X	
9. Playground	X	
10. Beach Access Points		Beaches are primarily used by residents within the vicinity walking/biking to their destination. Signs added in 2018
11. Rope and Post	X	
12. Boardwalks/Sidewalks/Promenades	X	
13. Snow Fencing	X	
14. Dunes	X	
15. Common Reed	✓	Controlled by herbicide's where possible
16. Washouts & Minor Grading of Holes	X	
17. Inspections	X	

18. Creek Maintenance	✓	As required
19. Lifesaving Stations	✓	Lifesaving station at Scubby's Point

Additional Notes

The area residents frequent these beaches on a regular basis within the rocky shoreline. Areas of white soft sand can be found.

Appendix

Ministry of Natural Resources and Forestry

Midhurst District Office
2284 Nursery Road
Midhurst, ON L9X 1N9
Tel: 705-725-7500
Fax: 705-725-7584

Ministère des Richesses naturelles et des Forêts

Bureau de district de Midhurst
2284, rue Nursery
Midhurst, ON L9X 1N9
Tél: 705-725-7500
Téléc: 705-725-7584

Ontario

Town of Saugeen Shores
600 Tomlinson Drive
Port Elgin, Ontario N0H 2C0

July 21, 2015

Dear Mayor Smith and Members of Council:

RE: Piping Plover Habitat and the *Endangered Species Act 2007*

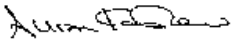
The Ministry of Natural Resources and Forestry (MNRF) would like to thank the Town of Saugeen Shores for their continued support of the Piping Plover program. With the cooperation of the Town, the endangered Piping Plover successfully nested and fledged four chicks in Port Elgin during 2014. Port Elgin is one of only five nesting sites for Piping Plover in the Great Lakes in Ontario. The collaborative efforts to protect this species on local beaches contribute significantly to the greater international recovery effort.

As an endangered species, Piping Plover and its habitat are protected under the provincial *Endangered Species Act 2007* (ESA) and the federal *Species at Risk Act* (SARA). These statutes protect the areas plovers require to carry out their life processes including breeding, nesting, feeding, foraging and areas required for rearing their young. The ESA protects habitat by prohibiting activities that would damage or destroy the features and functions present in that area. The protected habitat for Piping Plover is considered to be generally one kilometre centered around a nest. In this area MNRF provides that no beach raking or other activities that would damage the habitat take place prior to the birds' arrival and while breeding territories are defined, potential nests are established and the species has carried out its life processes on the site. Natural material such as sticks, driftwood and vegetation are important and necessary habitat components on which plovers rely for their survival. Beach raking removes these features and can damage the habitat. It is recognized that human garbage and some large debris may need to be removed as they could pose a risk to human health and safety. After the plovers have left the breeding habitat for the season, certain levels of beach maintenance may be acceptable. However, landowners should consult with MNRF for advice on how to proceed to ensure no damage occurs to the features and functions of plover habitat.

The protection of Piping Plover involves the cooperation of many parties. The Town of Saugeen Shores and the Port Elgin community should be commended for supporting activities that protect the species and its habitat and conserve sensitive beach ecosystems. MNRF looks forward to working in partnership with the Town towards improving ecosystem health in the future and is available to meet with staff as necessary to discuss the protection of this species and its habitat.

Please do not hesitate to contact me for more information.

Sincerely,



Allison Kershaw
Resource Management Supervisor (A)
Ministry of Natural Resources and Forestry
Midhurst District

References

Beach & Dune Guidance Manual for Saugeen Shores
Prepared by the Lake Huron Centre for Coastal Conservation, 2003

Chantry Dune Study
Town of Saugeen Shores, February 2015

Gobles Grove Beach
Comments Regarding Beach Grooming
Geoff Peach Site Inspection Report, August 26, 2010

Position Paper on Mechanical Beach Grooming
Prepared by the Lake Huron Centre for Coastal Conservation, 2011

Ministry of Natural Resources and Forestry
Letter to Mayor Smith and Members of Council
Re: Piping Plover Habitat and the Endangered Species Act 2007
July 21, 2015

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, Fax 519-367-3041, publicinfo@svca.on.ca, www.svca.on.ca

SENT BY E-MAIL ONLY (kara.vanmyall@saugeenshores.ca)

July 22, 2021

The Corporation of the Town of Saugeen Shores
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON
N0H 2C0

ATTENTION: Kara Van Myall, Chief Administrative Officer

Dear Ms. Van Myall;

RE: SVCA Application for Development: Cedar Crescent Village – Third Submission
122 Elgin Street
Roll No. 411046000335300
Plan 259, Harbour Block 2
Geographic Town of Port Elgin
Town of Saugeen Shores

Saugeen Valley Conservation Authority (SVCA) staff acknowledges receipt of your letter, dated June 4, 2021, regarding the proposed Cedar Crescent Village (CCV) at 122 Elgin Street, Geographic Town of Port Elgin, Town of Saugeen Shores (TSS).

It is SVCA staff's understanding that it is the Town's intention to satisfy SVCA's concerns and "move ahead with SVCA permit approvals and detailed engineering work to meet a September construction date"; and that, the Town has authorized Shoreplan Engineering to undertake the analysis of the Goderich and Tobermory gauges as requested in SVCA's May 12, 2021, correspondence. We further understand that the Town did not authorize Shoreplan Engineering to undertake technical studies to support the reduction of the dynamic beach hazard. Both the flood hazard analysis and dynamic beach study have been requested by SVCA staff as critical information to support the Town's application for development for encroachment into Lake Huron's flood and dynamic beach hazards. Additionally, it has been communicated to the Town that both studies are required by SVCA staff to deem your application complete. As such, we have addressed each item below in response to your June 4, 2021, letter.

1. **Flood Hazard Assessment**

   As previously advised, SVCA's policies (as outlined in the Environmental Planning and Regulations Policies Manual) do not support new development within the flood hazard of the Lake Huron Shoreline. Other than approvals for shoreline protections works, SVCA has not permitted "habitable"

structural development within this hazard limit. The Town is proposing to encroach within the Flood Hazard Limit where new development and public safety will be at risk. As such, this rationale provides the foundation for an update to the Flood Hazard Limit. As indicated previously, if the Town were to amend the site plan so that the proposed development was placed at the back of the parking lot, outside of the existing Flood Hazard Limit, the updated statistical analysis would not be required.

SVCA acknowledges and appreciates that the Town did authorize Shoreplan Engineering to undertake the recommended additional work necessary to verify the Flood Hazard Limit. We look forward to receiving this report upon its completion.

2. **Dynamic Beach Hazard**

As with the Flood Hazard Limit, SVCA's policies do not support new "habitable" development within the dynamic beach hazard. Based on the site plan submitted to date, new structural development is proposed within the dynamic beach hazard as mapped by SVCA. For SVCA staff to support new development within this hazard, a technical study was requested by staff to demonstrate whether the dynamic beach hazard limit could be reduced from the limit mapped by SVCA. It is our understanding that this study has not been completed and further that the Town has not authorized this work as it is the opinion of the Town's consultant that the existing walkway is a "hardened" structure that limits dynamic beach movement.

Conversely, it is SVCA staff's opinion that the existing walkway has been impacted by wave action during recent high lake levels; and that waves and wind actively transport sand over the walkway and into the parking lot landward of the walkway. Given this activity and the lack of scientific evidence to prove otherwise, the existing walkway is not the limit of dynamic beach processes at this location. Therefore, SVCA staff cannot reduce our dynamic beach hazard mapping at this time and the proposed development continues to breach the boundaries of this hazard.

In addition to the above, SVCA staff wish to address two points of clarification noted in your June 4, 2021, correspondence.

a) Regarding evaluation of the effects of climate change as it relates to this Application, SVCA staff agree this issue was resolved in previous discussions with the Town. SVCA's review of this application will remain within the boundaries of our legislated responsibilities under Ontario Regulation 169/06 to ensure the control of flooding, erosion, pollution, dynamic beaches, and the conservation of land as it pertains to proposed development. No additional investigation into the impacts of climate change on the proposed development is required by SVCA.

b) Per your request, SVCA staff will ensure that all future comments provided to the Town are relevant to the area of development that has been submitted in the development permit application for 122 Elgin Street. Therefore, SVCA staff will not comment on the adjacent lands to the parking lot/upgrade, nor the adjacent lands walkway and recommended improvements.

While being respectful of the Town's points of clarification, SVCA staff wish to acknowledge that as an agency with expertise in finding balance between development and environmental protection, we believe that there are benefits to realigning the paved walkway and re-establishing a continuous dune system west of the

proposed development. This re-development could keep the lakeshore flood hazard west of the development as well as nourish the beach to increase resilience to periods of future high lake levels.

Effectively, a re-designed walkway (i.e., location and elevation) and dune restoration could protect the site with a combination of nature-based solutions (e.g., dune restoration) and traditional grey infrastructure (e.g., raised, and re-aligned walkway). Subject to appropriate and approved design, the flood hazard and dynamic beach limit could be re-evaluated for the post-restoration scenario. SVCA staff would be pleased to discuss this item further, should the Town consider this option as a mitigative measure for floodproofing the proposed development and increasing the width of the existing beach. Hypothetically, this restoration alternative could result in new flood hazard and dynamic beach limits that are favourable for the proposed development and increase the resilience of the beach. Plus, the application could be reviewed at a staff level as a complete submission. An amendment to your SVCA application would be necessary to include the above.

Next Steps

Should the Town choose not to consider the approach outlined above for walkway/dune restoration as part of the current submitted application, SVCA staff confirm the following:

1. SVCA staff cannot deem the current application complete as a satisfactory dynamic beach hazard assessment was not completed. As such, the dynamic beach hazard limit mapped by SVCA will not change.

2. Should the permit application be deemed incomplete, the Town is offered the opportunity to make a formal request to the General Manager/Secretary-Treasurer to render a decision with respect to completeness. If the General Manager/Secretary-Treasurer determines the permit application to be incomplete, the Town can then make a formal request for an Administrative Review before the Executive Committee.

3. Should the Executive Committee deem your application complete without staff's recommendation for a satisfactory dynamic beach hazard assessment, decision for development within the dynamic beach hazard will also be deferred to SVCA's Executive Committee. As previously advised, the proposed portion of development within SVCA's dynamic beach hazard limit is not supported by SVCA's policies.

4. The proposed development remains within the Flooding Hazard Limit of Lake Huron, albeit with recommended floodproofing elevations. However, SVCA's policies do not support development, in general, within the lakeshore Flood Hazard Limit. Therefore, the application could not be approved at a staff level and would need to be deferred to SVCA's Executive Committee for decision.

We trust the above information addresses the comments and points of clarification outlined in your June 4, 2021 correspondence. It was also our intent to outline the process for moving the CCV application forward given that the Town has chosen not to authorize any additional work to confirm the dynamic beach hazard and this assessment is integral to shoreline development applications.

SVCA staff look forward to meeting with you and your team to discuss the contents of this letter on July 23, 2021.

Best regards,

Jennifer Stephens
General Manager/Secretary-Treasurer
Saugeen Valley Conservation Authority

JS/BW

cc: Grant Diemert, Applicant's Agent (via email)
Cheryl Grace, Director, SVCA (via email)
Mike Myatt, Director, SVCA (via email)
Brandi Walter, Coordinator, Environment Planning, SVCA (via email)
Erik Downing, Manager, Environmental Planning and Regulations, SVCA (via email)
Peter Zuzek, Zuzek Inc. (via email)

Shoreplan Engineering Limited
20 Holly Street, Suite 202
Toronto, ON Canada M4S 3B1
T) 416.487.4756 F) 416.487.5129
E) mail@shoreplan.com

July 23, 2021

Ms. Amanda Froese, P. Eng.
Director, Infrastructures and Development Services
Town of Saugeen Shores
600 Tomlinson Drive
Port Elgin, ON, N0H 2C0

Re: Cedar Crescent Village Follow-up
Our File: 20-3366

Dear Ms. Froese:

This letter has been prepared in response to Items 1 a) and b) from the May 12, 2021 letter from Saugeen Conservation to Kara van Myall. That letter described what SVCA considered to be outstanding critical information and included methodologies to address their requirements. We have included SVCA's May 12th comments below to provide context for our replies.

SVCA Comments

SVCA 1. a) The 100-year flood elevation, which is based on 1988 data, should be assessed to confirm whether the MNR 1989 levels remain representative of the current risk associated within the 100-year instantaneous water level on Lake Huron. SEL's methodology for the extreme value analysis is not consistent with the approach used by MNR (1989) to establish the instantaneous lake level of 177.6 m GSC (100-year lake level). As such, SVCA recommends that an assessment of the 100-year flood level based on a joint probability analysis of storm surge and static lake level should be completed for the entire period of available data at the Goderich and Tobermory gauges to re-assess the historical MNR (1989) results.

Recommended methodology to address this requirement:

The joint probability analysis should consist of the following steps:

- An extreme value (EVA) analysis of the historical monthly mean lake level data (lakewide average, available from the Department of Fisheries and Oceans), including 2020.
- EVA of measured storm surges from the Goderich and Tobermory water level gauges using all available hourly data (with storm surges extracted from the hourly water level record).
- A joint probability analysis on the monthly mean and storm surge EVAs for the Goderich and Tobermory gauges.

- Compare the results to the published MNR (1989) data at Goderich and Tobermory. If differences are noted, the published gradients in the 100-year instantaneous water levels from MNR (1989) can be used to establish a revised level for Port Elgin/Southampton.

Extreme Value Analyses

Our analysis followed SVCA's recommended methodology. We started by obtaining historical monthly mean lake level data from DFO for the period from 1900 to 2020. We also obtained the "Basis of Comparison" (BOC) mean water level data used in the MNR analysis to ascertain its significance to the MNR analysis. The BOC data adjusted historic water level observations in order to represent a constant set of conditions of regulations and diversions.

The MNR extreme value analyses were completed using the HYDSTAT frequency analysis model, but that model is no longer available from MNRF. We completed all of our analyses using the EVA model developed by DHI. EVA can consider up to nine different probability distributions with different estimation methods, depending upon the distribution. Results include goodness of fit statistics, user selected return-period estimates, and confidence interval parameters. MNR(1989) did not consider confidence intervals so we followed that approach.

For our analyses we considered the Generalized Extreme Value (GEV), Gumbel, Weibull, Log Pearson Type 3, and Generalized Pareto probability distributions. The distribution with the highest correlation between the ordered observations and the corresponding order statistics was selected as the preferred distribution. If one or more distributions had the same correlation coefficient, results were taken from the distribution with the lowest standardized least squares criterion.

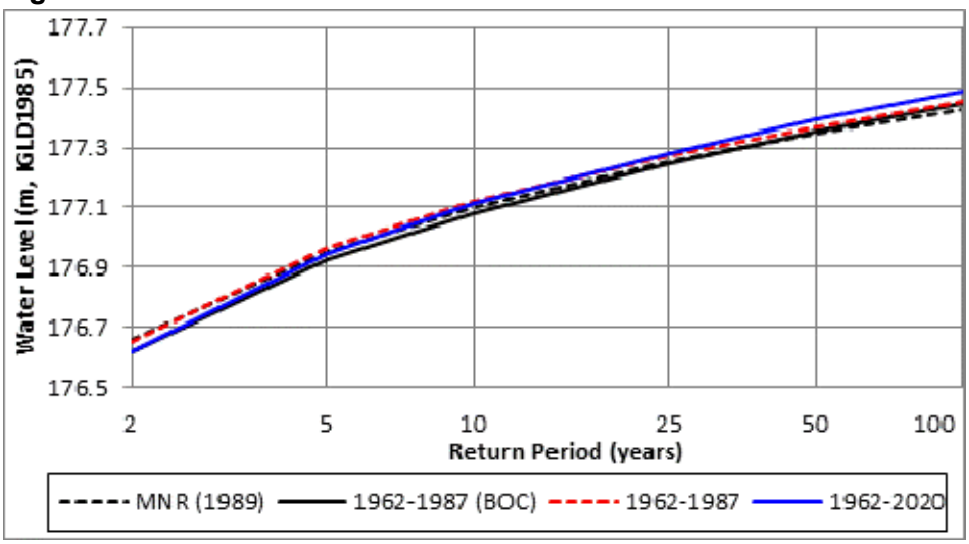
Mean Water Levels

Extreme value analyses were performed on annual maxima data series for observed Lake Huron mean water levels from 1900 to 1987 and from 1900 to 2020. An analysis was completed using the BOC mean water levels from 1900 to 1987. The 1900 to 1987 analyses were completed to provide a comparison to the MNR (1989) results.

Figure 1 shows the return period estimates for the three mean water level data sets compared to the MNR results. The reported MNR values, which were in metres above 1955 International Great Lakes Datum (IGLD1955) were converted to IGLD1985 using the conversion for Goderich. It can be seen from Figure 1 that the Basis of Comparison adjustments had only a minor impact on the analyses and that the 100-year return period mean water level for 2020 is marginally higher than the MNR value. The BOC adjustments did not need to be considered for the 1900 to 2020 data set.

The 100-year return period mean water level estimates were 177.43m from MNR, 177.44m for the 1900-1987 BOC data, 177.45m for the 1900-1987 CHS data, and 177.49m for 1900-2020 CHS data.

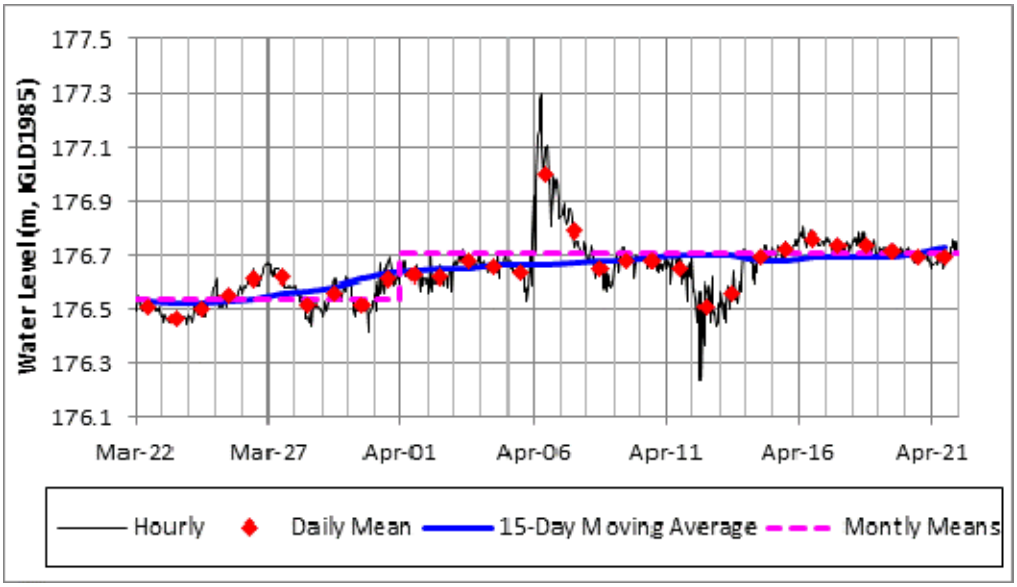
Figure 1 Lake Huron Mean Water Level Return Period Estimates



Surges

Storm surge data sets were produced for both Goderich and Tobermory by subtracting calculated mean water levels from recorded hourly water levels at each site. Mean water levels were estimated by performing a 15-day moving average smoothing of recorded daily water levels. Figure 2 shows the water levels during the April 6, 1979 surge at Goderich. That was the highest surge calculated for Goderich, and had a height of 0.64m. It is presumably 0.05m higher than would have been calculated by MNR for the same event because MNR calculated surges as the height above the mean monthly water level.

Figure 2 Water Levels During the April 1979 Surge at Goderich



SHOREPLAN

Storm surges were calculated for the period from 1962 to 2020, which was the coverage available for the hourly water level data. Peak-over-threshold extreme value analyses were performed for 1962 to 1987 to compare to the MNR surges and from 1962 to 2020 as part of the updating exercise. Figure 3 and Figure 4 show the return period estimates for Goderich and Tobermory, respectively.

Figure 3 Storm Surge Return Period Estimates at Goderich

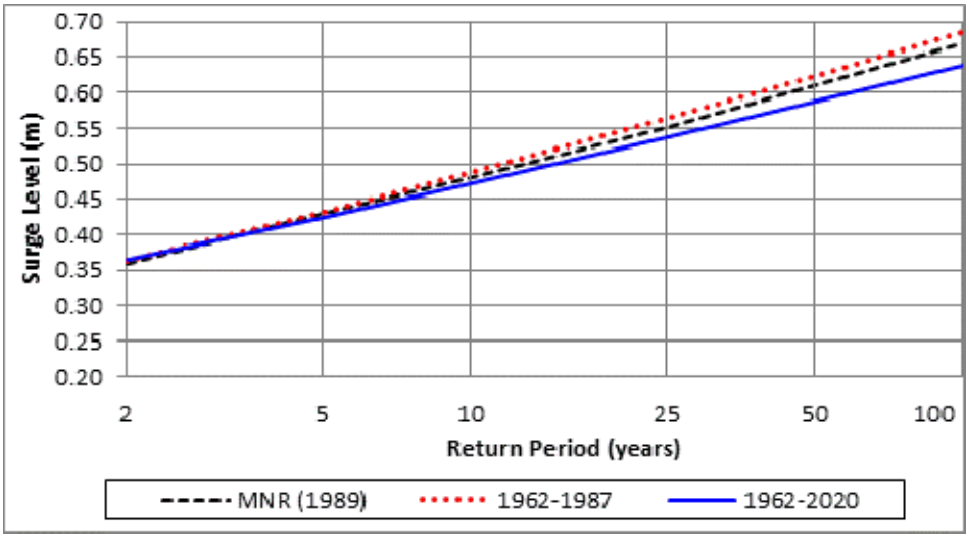
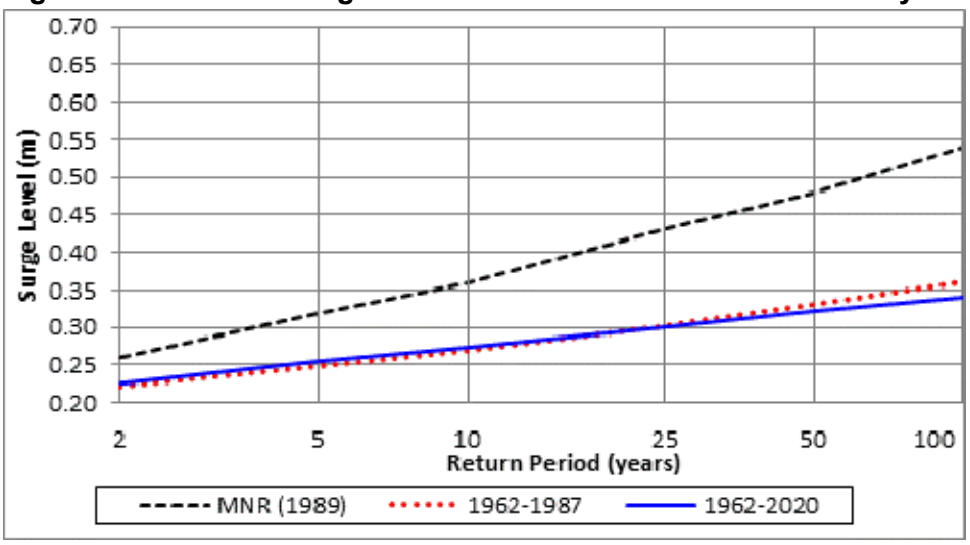


Figure 4 Storm Surge Return Period Estimates at Tobermory



The 1962-1987 100-year return period surge calculated at Goderich was only 1cm higher than the MNR estimate and may be viewed as essentially the same value. The small increase may have been due to the differences in how surge heights were calculated. The 1962-2020 100-year return period surge was 4cm lower than the MNR value, which again is a small difference and was likely due to the larger data set associated with the longer period considered.

The 1962-1987 and 1962-2020 surges calculated at Tobermory show a consistent pattern to those at Goderich, but are notably lower than the MNR estimates. It is not possible to say why without seeing the actual surge levels calculated by MNR. The highest surge we calculated at Tobermory was 0.32m and occurred in 1983.

Combined Probabilities

Updated combined probability analyses were completed for the mean water levels and the surges at Goderich and Tobermory. The distribution parameters from the EVA analyses were used to calculate probability mass functions for each distribution, which were then combined using the method for the convolution of two independent discrete random variables. Return period values were calculated from the exceedance probability of the combined distributions. These represent the instantaneous water level estimates, with the 100-year return period value being the flood level defined by MNR. Figure 5 and Figure 6 show the updated combined water levels requested by SVCA compared to the MNR values at Goderich and Tobermory. The MNR values were converted from IGLD1955 to IGLD1985 using the conversions provided by CHS for each gauge. The 2020 updated values were calculated to be 177.89m IGLD1985 at Goderich and 177.74m

IGLD 1985 at Tobermory. These are 0.09m higher than the MNR(1989) value at Goderich and 0.06m lower than the MNR(1989) value at Tobermory.

Figure 5 Combined Water Level Return Periods at Goderich

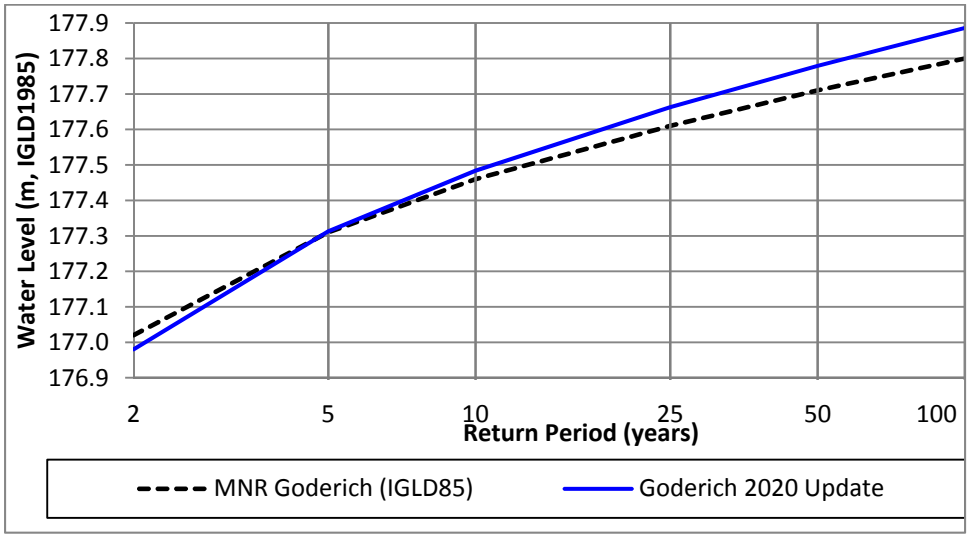
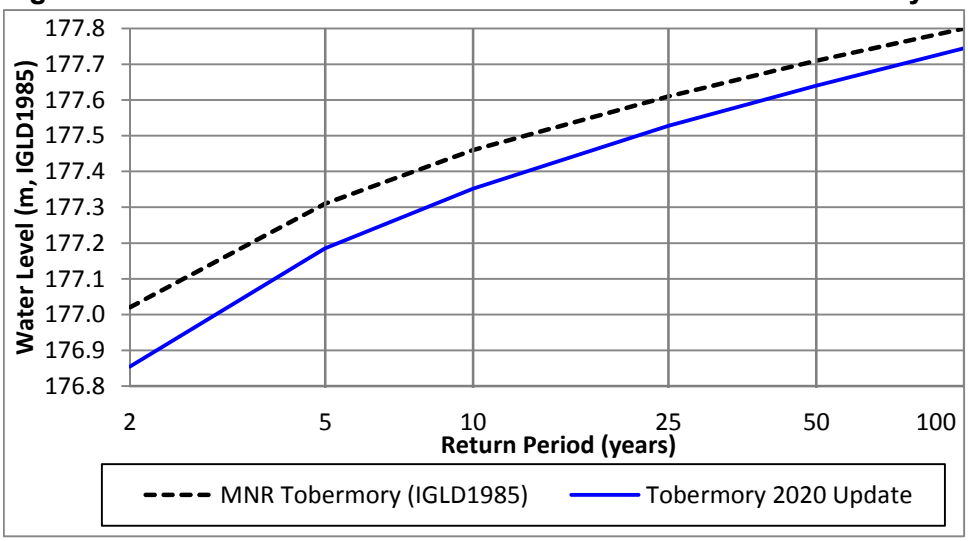


Figure 6 Combined Water Level Return Periods at Tobermory



The combined probability analyses described above used the results of the extreme value analyses based on full-year data. That could possibly produce conservative estimates because the highest surges may not occur at the same time as the highest mean water levels. Mean water levels typically peak in the summer whereas severe storms, which cause the surges, mostly occur in the early spring and late fall. It is our opinion that completing a

seasonal combined probability analysis is no more warranted than the full-year analysis was. Figure 7 and Figure 8 show comparisons of the return period estimates at Goderich and Tobermory based on the combined probability analysis described above and an extreme value analysis of hourly water level records. The 1cm difference in 100-year return period values at Goderich and the 2cm difference at Tobermory are not statistically significant.

Figure 7 Instantaneous Water Level Return Periods at Goderich

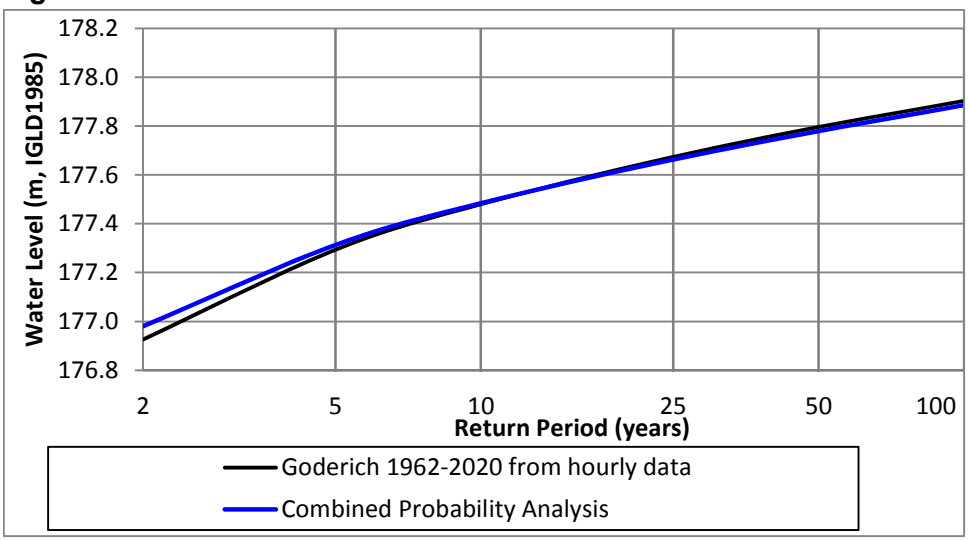
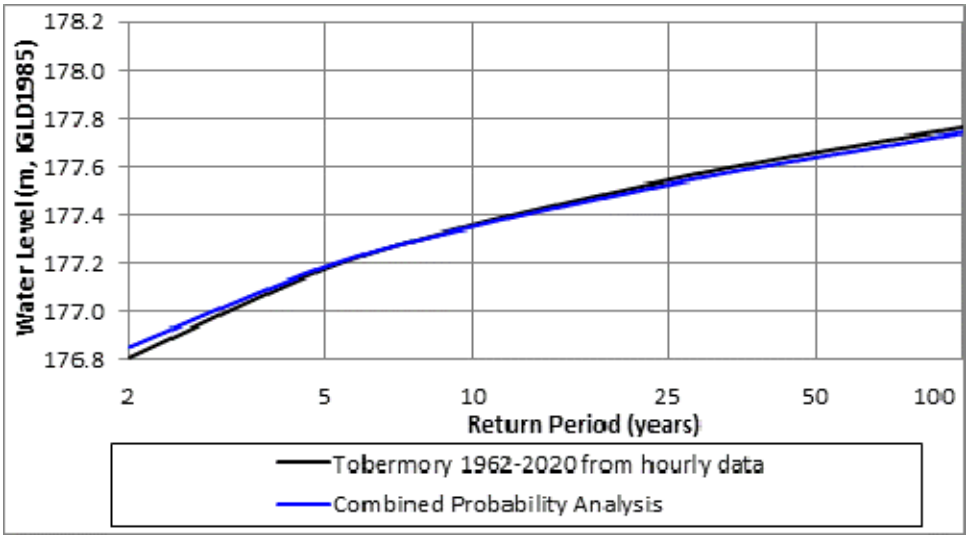


Figure 8 Instantaneous Water Level Return Periods at Tobermory



Floodproofing Elevation

The floodproofing elevation used in our hazard assessment is the sum of the 100-year mean lake level and the 100-year surge height, as specified by the MNR Technical Guides. Using the updated numbers described above, the floodproofing elevation at Goderich is 178.12m IGLD1985, which is 0.02m higher than the MNR(1989) values. The updated floodproofing elevation at Tobermory is 177.83m IGLD1985, which is 0.14m lower than the MNR(1989) value.

Summary and Recommendation

Table 1 summarizes the water levels described above.

Table 1 Water Levels Summary

	100-Year Return Period Values		
	MNR (1987)	Update (2020)	Difference (2020-1987)
Lake Huron Mean Water Level (m, IGLD 1985)	177.43	177.49	0.06
Goderich Surges (m)	0.67	0.64	-0.03
Goderich Flood Level (m, IGLD 1985) - combined	177.80	177.89	0.09
Goderich Floodproofing Level (m, IGLD 1985)	178.10	178.12	0.02
Tobermory Surges (m)	0.54	0.34	-0.20
Tobermory Flood Level (m, IGLD 1985) - combined	177.80	177.74	-0.06
Tobermory Floodproofing Level (m, IGLD 1985)	177.97	177.83	-0.14
Goderich (1962-2020) Annual Maxima from Hourly	177.90		
(difference to combined probability)(hourly-combined)	0.01		
Tobermory (1962-2020) Annual Maxima from Hourly	177.76		
(difference to combined probability)(hourly-combined)	0.02		

We do not recommend lowering the design water levels on the basis of the Tobermory differences. It is our opinion that the increases calculated at Goderich do not warrant recalculation of the flood hazard limits, particularly considering the trivial difference in floodproofing elevations which are what ultimately dictate design at this site. We recommend that the 100-year flood level and floodproofing level calculated by MNR(1989) continue to be used.

SVCA 1. b) SVCA recommends that clarification be provided as to why the maximum potential uprush elevation from the six analyzed transects are not considered for the delineation of the flood hazard limit, versus the lowest uprush elevations. The uncertainties on where the runup profiles were extracted from and if they represent the most flood prone portion of the beach is a critical input into the wave uprush calculation, as is the 100-year flood level.

SHOREPLAN

Recommended methodology to address this requirement:

- If the 100-year flood level increases at Port Elgin/Southampton, then the runup analysis will have to be repeated.
- In Figure 1 of the original SEL report (Oct. 28, 2020) the runup profiles were mapped. There is no analysis of wave runup potential for the lowest section of the walkway (identified as the beach maintenance access point by Ms. Van Myall on the April 29, 2021 conference call between SVCA and TSS staff).
- This vulnerable section of the walkway needs to be evaluated for wave uprush to map the flood risk for the existing site conditions. The results should be presented in 2D for the beach and the parking lot at Port Elgin with either AutoCAD or GIS for the maximum potential uprush limit, not the lowest uprush elevation.

Wave Uprush Limit and Flood Hazard Limit

The flood hazard limit is a line drawn on a plan of site. It represents multiple elevations, not just the highest uprush elevation that occurs somewhere on the site. The highest uprush elevation occurs on the constructed dune near the harbour and is well lakeward of the delineated flood hazard limit. Using the highest elevation instead of the furthest inland incursion, which occurs in the parking lot at a lower elevation, would reduce the flood hazard limit.

Figure 1 of our October 28, 2020 hazard assessment report showed the location of five of the seven uprush profiles considered in our original assessment. Two profiles were not shown because they were outside the site limits considered in that report.

For this update we added three profile lines to the south of the area initially analysed, giving a total of ten profiles. Wave uprush limits were calculated using the same procedure described in our October 28, 2020 report.

Figure 9 shows the locations of the ten profile lines and the calculated flood hazard limit. The flood hazard limit is based on the calculated extent of wave incursion onto the subject property. It is not based on any specific elevation.

Adding the new profile lines did not change the flood hazard limit for the Cedar Crescent Village site. The additional analysis has had no substantive impact on our previous work and the results and conclusions from our October 28, 2020 hazard assessment have not changed. A portion of the

proposed development site is within the flood hazard limit but the flood hazard can be suitably addressed with appropriate floodproofing measures. Those floodproofing measures will have no impact on flooding or erosion on adjacent properties.

SHOREPLAN

Closing Comments

We trust that this letter addresses SVCA's comments to your satisfaction. Please feel free to contact us if you have any comments or questions.

Yours truly,

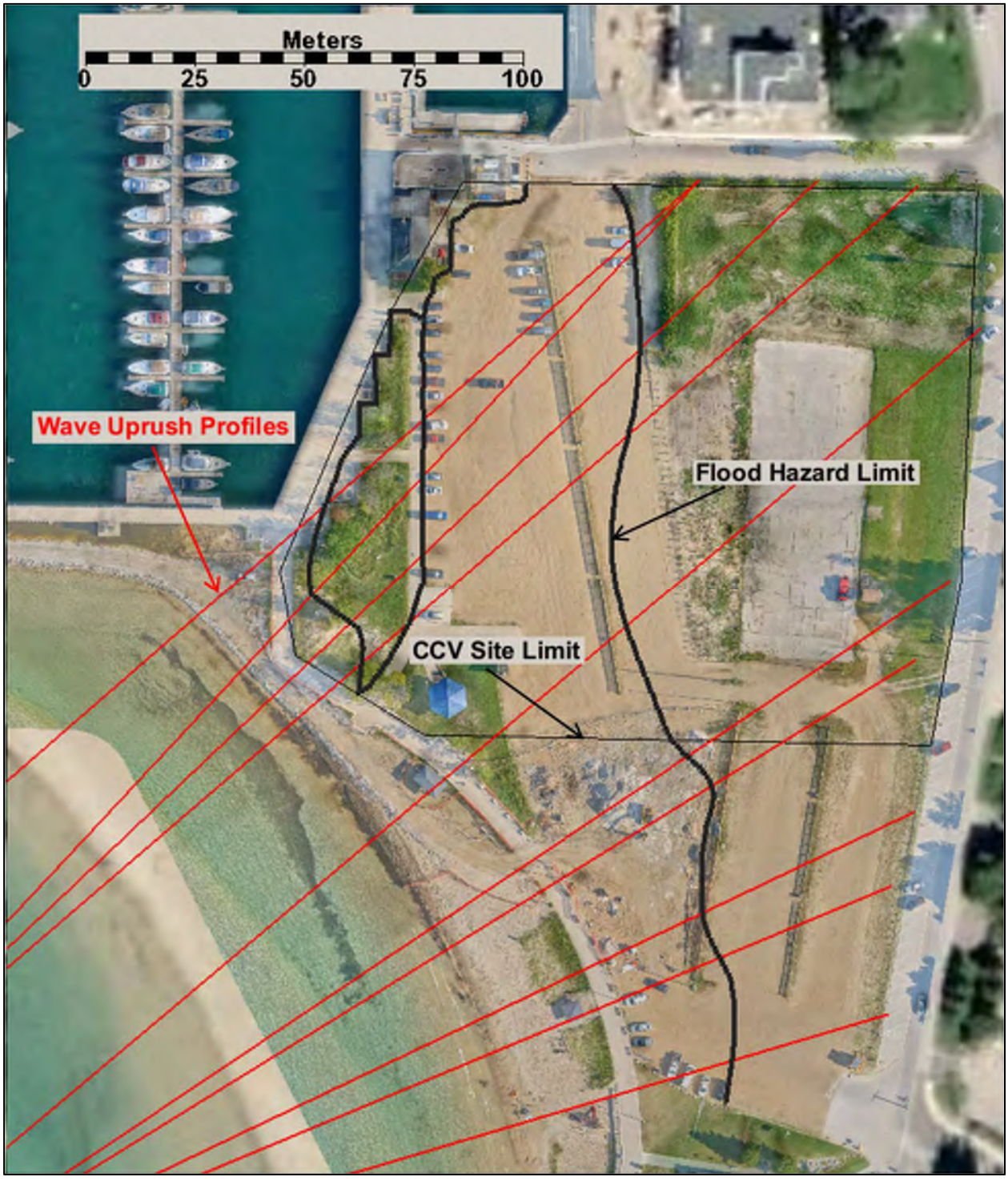
Shoreplan Engineering Limited

Bruce Pinchin, P. Eng.

M. Sturm, P.Eng.

ec: Paola Donnini: padonnini@gmail.com

Figure 9 Updated Flood Hazard Limit



Town of Saugeen Shores
600 Tomlinson Drive, P.O. Box 820
Port Elgin, ON N0H 2C0

August 17, 2021

Maureen Couture, Chair
Jennifer Stephens, General Manager/Secretary-Treasurer
Saugeen Valley Conservation Authority
SENT BY EMAIL

Re: Cedar Crescent Village Permit Application (122 Elgin Street, Port Elgin) Third Submission

Dear Ms. Couture and Ms. Stephens,

The Town's project team offers this response to the most recent correspondence to the Town of Saugeen Shores dated July 22nd, 2021 and titled SVCA Application for Development: Cedar Crescent Village – Third Submission.

In order to continue the advancement of the above noted project, we would like to request an Administrative Review. It is our contention that the application submitted was complete, as it contained the required information. At the same time, we request a Section 28 Hearing be coordinated in conjunction with the Administrative Review to review the technical merits of the existing conditions for the application. We respectfully request that this meeting be scheduled immediately.

The information provided by our experts deviates from the professional opinion of the SVCA's expert and has caused the project to stall. Determining the existing conditions and hazard limits is independent of the final site plan (as acknowledge by SVCA staff, this can be a condition of approval), and our team wishes to have this resolved before final details are completed to ensure what is shown on the permit is reflective of what will be built.

Once a decision is reached on the limits of the Dynamic Beach and the Flood Hazard, staff and the proponent will update the Site Plan, compete with grading and servicing information along with a justification as to how the development satisfies the conditions of the permit. This includes protection of the development and upstream properties from flooding.

As has been noted, the goal of the team was to reach consensus and move ahead with permit approvals and detailed engineering work to meet a September construction date. We believe at this point, a review by the Executive Committee to decide the Flood Hazard Assessment and Dynamic Beach Hazard is warranted.

1. Flood Hazard Assessment

The Flood Hazard Assessment was updated and completed as additionally requested and the results did not substantially change the original submission of the flood limit. The recommendations from the revised assessment are to keep the same Flood Hazard Limit and flood proofing elevations as originally outlined. We therefore maintain that this issue is addressed and the permit should be able to advance based on this information.

2. Dynamic Beach Hazard

The Town's expert does not agree with the suggested additional analysis methodology requested to assess the Dynamic Beach Hazard and we believe the original assessment was sufficient to determine the Dynamic Beach Hazard. We stand behind the original submission for this assessment where Shoreplan Engineering Limited determined the existing dynamic beach line is along the hardened edge of the existing Promenade (walkway), with no natural dynamic processes occurring east of the promenade. Therefore, we believe this issue is addressed and the permit should be able to advance based on this information.

The conclusion of the discussions that have been going on since March, is that the technical analysis for #1 and #2 above were completed however, the technical merits are unable to be resolved at the staff level with the lack of consensus between the technical experts. With the delays that have occurred to the desired construction timing, we wish to continue advancing the detailed site plan and engineering work once a decision has been rendered on the two items above.

A construction start in the fall of 2021 is desired and therefore we respectfully request that the two administrative processes be consolidated into one hearing for two reasons: (1) the Town believes that the application is complete; and (2) the professionals engaged in the process are unable to reach consensus on a path forward requiring the Section 28 Hearing.

Sincerely,

Kara Van Myall, CAO
Town of Saugeen Shores

cc. Council, Town of Saugeen Shores
Cheryl Grace, Director, SVCA
Mike Myatt, Director, SVCA
Grant Diemert, Applicant's Agent
Brandi Walter, Coordinator, Environment Planning, SVCA
Erik Downing, Manager, Environmental Planning and Regulations, SVCA
Amanda Froese, Director, Infrastructure and Development, Saugeen Shores
Phil Eagleson, Director, Protective Services, Saugeen Shores

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, publicinfo@svca.on.ca, www.svca.on.ca

SENT BY E-MAIL ONLY (kara.vanmyall@saugeenshores.ca)

August 27, 2021

The Corporation of the Town of Saugeen Shores
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON
N0H 2C0

Dear Ms. Van Myall:

RE: Request for Administrative Review and Section 28 Hearing
Cedar Crescent Village Permit Application (122 Elgin Street, Port Elgin)
122 Elgin Street
Roll No. 411046000335300
Plan 259, Harbour Block 2
Geographic Town of Port Elgin
Town of Saugeen Shores

Saugeen Valley Conservation Authority (SVCA) staff acknowledges receipt of your letter, dated August 17, 2021, requesting an Administrative Review and Section 28 Hearing under the *Conservation Authorities Act* regarding the proposed Cedar Crescent Village (CCV) development.

In your correspondence of August 17, 2021, the Town requested that an Administrative Review and Section 28 Hearing be conducted simultaneously. It is not possible for these two processes to take place at the same time as they serve separate and distinct purposes. Further, one of these processes has a legal standing, while the other does not.

- An Administrative Review is the avenue used when staff feel the permit application submitted by an applicant is incomplete and the applicant is of the opinion that the application is complete.

- A Section 28 Hearing is the avenue used when staff are in a position where they have all the components necessary to render a decision, however, they cannot approve the

permit application based on the development affecting the control of flooding, erosion, dynamic beaches and/or pollution.

As indicated in our last correspondence to the Town of Saugeen Shores, dated July 22, 2021, SVCA cannot deem the CCV permit application complete as a satisfactory dynamic beach hazard assessment was not completed. **Therefore, to move this file forward, it would be appropriate to move to an Administrative Review of the materials submitted.**

The option of having an Administrative Review where the completeness of a permit application is in question is outlined in correspondence sent to the Town on June 19, 2019, March 3, 2021, May 21, 2021, and July 22, 2021. The first step of the Administrative Review process is a review by the General Manager/Secretary-Treasurer to ascertain whether there is support for staff's rationale for the application being incomplete.

I have reviewed the materials submitted by the Town of Saugeen Shores, as well as all correspondence sent by Saugeen Valley Conservation Authority to the Town to effectively make my decision. SVCA staff have communicated that they require a permit application, the permit fee, and several technical documents to complete a fulsome review of the CCV development proposal. These technical documents include a flood hazard assessment, a dynamic beach assessment, adjacent flood and erosion impacts and floodproofing details, and site plan/draft master plan and engineering drawings. For the CCV Permit Application, SVCA staff recommend that these technical documents are necessary to formulate a complete application. On Thursday, April 29th, the Town of Saugeen Shores communicated that submitting these materials simultaneously would be problematic as the results and approval of the flood hazard assessment, for example, would impact the preparation of the site plan and engineering drawings. SVCA and the Town mutually agreed that the elements of the complete application would be submitted in two components: the flood hazard and dynamic beach assessments, followed by the remainder of the materials once the assessments had been approved by SVCA.

In general, SVCA staff are satisfied with the statistical analysis of the flood hazard assessment undertaken by the Applicant's consultant, and as such, I consider this requirement met. Therefore, the completion of the Flood Hazard Assessment is not in question. However, a Dynamic Beach Hazard Assessment has not been completed. SVCA's mapping shows that a portion of the proposed development is located within the dynamic beach hazard limit. Although some information has been submitted by the Applicant, it is my opinion that this does not constitute a study, or a plan to address this hazard, because the report submitted to SVCA did not provide scientific or engineering justification to substantiate eliminating or reducing the dynamic beach allowance, or an assurance that such is feasible.

Therefore, I recommend that an Administrative Review of the completeness of the CCV Permit Application be conducted by SVCA's Executive Committee on **Tuesday, September 7th, 2021, between 2:00 pm and 4:00 pm.** The focus of this Administrative Review is the absence of the Dynamic Beach Hazard Assessment and whether the information submitted by the Town to

date is satisfactory to deem the application complete. Since it was agreed by both the Town and SVCA that the adjacent flood and erosion impacts, floodproofing details, site plan/draft master plan and engineering drawings would be submitted following approval of the flood hazard and dynamic beach hazard assessments as the second components of the complete permit application, it is SVCA's understanding that these materials will be forthcoming for approval once the Administrative Review confirms the need for the Dynamic Beach Hazard Assessment or not.

As the agenda materials are required to be submitted one week in advance of an Executive Committee Meeting, I ask that you provide any presentation materials to me by 2:00 pm on Tuesday, August 31st.

If you have any questions about this correspondence or the scheduled Executive Committee meeting, please do not hesitate to contact me.

Best regards,

Jennifer Stephens

Jennifer Stephens
General Manager/ Secretary-Treasurer
Saugeen Valley Conservation Authority

Cc: Grant Diemert, Applicant's Agent (via email)
Peter Zuzek, Zuzek Inc. (via email)
Cheryl Grace, Director, SVCA (via email)
Mike Myatt, Director, SVCA (via email)
Maureen Couture, Chair, SVCA (via email)
Brandi Walter, Coordinator, Environment Planning, SVCA (via email)
Erik Downing, Manager, Environmental Planning and Regulations, SVCA (via email)

BRUCE M. PINCHIN, P. Eng.
Senior Engineer

EDUCATION

B.Sc. Civil Engineering, Queen's University at Kingston, 1983

PROFESSIONAL EXPERIENCE

Mr. Pinchin has developed and/or applied numerical models dealing with wave hindcasting, wave transformation, nearshore circulation, alongshore and cross-shore sediment transport and beach plan shape. He has completed a number of Shoreline Management Plans as well as hundreds of shoreline hazards assessments in accordance with provincial guidelines. He has designed and administered the construction of a number of coastal structures ranging from artificial beaches to breakwaters, revetments and seawalls. He has examined the potential impacts of both conceptual and actual coastal projects, including the mining of offshore resources and the impacts of harbours, breakwaters and harbour dredging. He has worked on projects for the Great Lakes, the Beaufort Sea, the Canadian East Coast and the Caribbean.

MAJOR PROJECTS

Scarborough Waterfront Environmental Assessment –Baseline analysis of coastal conditions for a major waterfront park and trail system. Development and assessment of a number of alternative shoreline treatments for each shoreline reach. Impact assessment for preferred alternative.

Beausoleil First Nation Wharf Reconstruction – Wave hindcasting, nearshore transformations and sediment transport modeling for the design of two ferry terminal upgrades. Assessment of alternatives and potential impacts on coastal processes.

Wolfe Island Ferry and Dock Improvements – Comprehensive numerical analysis of design wind, wave, and water level conditions for an Environmental Assessment and detailed design of new ferry terminals. Assessed impact on nearshore circulation patterns due to water quality concerns.

Georgian Bay Shoreline Hazard Mapping – Detailed flood and dynamic beach hazard mapping for entire Collingwood and Wasaga Beach shoreline of Georgian Bay. Detailed site review to document existing conditions along the shoreline, including the presence of all shoreline protection structures.

Saskatchewan Harbours Rehabilitation Assessments – Site review and assessment of Small Craft Harbours at Jan Lake and Isle-a-la-Crosse Saskatchewan. Evaluation of existing condition of harbour structures and cost estimates for removal or restoration of all structures to functional equivalence of original condition.

Amaranth Harbour Rehabilitation Assessment – Site review and assessment of Small Craft Harbours at Amaranth Manitoba. Evaluation of existing condition of harbour structures and entrance channel. Cost estimates to either restore site to pre-construction condition or rehabilitate structures and access channel to functional equivalence of original condition.

Lake Superior Lighthouse Decommissioning – Analysis of wind, wave and water level conditions and their impact on construction access to lighthouses on Michipicoten and Shaganash Islands. Cost estimates for marine work associate with lighthouse decommissioning.

Toronto Island Airport Seawall Inspections – Assessment of existing condition and concept design of repairs to seawall at Toronto Island Billy Bishop Airport. Supervised multi-day underwater inspection and developed alternative rehabilitation designs ranging from piecemeal repair of the more severe problem areas to construction of new seawalls.

Natural Hazard Assessments – Erosion, flooding, and dynamic beach hazard limit delineation, as applicable at each site, for more than 100 private properties on Lake Ontario, Lake Erie, Lake Huron, Georgian Bay, and Lake Simcoe. Site reviews and assessments in accordance with Ontario Ministry of Natural Resources guidelines.

Kahnawà:ke Shoreline Vulnerability Assessment – Flood and erosion vulnerability assessment of a portion of the St. Lawrence River shoreline of the Kahnawà:ke First Nations lands. Analysis of impact of water levels, wind waves, and Seaway traffic on shoreline conditions. Inventory and assessment of all shoreline protection structures. Production of

new hazard mapping and recommendations for shoreline management practices.

Leslie Street Spit Stability Assessment – Detailed assessment of current condition and expected future development of headland beach systems protecting the east shore Endikement and the south shore of the East Headland. Underwater reviews by divers and high resolution sonar. High resolution aerial survey of above water structures.

Goderich Harbour Breakwater Rehabilitation – Assessment of wave agitation levels associated with overtopping of subsiding caisson breakwaters. Development of wave height exceedance curves for both existing conditions and possible rehabilitation alternatives.

Quinte Isle Hazard Analysis – Wave uprush and overtopping analyses for two low-elevation, flat backshore sites at risk of flooding during high lake levels. Produced new flood hazard limit maps and developed floodproofing plans for at-risk areas.

Dynamic Beach Outlet Assessments – Assessment of potential impact of new storm water outlet structures for three separate dynamic beach sites on Lake Huron. Wave transformations, wave uprush, and cross-shore sediment transport modelling to determine both potential impact of the structures on the dynamic beaches, and the vulnerability of the outlets to design wave conditions. Proposed structural modifications to two of the outlets due to wave exposure.

Lakeview Waterfront Connection – Environmental Assessment and detailed design of a major waterfront park in Mississauga. Comprehensive numerical analyses of wave and sediment transport conditions for both existing conditions and with a major lakefill. Physical modeling of the preferred design at the National Research Council Canada laboratory.

Ashbridges Bay Coastal Engineering Study and Impact Assessments – Comprehensive numerical modeling of sedimentation patterns within Ashbridges Bay. Impact assessment for alternative concepts for modifying marina entrances while mitigating a sedimentation problem. Assessment of potential impacts of a major lakefill required to facilitate the expansion of an adjacent water treatment plant.

Quinte West Municipal Marina Individual Environmental Assessment Completed IEA for new municipal marina on the Bay of Quinte. Work. Completed coastal site condition assessment including river flow numerical modeling.

Gore Bay Breakwater – Feasibility assessment of floating verses fixed breakwater solutions for existing wave agitation problem in Gore Bay Harbour. Municipal Class Environmental Assessment to select a preferred fixed breakwater alternative. Concept design and coastal engineering study, followed by detailed design and approvals process. Construction administration during the implementation phase.

Ontario Place Wave Analysis – Assessment of design conditions along the shoreline of Ontario Place. Wave uprush and overtopping calculations to determine susceptibility of existing structures.

Casablanca Village Beach – Sediment transport modeling and interpretation of results as part of detailed design of an artificial sand and gravel beach for new development located on an eroding cohesive shore.

Wasaga Beach Areas 1 and 2 – Comprehensive natural hazards assessment for redevelopment master plan for Wasaga Beach. Completed wave uprush assessment.

Port McNicoll Shoreline Development – Wide range of coastal engineering services for the redevelopment of a large port area. Assessment of existing conditions and natural hazards for more than 3 kilometers of shoreline covering 4 different development phases. Development and assessment of shoreline treatment concepts, detailed design, permitting, and negotiation with approving agencies.

Lakefront Promenade Park, Mississauga, Harbour Entrance wave Agitation Study Completed numerical modelling to assess mitigation of wave agitations near the entrance of the harbour.

Port Burwell Sedimentation and Dredging Review – Analyses of fluvial and lacustrine sources contributing to a major sedimentation problem at the entrance to Port Burwell Harbour. Assessment of alternative dredging solutions.

Kingston Yacht Club – Analysis of existing wave conditions and feasibility assessment for implementation of a floating breakwater.

Black River Sedimentation Review – Analysis of causes of sedimentation within the navigable entrance to the Black River on Lake Simcoe. Impact assessment for proposed removal of existing pier.

Oakville Shoreline Structure Review – Assessment of 84 existing protection structures along Oakville's municipally owned Lake Ontario

shoreline. Assessment and ranking of each structure to determine maintenance and repair priorities. Development of a relational database to track assessment data.

Burlington Beach Flood Hazard Analysis – Wave hindcast, transformation, uprush and flooding analysis for large dynamic beach at the western end of Lake Ontario.

Lake Ontario Integrated Shoreline Study (LOISS) Coastal engineering component of a large multi-disciplinary shoreline study to remediate and naturalize the Lake Ontario shoreline within the City of Mississauga.

Ancient Coastal Seashore Development – Natural hazards assessment for proposed new development on Lake Simcoe, including flood and erosion assessments, determination of ice-jamming risk, and negotiation with approving agency.

Goderich Harbour Sediment Transport – Detailed evaluation of sediment transport rates behind Goderich Harbour breakwaters to assess ongoing dredging program. Assessment of potential impacts of proposed harbour modifications

Gibraltar Point, Toronto Islands -Class Environmental Assessment for erosion of control of complex beach shoreline on an eroding spit. Development of innovative protection scheme involving sand back-passing program with segmented offshore breakwaters.

Wheatley Harbour Detailed Sediment Transport Analysis – Comprehensive analysis of sediment transport rates past a harbour entrance. Impact Assessment of proposed harbour entrance structure modifications

Port Glasgow Harbour Entrance – Detailed design of new entrance to Port Glasgow Marina and Yacht Club. Sediment transport impact assessment of proposed entrance modifications.

Colchester Harbour Entrance – Preliminary design of new entrance to Colchester Harbour on Lake Erie. Sediment transport impact assessment of proposed entrance modifications.

Burloak Waterfront Park Class Environmental Assessment – Detailed evaluation of coastal processes and development of options for shoreline management. Prepared Environmental Study Report.

Coronation Park, Oakville – Detailed design and construction administration of shoreline protection works using cobble beaches and minimal structures. Project was used by the Waterfront Regeneration Trust as a showcase of shoreline treatments.

Lakeside Park, Oakville – Design and construction review of artificial cobble beach and headlands.

Collingwood Shipyards – Detailed assessment of structural integrity of shoreline structures built in the early 1900s.

Frenchman's Bay Entrance Restoration – Comprehensive wave and sediment transport analysis to assess impact of new entrance structures for channel passing through a barrier beach.

Resort Development, Antigua -Development of dredging plans, analysis of beach stability, design of beach rehabilitation, design and construction supervision of shoreline stability and erosion protection works.

Port Union Road Shoreline Improvements – Comprehensive wave and sediment transport analysis to assess impact of coastal structures on nearby sand beaches. Design of headland and groyne retained artificial beaches.

Newcastle Marina Impact Assessment – Determined nearshore wave and sediment transport conditions. Assessed impact of proposed development on existing nearshore sediment regime.

Ajax Marina Impact Assessment – Determined nearshore wave conditions and potential impacts associated with proposed marina and breakwaters.

Niagara Bar Stability Assessment - Analyzed stability of offshore sand bar and developed guidelines for dredging bar without effecting shoreline erosion.

Etobicoke Motel Strip – Design of cobble beach protection works for a waterfront development. Work included detailed wave climate analysis, nearshore wave transformations, beach plan and slope evaluation.

Humber Bay West Waterfront Park – Detailed nearshore wave analysis and design of artificial cobble beaches.

Mimico Linear Waterfront Park, Toronto - Detailed wave and beach stability analysis as part of design of urban waterfront park. Tannery Park Launch Ramp – Design of shoreline protection structure incorporating boat launch ramp on exposed Lake Ontario.

Boulevard Club, Wave Protection, Lake Ontario - Analysis of wave agitation problem behind existing seawall. Design of remedial works.

Lakefront Promenade Park Public Marina, Lake Ontario - Layout and design of public marina mooring area. Preparation of performance specifications tender. Evaluation and preliminary design of protective works to remedy an existing wave agitation problem in an exposed mooring area.

Snake Island Shore Protection, Toronto Islands - Detailed wave analysis and shoreline stability review

Spencer Smith Park Seawall – Wave force analysis as part of determination of cause of failure of a steel sheet pile wall cap.

Shore Treatments and Construction Methods Review, Waterfront Regeneration Trust – Review of existing practices in shoreline protection in the Toronto area. Made recommendations for use of innovative treatments for fish habitat restoration and shoreline stabilization.

Wheatley Harbour Sedimentation Study, Lake Erie - Determined source and cause of severe sedimentation problem at commercial fishery harbour. Concept design of remedial measures. Review of potential dredging alternatives.

Gichee Gummee Marina, Lake Superior - Evaluation of alternate breakwater layouts for proposed marina expansion and potential impacts on adjacent shorelines

Erie Beach Hazard Analysis, Lake Erie - Evaluated flood and erosion hazards for shoreline development

Big Bay Point Resort Development, Lake Simcoe - Determined coastal processes on a section of shoreline dominated by headland bay structures. Evaluated potential impacts of a new marina entrance and breakwaters on those processes.

Port Maitland Breakwater, Lake Erie - Detailed wave and sediment transport analysis. Assessed potential impacts on existing sand beaches associated with removal of breakwater.

Cedar Point, Georgian Bay - Evaluated potential coastal impacts of proposed recreational harbour. Review included detailed wave climate and sediment transport assessment.

St. Christopher's Beach, Goderich - Detailed assessment of wave climate and sediment transport including nearshore refraction and diffraction around harbour entrance breakwaters. Design of beach for shoreline protection.

Dawson's Marina Impact Assessment – Assessed impact of marina breakwater on existing sedimentation and water quality problems on adjacent shoreline. Evaluated potential remedial measures.

King Point Coastal Processes, Beaufort Sea - Prediction of offshore and nearshore wave conditions, alongshore currents, alongshore sediment transport rates and comparison with measured data.

Beaufort Sea Coastal Sediment Study - Implementation and interpretation of a major numerical modelling program to determine sediment transport and nearshore profile adjustment for seven arctic coastal sites. Development and implementation of new hindcasting and nearshore wave transformation techniques. Implementation and interpretation of alongshore and offshore sediment transport models.

Bluewater Beach Erosion Study -Analysis of environmental conditions for beach stability investigation. Assess stability of sand shoreline.

Lake Erie Cohesive Coast Research - Profile analysis, comprehensive sediment budget computations and historical research.

Goderich Harbour Breakwaters – Analysis and preliminary design of remedial measures to deal with excessive overtopping of breakwaters.

Elbow Harbour Marina Design, **Lake Diefenbaker** - Layout design for floating dock marina on reservoir with large water level fluctuations.

Ferndale Resort, Lake Rosseau - Analysis of design wind conditions.

Peninsula Harbour Wave Analysis, Lake Superior - Determined design wave condition for new breakwater.

Bertie Boating Club - Detailed evaluation of wave climate for a marina basin expansion on the east side of Point Abino on Lake Erie.

Kincardine Harbour Wave Analysis – Determination of design wave conditions for shoreline structures partially sheltered by Kincardine Harbour breakwaters.

Seawinds Hotel, Montego Bay, Jamaica – Analysis of wave conditions passing over a coral

reef and effects of constructing offshore breakwaters.

Trinidad Wave Analysis – Determination of wave conditions at 8 sites on the northeast shore of Trinidad as part of a development potential study.

Huyck's Bay Flow Analysis – Determination of flow rates through a barrier beach to a lagoon during storm surge events.

Welland River Siphon - Completed a hydraulic analysis of the performance of the siphon, analyzed the reduction in capacity of the siphon due to debris collected in the structure and recommended improvements.

Port Stanley Beach Runup Tables - Completed a study of flooding due to wave run up. The study resulted in the preparation of tables relating flood elevation to wind speed, direction and duration.

Coral World Sediment Study, Bahamas - Review of potential impact of dredging operations of Nassau harbour on the turbidity of water near the Coral World underwater observation facility.

Ontario Conservation Authority Shoreline Management Plans - Development of design data, design criteria and shoreline management concepts for developed and undeveloped sections of shoreline. Preparation of detailed protection and/or prevention plans for a wide variety of shorelines. Worked on preparation of plans for Kettle Creek CA, Catfish Creek CA, Long Point Region CA, Grey

Sauble CA, Grand River CA, Essex Region CA and Lower Thames Valley CA.

Lake Huron Hindcast Database - Preparation of hindcast database for 24 sites on Georgian Bay, North Channel and Canadian shoreline of Lake Huron.

Plantain Bay, Mustique, West Indies – Evaluation of effectiveness of offshore breakwaters for shoreline protection.

Sediment Transport Model - Development of detailed sediment transport computer program and transfer to Marine Directorate of Public Works Canada.

Barbados Shallow Water Hurricane Analysis – Analysis of potential wave conditions associated with a direct hurricane strike on a sheltered shallow water breakwater.

Bridgetown, Barbados, Wave Analysis - Comprehensive wave analysis to determine design wave conditions for harbour breakwater.

Technical Advisory Service, Georgian Bay - Site review, preliminary remedial design and reporting for approximately 200 properties suffering erosion and flooding problems.

Canadian Coastal Sediment Study - Implementation of alongshore, onshore-offshore sediment transport models. Development and implementation of a new parametric wave hindcasting procedure. Development of wave refraction model. Comparison of all modelling aspects with measured data.

CAREER PROFILE

1992 – Present	Shoreplan Engineering Ltd.
1990 – 1992	Sandwell Inc.
1983 – 1990	Philpott Associates Coastal Engineers Ltd.

MEMBERSHIPS

Professional Engineers of Ontario (PEO)

Certified Diver