

BRUCE BEACH MUNICIPAL DRAIN - PHASE I

Request for Authorization of Emergency Work - Section 124 of the Drainage Act

Township of Huron - Kinloss

September 22, 2021

Prepared for:

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September 22, 2021

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**Re: Bruce Beach Municipal Drain – Phase I
Township of Huron-Kinloss
Our Reference No. HK-001**

Please accept this submission as a request for Authorization of Emergency Work per Section 124 of the Drainage Act. The Township of Huron-Kinloss has identified a significant risk to public life and property. The Township has experienced damage and has developed a solution to mitigate the risk. In appreciation of the danger, and in order to protect the public and their property as soon as possible, the Township is seeking an emergency designation to authorize crucial work already initiated under the Drainage Act.

The contents of this submission have been structured to provide the Minister and the Drainage Coordinator with complete context of the situation, including the degree of severity, and the authorization of this work by way of Section 4 of the Drainage Act.

This document is the second submission for an emergency designation. Below is a summary of the steps taken since the previous submission:

June 11, 2021	First submission to OMAFRA for Emergency Designation
June 29, 2021	Decision of the Minister
July 8, 2021	Drainage Report Finalized
July 19, 2021	Consideration of the Report, and First & Second reading of the by-law
July 20, 2021	Circulation of the Provisional by-law and notice of the Court of Revision
August 9, 2021	Court of Revision (including decision)
August 12, 2021	Tendering deadline (two bids received)
August 16, 2021	Provisional Award of the Contract for the Construction of Drain (Conditional on no design appeals)
August 29, 2021	Deadline for Section 48 (engineering) appeals – No appeals received
August 30, 2021	Deadline for Section 54 (assessment) appeals – three appeals received

Yours truly,

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HEADWAY ENGINEERING
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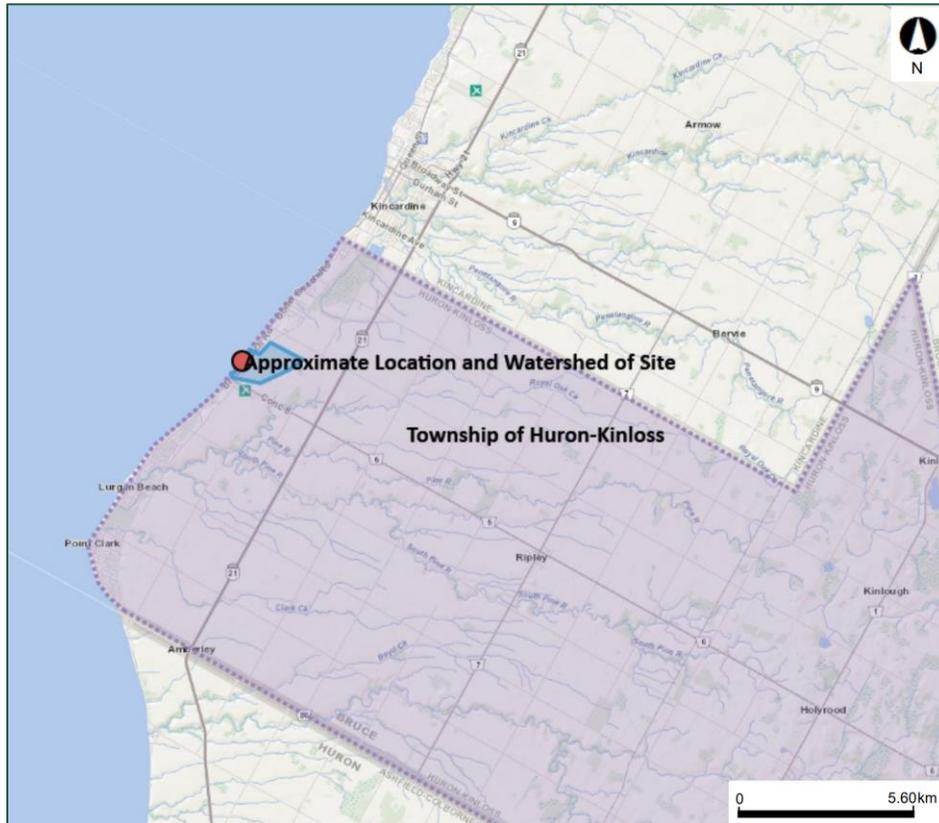
APPENDICIES

APPENDIX A –PHOTOS

APPENDIX B – DETAILS OF PUBLIC CONSULTATIONS (NOT AMENDED SINCE FIRST SUBMISSION)

1.0 LOCATION

The project is located along the shore of Lake Huron, approximately midway between Kincardine and Point Clark in the Township of Huron-Kinloss.



2.0 EXISTING DRAINAGE CONDITION

The following numbered list describes the existing condition.

1. The Drainage Area comprises of approximately 84.3 hectares (208 acres) of which approximately 80 Hectares (190 acres) is agricultural. Other land uses within the watershed include, permanent residential, seasonal residential, and roads.
2. The existing drainage system consists of an open ditch and field tiles on Lot 43, Concession Lake Range, which outlets into the top of a ravine formation just east of the Lake Range Drive road crossing. The road crossing consists of an 1800mm diameter corrugated steel pipe (CSP), which outlets into a ravine on 726 Lake Range Drive. At the downstream end of the ravine, runoff flows across Bruce Beach Road through a 900mm diameter high density polyethylene (HDPE) pipe, and then flows into an existing 1200mm diameter CSP on the 97 and 98 Bruce Beach Road properties. The outlet for the system is Lake Huron.

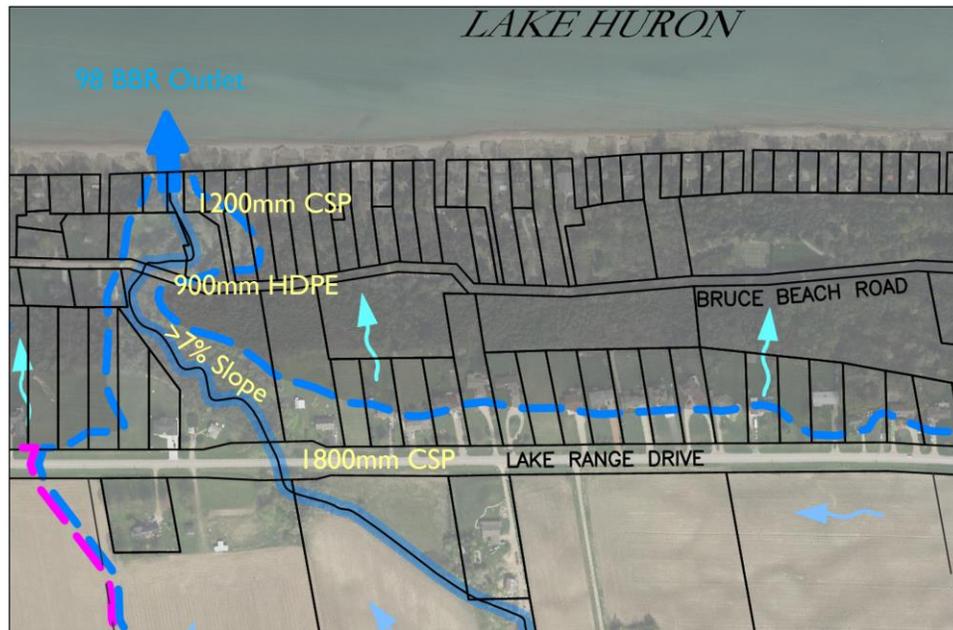


3. The elevation difference between the ravine at Lake Range Drive, and the beach at Lake Huron is approximately 23 metres, with close to 20 metres of the elevation change occurring between Lake Range Drive and Bruce Beach Road. The approximate distance from the road crossing at Lake Range Drive to the road crossing at Bruce Beach Road is 270 metres.
4. The ravine is experiencing high levels of erosion and is prone to blockages from fallen trees.
5. The overland slopes of the catchment area are relatively steep and tend to produce fast and large peak flows followed by a somewhat quick recession to no flow.
6. The area on Lot 43, Concession Lake Range between Lake Range Drive and the existing private drainage ditch is an irregularly shaped field of relatively small size and is not being used for the same crop production as the remaining portion of the property.
7. This watershed has experienced significant storm events in the last several years which have caused considerable damage to both private and public property, including road infrastructure.
8. The Bruce Beach area requires modifications to its existing drainage system to increase the safety of the public, and the public's property.
9. The Ontario Ministry of Agriculture, Food and Rural Affairs' Agricultural Information Atlas describes the soil types within the watershed and along the route of the drain as clay loam.

The existing configuration consists of the following in an upstream to downstream direction.

- Drainage ditch
- 1800mm diameter culvert across Lake Range Drive
- Erosion prone ravine with an average grade of approximately 7% (approximate 20 metres of fall)
- 900mm diameter culvert across Bruce Beach Road
- 1200mm diameter culvert across two cottage properties
- Beach of Lake Huron

The below image is included to assist in understanding the existing drainage configuration.



3.0 DRAINAGE ACT AUTHORIZATION

The Council of Huron-Kinloss received a petition under Section 4(1)(c) of the Drainage Act, signed by the Director of Public Works from the Township of Huron-Kinloss. Authority to proceed under the Drainage Act was obtained by a resolution of the Township of Huron-Kinloss Council at its November 19, 2018 meeting to appoint Dietrich Engineering Limited to prepare an Engineer's Report.

On May 3, 2021, the Council of the Township adjusted its appointment of the Engineer to reflect Headway Engineering as the new appointee per Section 8(2) of the Drainage Act.

The petition is valid in compliance with Section 4(1)(c) of the Drainage Act, R.S.O. 1990.

4.0 DESIGN CONSIDERATIONS

4.1 Detention Facility

The watershed east of Lake Range Drive naturally drains toward the upper end of the ravine where the existing crossing is below Lake Range Drive. Although the watershed naturally drains to this location, constructed features exist that improve conveyance toward the ravine, but also toward the Pollock Municipal Drain which drains south. Runoff flows into the ravine in an uncontrolled manner. Large rainfall events are conveyed downstream, with haste, into a ravine with approximately 20 metres of fall, where the topography then levels (relative to the ravine). Bruce Beach Road and several residences are in this vicinity. The existing hydraulic condition from Bruce Beach Road to Lake Huron is not capable of safely conveying flows generated from large rainfall events.

The proposed detention facility is situated just east of Lake Range Drive which takes advantage of the natural 'confluenceing' properties of the watershed. Runoff continues to flow overland into the detention facility in the same uncontrolled manner that currently exists and is released downstream to the Ravine at a flow rate significantly less than the peak overland inflow rate. The reduced flow



rate is controlled by the detention facility's outlet structure. The balance of runoff is stored in the detention facility.

Hydrologic modelling was carried out to represent the detailed drainage characteristics of the watershed. A 'proposed conditions' model was prepared to design the detention facility and assesses the impacts the changes would have on downstream lands. The detention facility was modeled for the 2, 5, 10, 25, 50, and 100-year rainfall events.

The conveyance system from Bruce Beach Road, downstream to Lake Huron can safely convey the controlled outflow rates from the detention facility for large rainfall events.

Specific design considerations include:

- Outflow rates from the detention facility that can safely be conveyed by downstream infrastructure
- Storage capacity in the detention facility to temporarily contain flows generated by the 100-year rainfall event
- Topographic and construction constraints to ultimately allow for improved land use during dry conditions.

4.2 Ravine

The ravine is experiencing large amounts of erosion for both large and small rainfall events. A hydraulic model was prepared to determine the depth of flow which would produce channel shear causing particle movement in the ravine. The hydraulic model was then used to compute the expected existing condition results from observed rainfall data for a two-year period. The model was duplicated and modified to compute the expected proposed condition (with a detention facility) results from the same observed rainfall data for the two-year period. The results are summarized as follows:

- Cumulative channel shear is marginally reduced by the construction of a detention facility
- Cumulative channel shear in excess of threshold shear is marginally increased by the construction of a detention facility
- Cumulative duration of channel shear in excess of the threshold shear is marginally increased by the construction of a detention facility

In conclusion, although the detention facility greatly increases the safety factor against flooding for downstream portions of the drainage system, the safety factor against erosion in the ravine is essentially unaffected. In other words, the ravine is expected to erode at the same long-term pace, which is currently observed. This is attributed to the inherently low shear resistance of the soil in the ravine, coupled with extreme grades.

Design solutions include reducing the amount of flow travelling on the streambed of the ravine, increasing the shear resistance of the soil in the ravine, or a combination thereof. In this case, a hybridization of both principles is recommended.

A pipe system is proposed to convey most flow, while small flows will use the proposed rip-rap lined swale in the ravine.



5.0 ENVIRONMENTAL CONSIDERATIONS

The Department of Fisheries and Oceans (DFO) has reviewed the proposed design and has completed a site visit. DFO provided correspondence to the Township dated April 2, 2020, which states the following:

“... the Program is of the view that your proposal will not require an authorization under the Fisheries Act.”

The Saugeen Valley Conservation Authority (SVCA) has been invited to all public meetings and has been contacted directly on several occasions. The SVCA has indicated that a permit to Alter a Watercourse is required for the proposed ravine works. The SVCA has also provided correspondence to the Township dated March 7, 2021, which states the following:

“... the proposed design is generally acceptable to SVCA staff.”

The work proposed includes the attenuation of stormwater flows and improvements to downstream infrastructure for the primary purpose of improving the safety of the public. Consequently, the attenuation of peak stormwater flows tends to improve water quality.

6.0 EMERGENCY DESIGNATION MATTERS

This section of the application is in reference to the guidelines for Authorization of Emergency Work provided by OMAFRA.

6.1 Description of the Problem and the Solution

The existing drainage infrastructure comprises of a relatively large drainage basin with moderate grade that outlets into a ravine. The substrate material of the ravine is highly erodible with an incredibly low shear threshold, and a tree canopy that prevents adequate sunlight to allow for mixed rooted vegetation. The ravine outlets at a location just upstream of Bruce Beach Road where the grade flattens substantially relative to the ravine.

Hydraulically speaking, the ravine hastens an already very hydrologically responsive watershed (flashy system). That hastened stormflow is discharged onto a location of inadequate capacity, causing flooding.

The hydraulic acceleration caused by the ravine would necessitate an extremely large diameter pipe downstream of Bruce Beach Road. High lake levels and the wave actions prevent sufficient outlet at the beach for large diameter pipes. The proximity of cottages and houses prevents the construction of an open system all the way to the beach, and the removal of dwellings from the beachfront is economically irresponsible.

Additionally, the vegetation in the ravine produces large woody debris which frequently plugs the culvert at Bruce Beach Road and the culvert downstream of Bruce Beach Road. This effect further reduces the hydraulic capacity of the lower system.

The engineered solution is the attenuation of stormwater flowrates to controlled levels which can be conveyed with realistic downstream infrastructure. The design consists of the construction of a detention facility east of Lake Range Drive. The location of the facility is selected to take advantage of the natural ‘dish shape’ of the landscape in this location, and its necessity to be upstream of the at-risk locations.



The improvements to the ravine include brushing and debris removal on the surface, and the installation of a pipe system. The primary form of conveyance from Lake Range Road to Bruce Beach Road will be the pipe system to prevent blockages by woody debris. The secondary form of conveyance will be surface flow using a rip-rap lined swale in a canopy free setting to encourage mixed rooted vegetation.

Additional benefits of the proposal include the creation of agricultural land use. The detention facility is design to be dry, other than during and immediately after rainfall events. Additionally, the side slopes to the east of the facility shall be gradual to allow the footprint of the detention facility to be workable for agricultural productivity. Currently, the area where the detention facility is proposed is diagonally severed by a drainage ditch, creating an irregularly shaped wedge of land that is too onerous to be productive. The detention facility also creates agricultural land use where the existing drainage ditch transitions into the ravine.

6.2 Health and Safety Concerns

The flood of the summer of 2020 demonstrates the threats to public health and safety. Please refer to Appendix A for photos of the August 16, 2020 flood. Below is a secured link to videos taken by landowners during the event (the link is repeated in Appendix A). It is strongly encouraged that the Minister and the Coordinator view some of the short videos to add context.

Secured Folder with Video Content:
Link: [BBR Emergency Desg. Videos](#)
Password: vK8fBs2#B6G0

6.3 Degree of Safety Concerns

The summer 2020 event demonstrates the threat to life and property safety. Severe damage was experienced on 98 Bruce Beach Road, 726 Lake Range Drive (ravine property), and Bruce Beach Road. 94, 95, 94-2, 95-2, 96 and 97, all of Bruce Beach Road experienced significant damage, however not to the same degree as the above noted properties. The Landowner of 94-2 noted that had the water level around his house been one inch higher, his house would have been flooded. One of the videos included in the Appendix A secured link demonstrates this. 101 and 102 of Bruce Beach Road experienced flooding inconvenience.

The summer of 2020 event equated to approximately a 100-year rainfall event, however, engineering studies indicate that Bruce Beach Road is susceptible to failure during a 25 year rainfall event.

6.4 Action Taken by the Municipality and the Progress/Pace of the Engineer

The following table describes the actions that were taken by the Township and the engineer.

Date(s)	Action	Description
Summer 2018		Rainfall event causing flooding of Bruce Beach Road and private property
Fall 2018	Township signs petition	Township recognized that Bruce Beach Road requires drainage and private properties are susceptible to damage during large events.



	Township appoints an Engineer	<p>After exploration of options, and recognition that the existing drainage system is nearly entirely on private property, the Township acknowledges that it is restricted by what it can do.</p> <p>The Township initiates a drainage petition (Section 4(1)(c)) to begin the Drainage Act process to mitigate the problem</p>
February 2019	Council Delegation	The Engineer presented several conceptual design solutions to ‘kick off’ the project and open dialogue.
April to May 2019	Township introduces online engagement platform	The Township designates a portion of its online public engagement website to welcome comments, feedback and ideas from the public
May 2019	Township hosts Public Open House	The Engineer was present at a public open house to obtain more information from the public using a different forum of communication (live meeting).
September to November 2019	Township reboots online engagement platform	The Township provides an update to the public and presents new information developed by the Engineer . Information included design recommendations, preliminary cost estimates and assessments.
October 2019	Council Delegation	The Engineer revisited previously presented concepts, summarized public input, discussed design recommendations, and preliminary cost estimates and assessments.
November 2019	Township hosts Public Open House	The Engineer was present at a public open house to receive input and feedback on the previously circulated design recommendations and preliminary estimates.
March 2020	<p>COVID-19</p> <p>Engineer assesses erosion threshold of ravine</p>	<p>New and unexpected restrictions caused by the COVID-19 pandemic came into effect (limitations on gathering sizes - this project has about 200 Landowners affected).</p> <p>The Engineer obtained observed rainfall data from the conservation authority for a two year period. The Engineer determined the erosion threshold of the ravine substrate</p> <p>The Engineer then assessed the changes caused by the proposed design using the previous two years of rainfall data provided by the CA.</p>



August 2020	100-Year flood	The threat to public safety and property is demonstrated
September 2020	Township and Engineer identify need to expedite project	Township Staff and the Engineer meet to identify the risk to property, and to develop options to protect the public more quickly. Staff and the Engineer worked quickly to de-scope the project and focus on a phased approach to produce a report more quickly and cause construction of the most critical design components (detention facility and ravine improvements).
November 2020	Township hosts meeting with Landowners directly affected by Detention Facility	Due to the large number of Landowners affected (approx. 200), the previously held Public Open Houses may have discourage the participation of the minority agricultural landowners directly affected by the detention facility. As such, the Township and the Engineer organized a meeting with only the landowners affected by the detention facility. The purpose of the meeting was to receive direct input and feedback relating to the design. At this meeting, it was also noted by the CA that the Ravine works require a geotechnical review.
December 2020 to January 2021	Engineer sub-contracts geotechnical engineer to assess ravine soils Engineer provides draft report Engineer submits preliminary design to CA	A geo-technical engineer completed a review of the design drawings and conducted a site visit. The geo-technical engineer provided a design review report. The Engineer prepared a draft report for the Township's review and comment. The Engineer submitted the design drawings to the CA to kickstart the CA's review of the ravine design.
February to March 2021	Engineer to adjust design Engineer submit to CA for approval in principal	The Engineer included minor adjustments to the design based on recommendations from the geotechnical engineer. The Engineer then resubmitted the design drawings, along with the geotechnical report. The Engineer hosted a virtual meeting with the CA and received approval in principle.
April and May 2021	Employment adjustments	Due to employment changes, the Township identified the need to modify its Engineer's appointment to reduce barriers to progress.



	<p>Township adjusts Appointment</p> <p>Transition between Engineering firms</p>	
May 2021	<p>Engineer (along with Township) hosts meetings with Landowners affected by flooding</p>	<p>Moving closer to a report, the Engineer and the Township identified the need to meet with downstream landowners to explain design and process details.</p> <p>Design edits to the outlet are required to properly address needs of downstream landowners</p>
June 2021	<p>Township and Engineer identify need to apply for Emergency Designation</p>	<p>The Drainage Act process for producing a bylaw is discussed below.</p>
June 11, 2021	<p>Township submits Application for Emergency Designation</p>	<p>Township Staff and the Engineer prepared a detailed application for Emergency Designation for the detention facility portion of the overall project</p>
June 29, 2021	<p>Minister's decision regarding Emergency Designation</p>	<p>The Minister decided to not proceed with an emergency designation at this time but required OMAFRA staff to reach out to the Township for further options.</p>
July 8, 2021	<p>Engineer files the Drainage Report for Phase I</p>	<p>The Engineer filed a report for the first phase of the project including the construction of the detention facility and rehabilitation of the ravine.</p> <p>The second phase includes a permanent outlet to Lake Huron.</p>
July 19, 2021	<p>Council considers the report and passes the provisional by-law</p>	<p>The Engineer presented the report to Council, and the provisional by-law was given first and second reading.</p>
July 20, 2021	<p>Township circulates the provisional by-law and a notice of the Court of Revision</p>	<p>The Township staff circulated the notice of the Court of Revision and the provisional by-law to the affected landowners and agencies (including OMAFRA).</p>
August 9, 2021	<p>Court of Revision</p>	<p>The Court of revision was held, and decisions were delivered.</p>
August 12, 2021	<p>Township closed tenders for construction</p>	<p>The Township closed tenders for the construction of the Bruce Beach Drain – Phase I. Two bids were received.</p>



		A completion date for construction was specified for December 31, 2021.
August 16, 2021	Council awarded the contract for construction	The Council provisionally awarded the contract for the construction of Phase I of the drain. The award is conditional on no design/engineering appeals being received (Section 48).

7.0 CLOSING ARGUMENTS

The Township and the Engineer understands the Minister’s special authority to authorize emergency work before a report is completed. The Township and the Engineer also appreciates the Minister’s responsibility to weigh the true merits of an emergency against the rights of those who could become appellants. It is a difficult and uncertain decision to make, with potentially dangerous consequences. The Township and the Engineer want to reassure the Minister and the Coordinator that an Emergency Designation for the Bruce Beach Drain – Phase I is appropriate and required.

With reference to Section 124 of the Drainage Act, the test of an Emergency Designation is paraphrased as follows:

- Does an Emergency exist?
- Has Council authorized Emergency work?
- Is the project a Drainage Act project?
- Are the generic Drainage Act Processes out of balance when weighing public safety and appeal rights?

7.1 Does an Emergency Exist?

The Bruce Beach area is in a condition of urgent need for assistance. A serious occurrence like what happened recently needs immediate protection; it could unexpectedly happen again. **Since the previous submission for Emergency Designation, Bruce Beach Road has come within inches of a washout on two occasions.** The degree and extent of risk to public life and property is made obvious by the supporting materials.

7.2 Has Council authorized Emergency work?

On June 7th, the Township of Huron-Kinloss Council passed a resolution moving forward with an application for Emergency Order with the Drainage Act for the Bruce Beach Municipal Drain Project.

7.3 Is the Project a Drainage Act project?

The project is a Drainage Act project, authorized by petition under Section 4(1)(c).

7.4 Are the Drainage Act Processes out of balance when weighing public safety with appeal rights?

The generic Drainage Act Processes of preparing a report, considering the report, dealing with all possible appeals, and finally passing a by-law to authorize construction, is an incredibly valuable process for most drainage systems; especially systems for improving the productivity of land, or enabling some form of developed use for land. **In the case of the Bruce Beach project, the safety of the public is potentially endangered by this generic Drainage Act process.** Critical components of the design are exposed to delays caused by assessment appeals.



The best available option for the Township to administer a drainage solution on private property is to use the Drainage Act. With respect to the pace of the project, the system is complex, and conventional drainage design has no place in the solution. Couple a complicated and unconventional design, with a large group of landowners consisting of agricultural lands, permanent residents, and seasonal cottage owners, extensive public consultation and involvement is required. With reference to the provincial statistics for the timelines on completing reports (Practitioner’s meeting, OMAFRA report, 2017) a report for this project would be expected well after five years of the appointment of the Engineer. The Bruce Beach report was prepared in two and a half years.

In conclusion, the Township is seeking an Emergency Designation from the Minister to protect the people and their property in the Bruce Beach area. The Township and the Engineer appreciate that there are other components of the design which are required to fulfil the Engineer’s duty under the Drainage Act, and therefore must be included in the Phase II drainage report. However, they are not required to immediately remedy reduced safety.

The Township has acted swiftly in taking actions to mitigate the serious risks. Together, the Township and the Engineer de-scoped the project to its essentials within a couple weeks of the 2020 flood to quicken the pace of the planning work. With a focus on just the critical components, the Engineer was able to finetune the design and meet with those directly affected to produce a design that is supported, while greatly reducing the likelihood of appeals (to these critical components). The Engineer navigated the approvals processes with DFO and the CA to receive approvals for the proposal.

The Township asks the Minister to grant an Emergency Designation to increase public safety while still granting assessment appeal rights for the Bruce Beach Drain – Phase I.

If OMAFRA has any questions regarding this application, or any difficulty in accessing the supporting documentation, please contact the following.

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Project Manager/Engineer
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(226) 243 6614

-or-

Grant Collins
Drainage Superintendent
Township of Huron Kinloss
gcollins@huronkinloss.com
(519) 441 8818

Appendix A

Photos

Secured Folder of Video Content:
Link: [BBR Emergency Desg. Videos](#)
Password: vK8fBs2#B6GO



98 Bruce Beach Road – Flooding in backyard (road side of yard) including damage to garage.



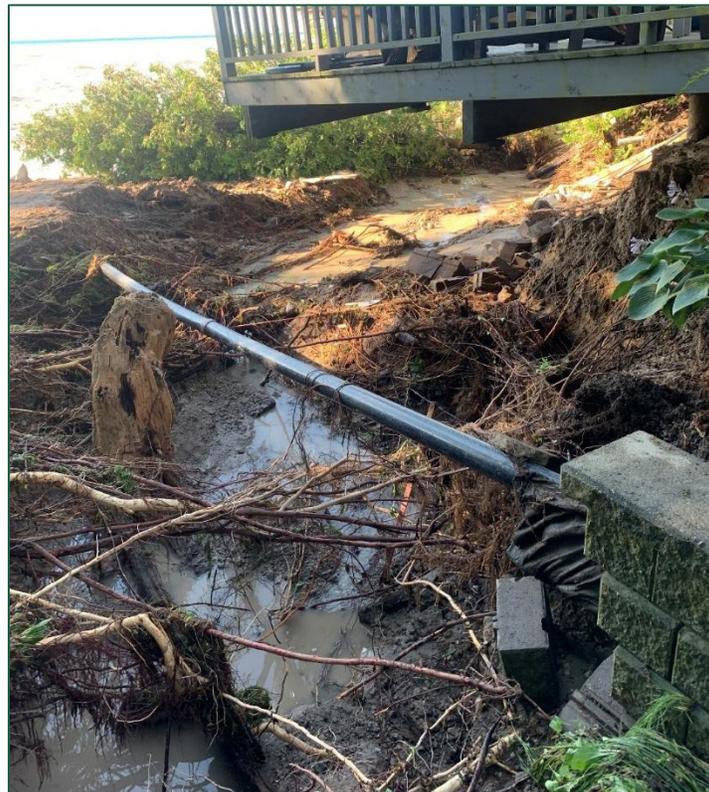
98 Bruce Beach Road – Front Yard (Lake Side) 2014 (above)



98 Bruce Beach Road – Front Yard (Lake Side) after flood



98 Bruce Beach Road – Side yard



98 Bruce Beach Road – Side yard damage



Bruce Beach Road (Ravine to left, Lake to right)



95-2 Bruce Beach Road – Back yard



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Appendix B

**Details of Public Consultations
(Not amended since first
submission)**



Public Meetings, Engagements and Participation

This section of the application is included to demonstrate to the Minister and the Drainage Coordinator the extent to which the public has been informed and involved. The Township has exercised extensive effort to maintain open dialogue, encourage public participation, and sustain transparency throughout the engineering and Drainage Act processes.

HaveYourSayHK website open for public input – April 5 to May 4, 2019

The Township of Huron-Kinloss used their online public engagement website for the Bruce Beach drainage project beginning in March 2019. Information posted included background discussion of the Drainage Petition, discussion and images of several design concepts, and a high-level plan for moving forward to solve the drainage problems.

The Township initiated public participation using the website from April 5 to May 4, 2019. Over that period, the website received:

- 234 page visits/views
- 11 ‘stories’ submitted using the ‘Story Telling Tool’ – an online tool for members of the public to post their thoughts, and
- 13 questions

Public Open House Number 1 (On-Site Meeting) – May 25, 2019

In accordance with Section 9(1) of the Drainage Act, R.S.O. 1990, an on-site meeting was held on May 25, 2019. The place of meeting was at the Point Clark Community Centre. Persons in attendance were:

Engineering Staff	3 members
Township Staff	4 members
Township Councillors	5 members
Landowners	53

The primary purpose of this meeting was for the Engineer to obtain as much information as possible from the public to begin preparing a practical design solution. In addition to receiving public input, the meeting provided a review of design concepts, and input received through the *HaveYourSayHK* website.

HaveYourSayHK website open for Public Input – September to November 22, 2019

The Township of Huron-Kinloss updated their online engagement website for the Bruce Beach drainage project by posting additional information in October 2019. The information included a review of design concepts and public input, more detailed discussion of design recommendations, and preliminary cost estimates and assessments.

As of November 24, 2019, the cumulative website activity (from commencement) was as follows:

- Approximately 1,400 page visits/views
- 36 ‘stories’ submitted using the ‘Story Telling Tool’, and
- 13 questions (no change from the previous website report)



Public Open House Number 2 (Information Meeting) – November 30, 2019

An information meeting was held on November 30, 2019 at the Point Clark Community Centre. Persons in attendance were:

Engineering Staff	3 members
Township Staff	4 members
Township Councillors	5 members
Conservation Authority Staff	1 member
Landowners	35

The information provided proposed constructing a drainage system to mitigate the drainage problems affecting the area where the ravine crosses Bruce Beach Road. This meeting provided a review of the design of the proposed drainage system, the estimated costs of the project and proposed assessments.

The recommended drainage system for the included the construction of a detention area located on private property east of Lank Range Drive. The outlet for the detention area was proposed to be the existing ravine in its current state, then through a culvert across Bruce Beach Road, and finally through an existing open ditch and existing pipe system ending on 98 Bruce Beach Road. The outlet for the system is Lake Huron. No work was proposed downstream of Bruce Beach Road, however allowances to landowners for the use and incorporation of the existing pipe drainage system were accounted for.

Council Meeting Delegations

Kick-off and Conceptual Design Discussion - February 11, 2019

Dietrich Engineering Limited attended the February 11, 2019 Council Meeting to present information on the hydrologic construction of the Bruce Beach area. The discussion included a brief introduction to the existing outlets into Lake Huron, and the approximate watersheds using these outlets. Dietrich Engineering Limited also presented a high-level plan on advancing the project forward, and for discussion purposes, developed several conceptual design solutions.

Preliminary Design Recommendations and Discussion - October 21, 2019

Dietrich Engineering Limited attended the October 21, 2019 Council Meeting to provide a review of the findings, and the previously presented concepts, and a summary of the public input received so far. Dietrich Engineering Limited went on to present design recommendations, preliminary cost estimates and assessments.

Project Phasing Discussions (to expedite the construction of critical design components) - October 14, 2020

Dietrich Engineering Limited attended the October 14, 2020 Council Meeting to provide Council with an update on the project, and to **discuss potential phasing options which will allow for the construction of the most critical components of the design as soon as possible to increase the safety to the public.** A description of the possible phasing of the project is as follows:

1) Phase I



Phase I includes the construction of the detention facility east of Lake Range Drive; the Lake Range Drive road crossing; and improvements to the ravine downstream of Lake Range Drive to Bruce Beach Road.

2) Phase II

Phase II includes the construction of a drainage system directly affecting properties on the east side of Bruce Beach Road between Concession 8 Road and the ravine, and an outlet to Lake Huron.

Meeting with Landowners Affected by Detention Facility Construction – November 11, 2020

A meeting was held on November 11, 2020 at the Ripley Huron Community Centre. Persons in attendance were:

Engineering Staff	2 members
Township Staff	3 members
Conservation Authority Staff	1 member
Landowners	1

The information provided proposed constructing a drainage system to mitigate the drainage problems affecting the area where the ravine crosses Bruce Beach Road. This meeting provided a review of the design of the proposed drainage system, the estimated costs of the project and proposed assessments.

The recommended drainage system for the included the construction of a detention area located on private property east of Lank Range Drive. The outlet for the detention area was proposed to be the ravine, however, in an improved state, then through a culvert across Bruce Beach Road, and finally through an existing open ditch and existing pipe system ending on 98 Bruce Beach Road. The outlet for the system is Lake Huron. No work was proposed downstream of Bruce Beach Road, however allowances to landowners for the use and incorporation of the existing pipe drainage system were accounted for.

Meetings with Landowners Affected by Downstream works – May 20th, and 21st, 2021

Meetings were held on May 20th and 21st, 2021 at a private residence (May 20) and virtually (May 21). Persons in attendance were:

Engineering Staff	1 member
Township Staff	1 member
Landowners	3

The information provided proposed constructing a drainage system to mitigate the drainage problems affecting the area where the ravine crosses Bruce Beach Road. This meeting provided a review of the design of the proposed drainage system, the estimated costs of the project and proposed assessments.

The recommended drainage system for the included the construction of a detention area located on private property east of Lank Range Drive. The outlet for the detention area was proposed to be the ravine, however, in an improved state, then through a culvert across Bruce Beach Road, and finally through an existing open ditch and existing pipe system ending on 98 Bruce Beach Road. The outlet for the system is Lake Huron. No work was proposed downstream of Bruce



Beach Road, however allowances to landowners for the use and incorporation of the existing pipe drainage system were accounted for.