



# The Town of Niagara-On-The-Lake

Operations  
Telephone (905) 468-4261  
Facsimile (905) 468-4555

1565 Creek Road  
P.O. Box 190  
Virgil, Ontario  
L0S 1T0

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**Report:** OPS-18-012 **Committee Date:** April 09, 2018

**Due in Council:** April 16, 2018

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**Report To:** Operations Advisory Committee  
**Subject:** Dock Area - Flood Prevention Measures

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## 1. RECOMMENDATION

It is respectfully recommended that

- 1.1 Council authorize Staff to move forward with implementing preventive measures to deal with anticipated flooding due to high Lake Ontario water levels, and
- 1.2 All costs associated with the preventative measures to be taken, be funded from the Dock Area Reserve.

## 2. PURPOSE / PROPOSAL

To advise Council of Staff's recommendations on the dock area flooding in anticipation of high Lake Ontario water levels. Staff are focusing on minimising the backwater effects of the rising waters through storm sewer check valves as the first measure necessary to be purchased and installed.

## 3. BACKGROUND

June 12, 2017 Council approved Staff report OPS-17-039 that outlined the challenges with the high water level of Lake Ontario. This report also identified the emergency measures that were put in place to alleviate damage to Municipal property and outlined funding sources to cover the required expenditures. A copy of the report is attached.

Environment Canada has indicated that high water levels for Lake Ontario could continue to be high again this spring with water levels potentially higher than 2017.

After reviewing this data and investigating other US Government related data Staff are recommending that we put measures in place to protect the shoreline residents in a staged process.

#### **4. DISCUSSION / ANALYSIS**

There has been various conversations with the public and town staff to investigate alternative methods of dealing with the potential of rising waters in and along the Niagara River and Lake Ontario.

Last year our contractor installed white meter bags along the waterfront which was effective but difficult to install and to remove. This also came with other concerns on where to put the material from within the bags after the waters had receded. Removal of these bags was difficult as they tore apart as a result of the weight of the bags being saturated and the straps being sewn on the side. The town has been sourcing various suppliers for heavier reinforced bag so they can be installed and removed without the worry of tearing. The River Beach Parking Lot will be used as a staging area for the materials and the location to fill the bags.

In 2017 the Town also had to retain divers to install sewer plugs to stop the Niagara River from back flooding into the storm sewer. This work was completed after the water had risen to a depth that the plugs could only be installed by commercial divers. This year staff investigated a number of options and have sourced a company called WAPRO who has a one way check valve that can be installed into the pipes so that water can only go one way in the pipe. This will allow staff to install a pump into the manhole to continue to remove water from the system which was found to be below the lake high water level.

Staff will continue to investigate options surrounding various pumps as an alternative to diesel pumps. The diesel pumps were very effective and relatively quiet however the adjacent properties did insist that the noise was unbearable. The diesel pumps also required a fair amount of maintenance including fuelling seven days per week. The challenge Staff may have is providing the appropriate cost effective hydro service required to run the pumps at each of the required locations.

#### **5. STRATEGIC PLAN**

#### **6. OPTIONS**

None available at this time

#### **7. FINANCIAL IMPLICATIONS**

The following table outlines the estimated cost to install various preventive measures. Staff have estimated the cost to provide Council with a rough guide on anticipated costs moving forward. The cost of the running and maintaining the pumps are not included below as the options are so varied and staff are still investigating.

	Plan Area #1 Ball Street	Plan Area #2 Melville Street	Plan Area #3 Ricardo Street	Plan Area #4 River beach Drive Storage	Total Funding
Check Valves	\$25,000	\$25,000	\$25,000		\$75,000
Meter Bags				\$4,000	\$4,000
Granular A				\$15,000	\$15,000
Rip Rap				\$15,000	\$15,000
Staffing & Contracts	\$6,500	\$6,500	\$6,500	\$6,500	\$26,000
Contingency	\$5,000	\$5,000	\$5,000	\$15,000	\$30,000
Total					\$165,000

Funds were not included in the 2018 Budget to cover these expenditures, however the treasurer has indicated that these funds will be required to be taken from the Dock Area Reserve.

The balance of the Dock Area Reserve as at December 31, 2017 is approximately \$391,000 (subject to 2017 year end results). After expenses of \$165,000 there will be a balance of \$226,000.

## 8. COMMUNICATIONS

Staff will continue to update the Public through social media, working groups and the Town's website.

Staff have had one initial meeting and is scheduled to have another meeting with residents regarding the shoreline protection plan in the coming weeks.

## 9. CONCLUSION

Elevations of the Niagara River and Lake Ontario are truly a wild card of which way the water will be handled, if and when it becomes an issue. Staff are working toward implementing methods that can be sustainable for longer periods of time and so that works can be minimised and thereby not being so reactive in nature.

**Respectfully submitted,**



**Brett Ruck**  
**Environmental Services Supervisor**



**Sheldon Randall**  
**Director of Operations**



**Holly Dowd**  
**Chief Administrative Officer**

ATTACHMENTS



OPS-17-039.pdf

WEB ATTACHMENTS

ATTACHMENTS FOR LINK

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First Capital of Upper Canada - 1792



# The Town of Niagara-On-The-Lake

Operations  
Telephone (905) 468-4261  
Facsimile (905) 468-4555

1565 Creek Road  
P.O. Box 190  
Virgil, Ontario  
L0S 1T0

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**Report:** OPS-17-039 **Committee Date:** June 05, 2017

**Due in Council:** June 12, 2017

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**Report To:** Operations Advisory Committee  
**Subject:** Dock Area Flooding

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## 1. RECOMMENDATION

It is respectfully recommended

- 1.1 that Council approve the hiring of Shoreplan Engineering Limited to assist in improving shoreline protection at the dock area, with funds being used from the Dock Area Reserve, not exceeding \$50,000; and
- 1.2 that Council approve all costs related to the protection and repair due to the high water level be charged to the Dock Area Reserve.

## 2. PURPOSE / PROPOSAL

The purpose of this report is to provide Council with an update regarding the recent dock area flooding and to examine effective permanent solutions to prevent future erosion.

## 3. BACKGROUND

During the week of May 8 2017, Staff were notified of high water levels at the Ricardo St. Regional Pumping Station and also observed flooding on Ricardo St. in front of Kings Point Condominiums. Further investigation from Town Staff determined that the high-water level of Lake Ontario was surcharging the area storm system preventing the storm sewers from draining. As the storm system continued to back up, the high-water level was causing extreme pressure around the sanitary sewers resulting in infiltration to the system. Further investigation of the area storm system confirmed that all three outlets in the area were being surcharged due to the high-water level of the lake preventing the system from working properly.

Staff were also advised on May 24, 2017 by the NPCA that the water level in Lake Ontario is presently at 75.86m. This is the highest water level recorded since 1918. Lake Ontario water levels are expected to continue to rise slightly through May.

On Wednesday May 24, Senior Operations Staff and the CAO toured the site with

MPP Wayne Gates and a staff member to review the area damage and to advise of the Town's physical and financial challenges with the high water levels. Our MPP was surprised with the amount of damage that has taken place and was also impressed with the measures put in place to lower the water levels to minimize additional damage to private properties. Our MPP is committed to assisting the Town in seeking financial relief for the Dock Area.

#### 4. DISCUSSION / ANALYSIS

Immediate action was required to alleviate the sewage concern and staff engaged the services of a vacuum truck to assist the Region with pumping down the sanitary sewer. The sewage was then transferred to the Regional Waste Facility for proper disposal. This process was active for about 5 days and is still required periodically until the lake levels subside.

Additional action was also required to prevent the lake from backing up into the storm system. Staff also engaged a contractor and certified divers to install plugs in two storm outlets and one major storm line on Ricardo St. Once the plugs were installed three 6" pumps were installed to pump the water out of the storm system and out to the lake. These pumps are set up to run 24 hours per day and will need to be in place and monitored daily to ensure they are functioning properly until the lake level subsides. The pumps that are installed are relatively quiet and a minimal disturbance considering the situation.

With the water level being so high the wave action of the lake has started to cause major erosion in the Dock Area. Staff have also engaged the same contractor to provide temporary erosion protection by placing large meter bags along affected areas of the shore line. This process is temporary and staff will need to engage a Consultant to provide an effective permanent solution to the erosion in the Dock Area. In some locations we have installed larger quantities of Rip Rap and filter cloth and we are hoping that it will remain as part of the permanent erosion solution. A drawing showing the described locations is included as Appendix B.

The following table outlines the estimated expenditures to date as well as a projection of estimated costs based on the water level receding by the end of August.

<b>Dock Area Cost Estimate</b>	<b>Estimated</b>	
Cost to May 20th for Materials and Labour for Contractor (Includes meter bags, Rip-Rap, sand, Bags, small pumps)	\$205,725	
Vacuum Pumping	\$15,000	
Storm Sewer Plugs	\$3,000	
Installation By Certified Divers	\$3,300	

Pump Rentals May 21 to 27	\$8,000	
Pump 24 Hour Operation	\$1,950	
Operational Contract Crews (on going erosion control and emergency small pump operation)	\$25,000	
Pump ongoing Rental, Maintaince and Fuel (\$13,110 x3) \$39,330 Per Month	\$117,000	<i>By end of August</i>
Re Location of meter bags from Wellington to Dock Area	\$25,680	<i>By end of May</i>
Shoreline at Jet Boats (Rip Rap Shoreline)	\$18,000	<i>By end of May</i>
Queens Royal Beach (Rip Rap Shoreline)	\$12,000	<i>By end of May</i>
Shoreplan Engineering	\$50,000	<i>By end of August</i>
Park Area Restoration	\$30,000	<i>By end of August</i>
Town Staff Time	\$20,000	<i>By end of August</i>
	<b>\$534,655</b>	<b>Total Estimate</b>

Staff has consulted with Shoreplan Engineering Limited asking for a cost proposal to design a retaining and break wall system to prevent future erosion and remediation of the existing damage (see Appendix A). Shoreplan is very familiar with this area and have also provided area residents successful engineering plans. The estimate cost for this work is \$39,000.00 and staff are recommending that we move forward with this project. Additional funds may be required to facilitate additional public engagement but we are not anticipating the total cost of the engineering to exceed \$50,000. The proposal meets the intent of the Town's Procurement Policy.

Once a engineering design and specification is complete Staff will request qualified contractors to provide quotes to carry out this work. Staff will then report back to Council with a recommendation to move forward.

## 5. STRATEGIC PLAN

N/A

## 6. OPTIONS

1. that Council approve the hiring of Shoreplan Engineering Limited to assist in improving shoreline protection at the dock area, with funds being used from the Dock Area Reserve, not exceeding \$50,000; and approve all costs related to the protection and repair due to the high water level be charged to the Dock Area Reserve.  
(recommended)

## 7. FINANCIAL IMPLICATIONS

The costs for the Dock Area flooding was not included in the 2017 Budget. Staff is recommending that the expenditures be funded from the Dock Area Reserve. There is currently a balance of \$750,000 in this reserve.

Staff will continue to source potential funding relief through Government Agencies.

## 8. COMMUNICATIONS

Staff will continue to update residents via social media and the Town's Website. We will also provide regular updates to Council when any major changes take place.

## 9. CONCLUSION

Staff recommend that Council approve Shoreplan Engineering Limited proposal to assist in improve shoreline protection at the dock area. Staff will continue monitor and implement measures to minimise damage to property and associated costs will also be charged to the Dock Area Reserve.

Respectfully submitted,



**Sheldon Randall**  
Director of Operations



**Holly Dowd**  
Chief Administrative Officer

### ATTACHMENTS



Appendix A- Shoreplan Proposal.pdf



Appendix B- Dock Area Map.pdf



IMG\_1544.JPG



IMG\_1527.JPG



IMG\_1558.JPG



IMG\_1457.JPG



IMG\_1524.JPG



IMG\_1529.JPG



IMG\_1535.JPG

WEB ATTACHMENTS

ATTACHMENTS FOR LINK

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## ***Proposal***

**SHOREPLAN**

**To:** Sheldon Randall, Director of Operations  
Town of Niagara-on-the-Lake  
1593 Four Mile Creek Road  
PO Box 100  
Virgil, Ontario L0S 1T0

**Email:** [srandall@notl.org](mailto:srandall@notl.org)

**From:** J. Graham, P. Eng.

**Date:** May 17, 2017

**Re:** Waterfront Parklands Link - Shore Protection Design  
Our Proposal File: 17-2603

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Dear Mr Randall

Further to recent our meeting, we understand that the Town of Niagara-on-the-Lake requires design of shoreline protection improvements along the park shoreline between 25 Delater Street and 85 River Beach Road. The park shoreline is eroding and a historical outlet is vulnerable to wave action. Recent storm events have caused flooding in the back shore. We understand that the Town wishes to improve the park shoreline protection while maintaining the existing headland bay system and trees in the park as much as possible. We have not been provided terms of reference for this project. Based on our discussions we propose the following tasks:

1. We will visit the site and complete a visual assessment of the site and conditions. Shoreplan staff will carry out a topographic and bathymetric survey along and offshore of the park shoreline. This information combined with your mapping will be used to create a base plan for our design work.
2. We will carry out a coastal analysis to determine the design wave conditions at the site.
3. We will prepare up to three conceptual design alternatives for shoreline protection improvements. The park land is low lying and is vulnerable to flooding. We will develop concepts that utilize the existing shore protection as much as possible while improving protection against erosion and flooding. The designs will protect the foundation of the existing historical outlets and consider wave uprush and armour stability under design wave conditions. The design will also consider protection of the existing trees and connection to the properties to the east and west of the park. No protection along the north side of the adjacent property will be included in the design. Cost estimates for each concept will be provided.

4. We will meet with the Town to review the concepts and select a preferred alternative.
5. Following the meeting, we will prepare the detailed design of the shoreline protection improvements for the Town's preferred concept .
6. We will complete the detail design drawing(s) and specifications. Specifications for the works will be incorporated into the design drawings. We will submit the design drawing(s) to you for review at about 80% completion, and finalize as per your comments. These drawings will be suitable for submission to the approving agencies.
7. We will prepare a brief letter style report summarizing our design procedure. The report and drawing(s) will be submitted to Ministry of Natural Resources and Forestry (MNR) and Niagara Peninsula Conservation Authority (NPCA) for approval. We will complete a screening under Fisheries Act and, if required, make a submission to the Department of Fisheries and Oceans (DFO) for their review. We have included nominal time for follow up with DFO while they are reviewing the submission. No time is included for further work, should DFO decide that an Authorization is required.

**SHOREPLAN**

The cost of the above described work is estimated to be \$39,000 plus HST. We offer this as a lump sum fee for the described work. A breakdown of the cost is provided on the attached Table 1 for your information. This amount includes professional fees and expenses associated with our work. We will invoice the Town monthly for work completed in the month. We require a written authorization (see page 3) or a purchase order to initiate our work.

Our fees include submission to the regulatory agencies and limited follow-up based on our understanding of the project. Additional follow-up will be on an hourly basis at the rates outlined in Table 1. NPCA will require a permit fee. The cost of the permit fee is **not** included in our fees.

Please note that no other analysis is being proposed as part of our work. No fisheries impact, tree inventory, or assessment of natural environment other than coastal processes are included. We can assist with arranging for such services should these be requested by the approving agencies.

The work described in items 1 to 3 can be completed in approximately 8 weeks of receiving written authorization and the Town's base mapping.

Should you find this proposal acceptable, please sign the authorization below and mail back to our office.

Yours truly  
Shoreplan Engineering Limited



J. Graham, P. Eng.



**NOTL - Waterfront Parklands Link  
Shore Protection Improvements**

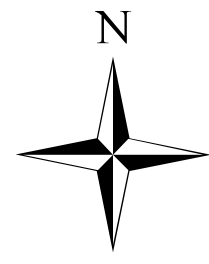


Date: May 17, 2017  
Proposal File: 17-2603

**Table 1**

	Principal	Senior Engineer	Staff Engineer	Senior Technician	Support Staff	Total Fees	Expenses	Total Cost
<b>Staff:</b>								
<b>Hourly Rate:</b>	<b>\$200.00</b>	<b>\$150.00</b>	<b>\$125.00</b>	<b>\$90.00</b>	<b>\$60.00</b>			
<b>Hours:</b>	<b>16.0</b>	<b>84.0</b>	<b>52.0</b>	<b>130.0</b>	<b>30.0</b>			
<b>Cost:</b>	<b>\$3,200</b>	<b>\$12,600</b>	<b>\$6,500</b>	<b>\$11,700</b>	<b>\$1,800</b>	<b>\$35,800</b>	<b>\$3,200</b>	<b>\$39,000</b>
<b>Phase 1: Concept Design</b>								
1 Site Visit and Topographic & Bathymetric Survey	4.0	6.0	0.0	36.0	24.0	\$6,380	\$2,600	\$8,980
2 Coastal Analysis	0.0	40.0	0.0	0.0	0.0	\$6,000	\$200	\$6,200
3 Concept Design	4.0	12.0	4.0	36.0	0.0	\$6,340	\$0	\$6,340
4 Concept Design Meeting	0.0	6.0	0.0	0.0	0.0	\$900	\$300	\$1,200
<b>Phase 2: Detailed Design</b>								
5 Detailed Design	3.0	8.0	16.0	16.0	0.0	\$5,240	\$0	\$5,240
6 Design Drawings and Specifications	3.0	4.0	16.0	40.0	0.0	\$6,800	\$50	\$6,850
7 Design Brief and Approval Submissions	2.0	8.0	16.0	2.0	6.0	\$4,140	\$50	\$4,190
<b>Total Hours :</b>	<b>16.0</b>	<b>84.0</b>	<b>52.0</b>	<b>130.0</b>	<b>30.0</b>			
<b>Total Cost :</b>	<b>\$3,200</b>	<b>\$12,600</b>	<b>\$6,500</b>	<b>\$11,700</b>	<b>\$1,800</b>	<b>\$35,800</b>	<b>\$3,200</b>	<b>\$39,000</b>

**NOTE: HST will be charged in addition to the estimated amount.**



# Dock Area Storm Sewers and Flooding Town of Niagara-on-the-Lake



Author: Jordan Pietroniro  
Department: Engineering  
Date: May 23, 2017  
Projection: NAD 1983 UTM Zone 17N  
Data Source: Town of Niagara-on-the-Lake  
X:\GIS Students\Jordan

- Outlet
- Pump
- Regional Pumping Station
- Storm Manholes
- Catchbasins
- Storm Sewers
- Meter Bag Protection
- Stone Enforcement
- Street Flooding
- Flooding

