



Wignell Municipal Drain Report
For The City of Port Colborne

February 9, 2024

Project No: EWB-189999

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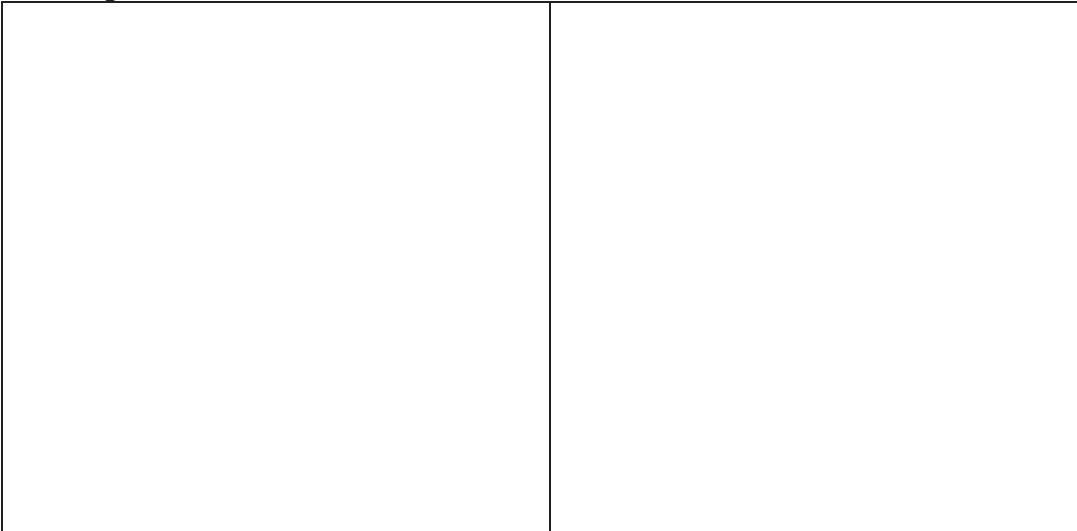
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1 Executive Summary

On July 23, 2018, the City of Port Colborne approved the appointment of a Drainage Engineer, Paul Marsh, P.Eng. from EWA Engineering Inc. (EWA) in accordance with the Drainage Act, Chapter D.17 of the Revised Statutes of Ontario, Section 4 & 78 to prepare an Engineer's Report for the Wignell Drain, Michener Drain and the Port Colborne Drain within the City of Port Colborne (2018-18-02).

The need for improvements to the Wignell Drain was initially recognized in 2003 by way of the appointment of Wiebe Engineering Group Inc. The City of Port Colborne has rescinded the By-Laws for appointing Wiebe. Wiebe Engineering Group Inc. ceased operations and was replaced by Paul Smeltzer of Amec Foster Wheeler as the Drainage Engineer of Record. Amec Foster Wheeler ceased providing drainage engineering services in 2018 after commencing work on the project in 2013.

The Wignell Drain report is the third of three Municipal Drain Reports prepared by EWA within the Wignell watershed. The Port Colborne Council accepted the Michener Drain report on October 26, 2020, and the Port Colborne Council accepted the Port Colborne Drain report on July 26, 2021.

This Municipal Drain Report comprises three reports: the Baseline Report, the Hydrology and Hydraulic Report and the Engineer's Drain Report. The Baseline Report provided the results of an investigation and a review of the existing Wignell Drain and identified specific deficiencies to be addressed in the Report. The Hydrology and Hydraulic Report is an analysis of the three drains assessed using a computer-based model, and the analysis identified peak design flows that are the basis of the design. The Engineer's Report, presented here, provides a design solution, quantifies the works and assesses the drainage works' cost per the Drainage Act.

A summary of the works proposed for the Wignell Drain is as follows.

1. Drain Re-alignment:

Realignment of the existing drain, from STA 5+975 to Carl Rd and Second Concession Rd, which will be impacted by proposed quarry expansion. Changes include;

- a. New 920m of trapezoidal channel Quarry lands to Second Concession Rd and on the south side of Second Concession Rd to existing culverts at Carl Rd and Second Concession Rd intersection.
- b. Culvert replacement for driveway access at 1645 Second Concession Rd.
- c. Inspect and clean, where required, the existing CSPA culverts at Carl Rd and Second Concession Rd.

2. Outlet Capacity Improvement:

Trees and some branches from storm damage obstruct the channel to the lake's edge. An ongoing program of cleaning and clearing vegetation while keeping the basic structure stabilizing the existing banks is proposed. The capacity improvement is a Section 74 / Section 78 Maintenance and Improvement work, including essential maintenance of the gate structure to meet requirements to stop seiche impacts from the Lake while maximizing the gravity flow of the Drain to the lake.

3. Wignell Gate Structure Improvements include the following items;

- a. Replacement of existing motors with actuators for automatic and remote operation.
 - b. Extending the gates to seal to the bottom of the drain, including adding a concrete sill with a keyway for Gates 1 & 2.
 - c. Remove old steel pump mounts and pipes and replace existing safety railings with a new platform and access ramp.
 - d. Improve the trailer-mounted pump ramp and existing pipe connection with a camlock connection.
4. Bank Restoration and Improvement Program (BRIP): Improve the existing south bank along the Wignell Drain between 0+020 and 0+380 based on the landowner's request.
 5. A proposal to consider a nature-based restoration of the Wignell Bog is identified but not incorporated into the proposed works. Restoration of the Wignell Bog was considered during the preparation of this report but was deemed to be outside the scope of the proposed works. Details for the proposed restoration are included for future consideration affecting former agricultural lands.
 6. Remove obstructing vegetation and clearing to grade line – 2+450 to 5+987 as part of drain maintenance Section 74 to EWA Grade Line.
 7. Abandon the original alignment west from STA 5+975 along the former Carl Rd Right of Way (ROW) to the intersection of Carl Rd and Second Concession Rd.
 8. Bower Drain as an existing drain is to receive maintenance - Section 74.
 9. Road Authority Petition for a sufficient outlet to create Wignell Branch Drain #2.
 10. Road Authority Petition for a sufficient outlet to create Wignell Branch Drain #3.

The following are works constructed and included in the cost of this report for assessment of the watershed.

1. Erosion Control Works completed in 2007 – 0+438 to 0+595: construction of concrete block wall along the south bank of Wignell Drain.
2. Construction of an access lane from the existing private entrance at 891 Lakeshore Rd E to the Lake Erie shoreline for Wignell Drain outlet maintenance.

The Wignell drain serves an area of 1,093 hectares based on the defined drain boundary (Figure 1). The main branch of the drain is 6,922m in length from the drain origin, which is defined as the gate on the control structure south of Lakeshore Rd East. The distance from the gate to the outlet into Lake Erie is an additional 289m for a total drain length of 7,211m.

The following are the estimated total costs, allowances, construction, engineering, bridges and culverts, interest charges and other costs to assist staff in completing the project.

There are three Petition 4 requests by the Road Authority for sufficient outlet:

	Estimated Total Cost
• Bower Branch Drain	\$3,318.84
• Wignell Branch Drain #2	\$7,028.45
• Wignell Branch Drain #3	\$20,741.16

The proposed Wignell Drain work is composed of the following costs:

Estimated Cost of Construction:	\$966,934.98
Previous Works Completed:	\$244,423.06
Administration Costs (including Engineering)	\$413,020.28
Wignell Drain Allowances	\$17,899.84
Total Cost of Wignell Drain:	\$1,642,278.16

These costs are assessed to the landowners within the Watershed according to the principles of the Drainage Act of Ontario.

2 Introduction

The need for improvements to the Wignell drain was initially recognized in 2003. At that time, Wiebe Engineering Group Inc. was appointed to prepare a report. Wiebe ceased operations and was replaced by Paul Smeltzer of Amec Foster Wheeler as the Drainage Engineer on Record. Amec Foster Wheeler ceased providing drainage engineering services in 2018

At the July 23, 2018, Regular Meeting of Council, the following resolution was presented in Report 2018-103, appointing Paul Marsh, P.Eng of EWA Engineers Inc., to prepare a Drainage Report:

“That Paul Marsh P. Eng. Of EWA Engineers Inc., be appointed under Section 8 Chapter D .17 of the Drainage Act R. S. 0. 1990 for the new works contemplated and any additional petitions under Section 4, related to the Wignell, Michener, and Port Colborne, that may come forward during the Drainage Act process;”

In addition to the Wignell Drain Report presented here, two other Drain Reports have been prepared and previously adopted by the Council. Both of these Municipal Drains have the Wignell Drain as their outlet:

- Michener Drain outlets to Wignell at 0+010 north of the Lakeshore East Rd and proceeds northerly for 1.7km, ending south of the Friendship Trail. Adopted by Council on October 26, 2020.
- Port Colborne Drain outlets to the Wignell at 2+062 south of the Friendship Trail and proceeds north for 3.3km, ending at or near Second Concession Rd and Babion Rd intersection. Adopted by Council on July 26, 2021.

The Port Colborne Drain originally may have had an outlet to Lake Erie but was diverted to the Wignell in the distant past. For some number of years, the remaining portion, north of the former Canadian National Railway (CNR), now Friendship Trail, has been referred to as a branch of the Wignell Drain. Through an Engineer's Report, the Port Colborne Drain and the Michener Drain have separate assessment schedules.

Figure 1 presents the proposed drain names and catchments for the three distinct Drainage Reports prepared by EWA.

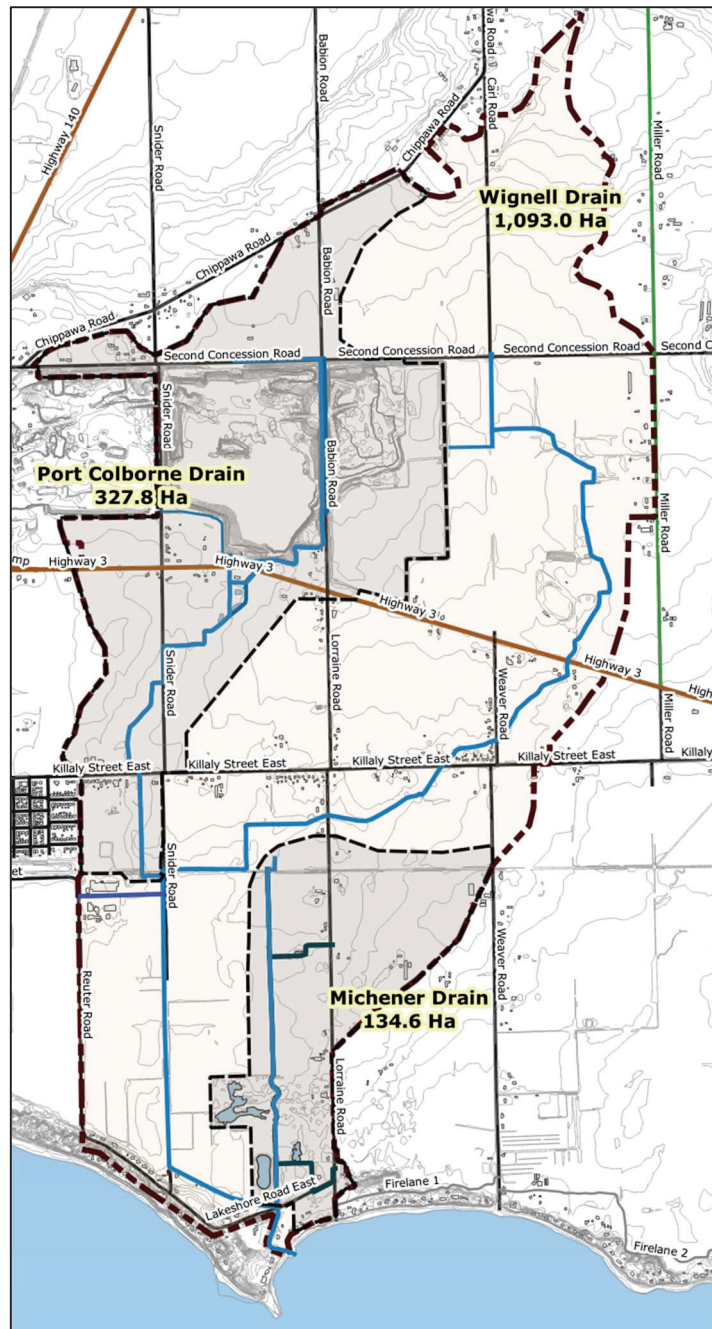


Figure 1 Existing Wignell Watershed; Michener, Port Colborne and Wignell Drains

This report includes a description of all work, associated plans, cost estimates, and assessment schedules for the proposed work on the existing Wignell Drain and for the proposed Branch Drains. The report has been prepared in accordance with the requirements of the Drainage Act, Chapter D.17 of the Revised Statutes of Ontario, Sections 4 and 78.

The proposed improvement work for the Wignell Drain is prepared as a Section 74 and 78 of the Drainage Act. The works are described as maintenance with the exception of re-alignments, which required a Section 78 and Section 4, a petition for sufficient outlet of the Drainage Act. The Bower Drain Branch is a Section 74/78 drain maintenance and improvement by the Drainage Engineer. The Wignell Branch #2 and Wignell Branch #3 are prepared as a Section 4 petition Municipal Drain by Road Authority.

2.1 Objective

The Wignell drain already exists and has for many years. The objective is to maintain the existing drain in a State of Good Repair (SOGR). Changes in land use practices have impacted the drain, primarily a shift from farming garden plots to row crops and quarry expansion, that affects the drain's function. The drain has been impacted by the growth of vegetation within the banks of the drain. This report addresses the growth through cleaning and clearing and provides a re-alignment of the very top of the drain in recognition of future quarry expansion.

The Wignell Drain Engineer's Report is composed of multiple reports:

- **Baseline Drainage Report:** assesses current drainage problems and identifies the extent of the drainage area to be serviced by the municipal drain. The Baseline Report includes a history of drainage and presents historical information such as grade lines.
- **Wignell Watershed Assessment Report:** assesses existing capacity through hydrologic and hydraulic modelling, which identifies the options for resolving problems and recommends a preferred alternative to improve drainage.
- **The Engineer's Drain Report:** provides design documents, final drainage cost estimates and assessment schedules to distribute the proposed work estimated costs to landowners in the watershed.

Previously completed work is included in this report. In 2007, a block wall was constructed to prevent erosion, and other works will be assessed as part of the cost of the works.

2.2 Drain History and Past Reports

Portions of the Wignell Drain remain in this report as they have always been known; however, through the adoption of this report, portions of the drain are being recognized as other names. The section, which was previously known as Michener 2 from its origin just north of the Friendship Trail, will now be considered the Wignell Drain. The portion of what was known as the Wignell Drain from its origin just north of the Friendship Trail has been renamed the Port Colborne Drain. This change was made for three reasons:

1. Historical records indicated that there was a Port Colborne drain that initially had an outlet to Lake Erie but was connected using a re-alignment to the Wignell drain for a better outlet or because the original outlet was compromised.
2. The existing drain names are misleading and confusing with various names, Michener, Michener 2, Wignell 1, 1a, 2, 2a and 2b. For simplicity, the overall watershed will be recognized as the Wignell Drain with two sub-watersheds, the Port Colborne and the Michener.
3. Since the outlet for this watershed is and always has been known as the Wignell drain, the intention through this report is to make the Wignell drain the longest stretch of drain, thus the renaming of Michener 2 branch to become the north extension of the Wignell drain.

The following figure shows Constructed Drains as presented in the OMAF AgMaps application.

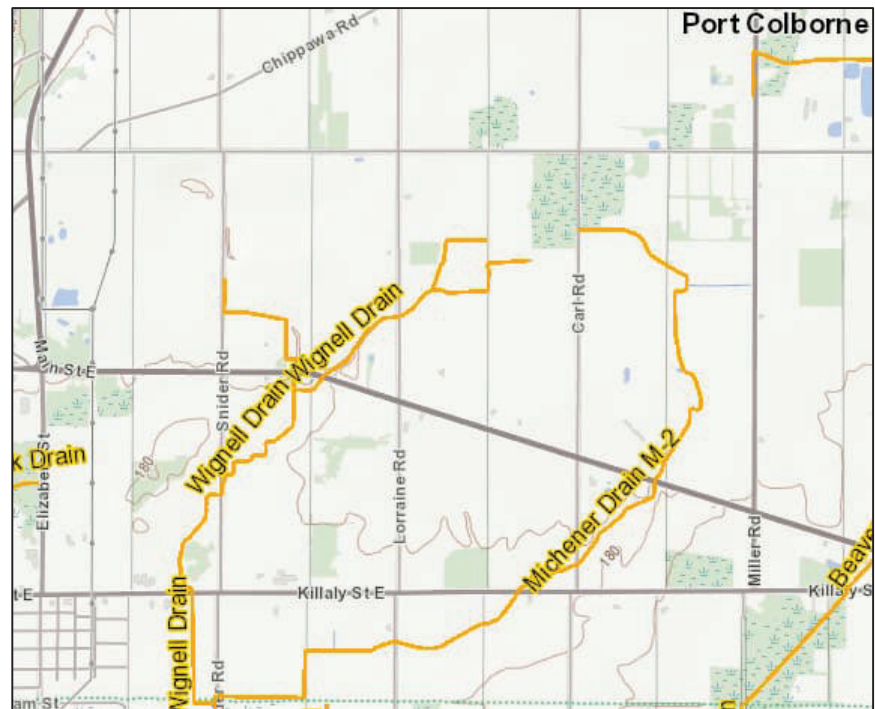


Figure 2 OMAF AgMaps - Constructed Drains

The drain labelled Wignell in Figure 2 has been renamed the Port Colborne Drain by the previously adopted report, and the drain labelled Michener M-2 is the Wignell Drain of this report.

In 1876, the “Atlas of Lincoln & Welland County” identified the Township of Humberstone as having two north-to-south flowing streams entering Lorraine Bay. The stream is shown to originate south of Second Concession Road. A topographic map dated 1904 showed the southern portion of the Wignell Drain with an outlet into Lorraine Bay at its present-day location.

North of the Friendship Trail, the Drain was last improved by an Engineer’s report from D. Ingram of R. V. Anderson, dated July 28, 1978. The lower reach, south of the Friendship Trail, was maintained in 1985, based on the June 21, 1969, C. J. Clarke Engineer’s report, and with periodic spot maintenance works after that.

A report on the Wignell Drain Low Lift Pumping Station was presented to the council and was constructed in the same year. The Report was by CJ Clarke in 1973, By-Law No. 255/73, with the pump supplied by SASS at 10,000 USGPM (631 cms) for a total cost of \$18,240 assessing the cost to five properties (owners; Groetlaars, Braakman and Overholt).

In 1978, according to the Engineer’s Report by R.V. Anderson and Associates Limited (By-Law, No.773/89/78), the Drain was subdivided into five parts, M-1 and M-2 of the Michener Drain and W-1, W-2 and W-2A of the Wignell Drain as the present condition of the Wignell / Michener Drain. The report recommended performing repairs to the pump at the outlet of the Drain, brushing throughout the Drain and removing silt.

Previous information and data regarding the drain were provided to EWA Engineering for review. This information was compiled first by Wiebe Engineering Group (2003) and then by Amec Foster Wheeler (2014).

A 157m concrete retaining wall was constructed in 2007 to prevent bank erosion along the south bank from STA 0+438 to 0+595 by way of a resident's request.

2.3 Wignell Drain Watershed

The Wignell Drain watershed is composed of the main drain (Wignell Drain) and two sub watershed drains, the Port Colborne Drain and the Michener Drain (Figure 3):

- The Wignell Drain is 6,922m of open channel drain with significant vegetation growth.
- The Port Colborne Drain: 3,400m of open channel drain, upper portion previously captured by quarry operations was rerouted along the east side of Babion Rd.
- Michener Drain: 1,800m open channel with the lower portion being predominately golf course operations.

The Wignell drain serves an area of 1,093 hectares based on the defined drain boundary (Figure 3). The main branch of the drain is 6,922m in length from the drain origin, which is defined as the gate on the control structure south of Lakeshore East Rd. The distance from the gate to the outlet at Lake Area is 289m, for a total main drain length of 7,211m.

The northern watershed boundary is south of Chippawa Rd, and the highest point in the Watershed is east of Carl Rd with an approximate elevation of 195m. The drain ends at the intersection of Carl Rd. and Second Concession Rd at the surveyed elevation on the northwest corner of 181.50m. The height of the outlet at the lake varies with the change in sand from storms but is an average of 174.15. The lake level fluctuates and influences the water surface profile in the drain to the lake.

- Watershed average fall (slope) is given as 0.25% or 2.52m per 1000m
- Drain average fall (slope) is given as 0.11% or 1.1m per 1000m

This slope characterizes the Wignell as a low slope or slow watershed. The Wignell Drain from south of the Friendship Trail to the crossing at Lakeshore Rd E was recorded by a report in 1969 (CJ Clarke) as having zero grade for 2 km at a grade elevation of 174.38. In addition to zero grade, the lower portion of the drain is highly influenced by the lake water elevation with a littoral sand beach influenced outlet.

The Wignell Drain can be segregated into four distinct geographic areas.

- Outlet and Dune environment; this area starts at the outlet and extends to about STA 0-289 to 0+600. The drain follows what may have been an original watercourse running parallel to the lake until it crosses the dune area to the outlet at the lake. (Figure 3). The outlet to the lake is perpetually changing, with beach material moving across the drain outlet through wave action, referred to as littoral drift. This area has a shallow slope and features permanent water levels. The outlet will always require maintenance in the form of mechanical sediment/debris removal by equipment. While there are techniques to create a permanent outlet not affected by littoral drift, they are expensive and invasive to the lake environment. The outlet itself is a natural feature and would typically move position as the dunes move and change shape; however, with the outlet on private property, the outlet channel must be maintained and requires mechanical removal to ensure the channel remains open.
- No Slope Segment: From STA 0+600 to 2+400 (adjacent to Friendship Trail crossing); this area is recognised as a very low slope and leaves the dune influenced area with a traditional open channel with defined cross-sectional area. The CJ Clarke report of 1969 created a zero slope drain bottom at 174.38m. The drain in this area has standing water and is flow controlled by hydraulic grade line rather than the ditch grade line. The water doesn't flow out of the drain unless water enters the drain at the Friendship Trail to produce a positive hydraulic energy slope.
- Main Drain Segment: From STA 2+400 to 5+750 is the main branch drain through a predominately farm area with rural residential properties and concession roads. MTO Highway #3 is a crossing road, and Miller is a Regional Road.
- Uplands: From STA 5+750 to 6+922 main branch ends; this is the upper reach or source of the drain's runoff area. This area features very low slopes and a low-capacity channel with 100-year flood lines that extend beyond the drain limits by a significant distance. This is the area to be re-aligned for future quarry expansion.

3 Design Considerations

The analysis of the Wignell watershed is based on hydrologic and hydraulic analysis to predict runoff flow requirements from the existing channel capacity. Water monitoring using sensors for flow or depth has not been practiced in the past. Thus, calibration or validation of the computer-based model results is limited to historical, anecdotal comparisons.

3.1 Watershed Characterization and Use

The Wignell Drain watershed is characterized through land use as a design consideration in the following ways:

1. The overall predominant land use is Agriculture with mainly row crops; soya, corn or cereal grains grown. Former market garden lands in the Wignell Bog lands south of the Friendship Trail are no longer actively farmed for market garden products. The design service level for agricultural land is flooding with low velocities and drainage of ponding areas over 48 to 72 hours. Drainage is provided to improve working time and the overall goal of no crop drowning.
2. Fringe or rural residential is the other significant land use featuring estate lots with houses, buildings, wells and septic beds. Urban expectations of no ponding on residential lots in rural areas can't be met without extensive costs. Acceptable flooding without damage to property contents is a reasonable design service level similar to agricultural land service levels.
3. The Port Colborne Quarries property (PCQ) is expected to expand to the east, and a future envelope has been determined based on property ownership. The actual timing for this is unknown and is dependent on many factors. However, the future quarry will impact the upper portion of the Wignell Drain at some point based on the PCQ submissions.
The expected impact of the quarry expansion will remove a section of the drain and cut off the upper reaches of the drain from having an outlet. This report's proposed realignment at the upper end of the Drain will avoid drain capture from quarry expansion.
4. Wignell Bog lands are south of the Friendship Trail and are defined by the area east of Reuter Rd, West of the Michener Drain and north of the dune lands bordering the shoreline of Lake Erie, North of Lakeshore Rd E.
Design consideration for the bog is driven by the absence of slope or grade to the outlet. The drain channel through the bog relies on incoming flow to drive a hydraulic grade line to the outlet through the Lakeshore Rd E crossing and Gate Structure (Wignell GS). Some acceptance of flooding within the bog is expected, and the service level design target is related to the duration of flooding. The absence of working farms in the bog alters the design expectation and permits the bog lands to be used for natural flood retention.
5. Wignell Outlet is a channel through the dunes to Lake Erie and with the Gate Control structure immediately south of Lakeshore Rd E. The original gates were designed to control Lake Erie influenced flooding to the drain by closing the gates to stop the flow from the Lake back into the Drain. When market garden crops were grown in the Wignell bog, a pumping station was built in 1973. Pumping included inline submersible pumps and low-lift centrifugal pumps, but

pumping ceased operation in 2014 with the removal of the low-lift pump for repairs.

Lake Erie Levels

In geologic time, Lake Erie levels have varied depending on glaciation and the various flow sills that have existed in and out of the Great Lakes basin. These sills have changed in elevation as landforms rebounded from the effects of glaciation. In the modern period, Lake Erie levels are dominated by flows entering from Lake Huron and exiting out of Lake Erie into the Niagara River and Welland Canal system.

Historic lake levels (Figure 4) are provided by the Government of Canada Fisheries & Oceans Hydrographic Service based on 100+ years of monitoring data and statistics. The values are quoted in monthly mean water levels reference to IGLD 1985.

Yearly Average	Minimum Monthly	Maximum Monthly
174.17	173.18	175.14

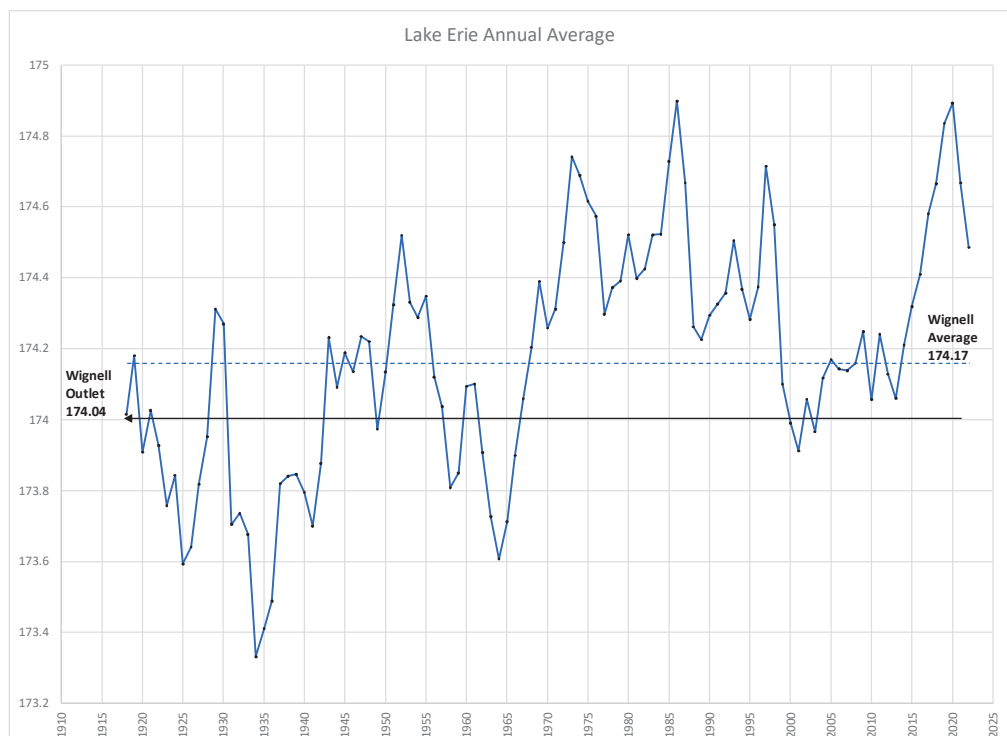


Figure 4 Lake Erie monthly mean water levels, m to IGLD 1985

The chart shows that water levels have been above average for the past few years.

Lorraine Bay

Lake Erie water quality effects and the potential cause (or causes) are too large and significant of a topic to be covered in this report. Lake Erie phosphorous levels, Algae blooms, and hypoxic zones within the Lake are well documented, but these are more significant lake scale effects than the observed localized effects within Lorraine Bay; however, a relationship between all aspects of the Lake can't be excluded nor is it reasonable to focus on the Municipal drains as a sole contributor to water quality concerns.

The Tribunal heard an appeal from Mr. Bill Walker, appellant, on April 3, 1997, and the decision was reached on April 11, 1997. Text is available at Canlii. The decision was based on Section 83, which was later repealed in 2010, which prohibited pollution within a drain. The Ministry felt that other legislation provided more effective tools for dealing with pollution than the Drainage Act provides as regulation. The appeal brought by Mr. Walker was dismissed, and the costs of the Tribunal (Engineering time) were assigned to the appellant.

It is reasonable to expect that the municipal drain would be designed to enhance drainage and water quality or mitigate the potential adverse effects of runoff through design. Contributory to these concerns would be changes in land use in upstream areas along with changes such as Climate Change that affect both precipitation events and heating impacts between precipitation events.

The forecast for climate change to decrease ice coverage in Lake Erie increases the events that impact the Drain through seiche event flooding controlled by the existing Wignell GS. In previous years, when the lake was covered in ice, there was less risk of lake-induced flood events because the ice moderated the seiche events. With less ice coverage in the future, the expectation is for more wintertime seiche impacts.

3.2 Wignell Drain Bank Stability

Bank stability has been an issue for the Wignell Drain for some time. The drain passes through what was originally the Wignell Bog, a low area with mostly peat soils. Peat soils are susceptible to erosion when they dry out and have a significant runoff event with higher velocity flows. It's essential to recognize that with a 0% grade channel, high-velocity flows are relative.

Typical bank stability methods used by the City have featured two techniques:

- Gabion baskets, and
- Pre-cast concrete blocks.

Gabion baskets and pre-cast concrete blocks are recognized today as a 'hard' engineering approach to bank stabilization techniques. In recent years, technical resources for using bio-engineered materials to create stable banks have gained acceptance and recognition as a viable response to bank erosion. The techniques for bio-engineered bank stabilization feature plant and organic materials integrated to develop a fibre and/or root zone that holds soil and resists erosion. In many cases, bio-engineered bank stabilization is implemented along with channel modifications to reduce bank-side traction velocities.

Pre-cast Concrete Blocks were used on the south bank of the Wignell drain for 157m by petition for works by a local landowner in 2002. This work required significant geotechnical effort to support the heavy pre-cast concrete block on peat soils. The tendency for the pre-cast blocks to differentially settle, shift and tip towards the channel is evident in areas around Port Colborne.

3.2.1 Wignell Bank Protection 2006/2007

Previous to this report, a request to resolve bank erosion was made by a property owner adjacent to the Drain. The Drainage Superintendent then investigated and prepared a

The Wiebe Engineering Group Ltd. fees include the total engineering cost of the Wignell 2006 Erosion Works and the geotechnical report cost of \$32,098.76. Additional to this engineering fee is the cost of financing achieved through a debenture in the amount of \$17,209.32 for a total project cost of \$290,562.54.

This approach protects the bank from further erosion for \$2,121 per m. This cost is shared between the adjacent landowners, who benefitted from the works by protecting their land, and the upstream landowners as an outlet liability from runoff. This is apportioned between each by the ratio of total area to upstream area from a point where the protection commenced to a point when the protection ended. In this case, 86% of the costs are assessed to the upstream landowners, and 14% of the costs are assessed to the riparian landowners, of which there are three. Those three riparian landowners are:

271104000403720 – 130.6m

271104000403800 – 130.6

Snider Rd Allowance City of Port Colborne – 26.4m

Inspections completed in 2022 identified that some of the concrete blocks show evidence of spalling and cracking and will require replacement as part of maintenance work. Maintenance work to maintain the concrete block wall will be assessed to the watershed as a maintenance cost.

3.2.2 Bank Restoration and Improvement Program (BRIP)

The following sections describe the types of bio-engineered solutions proposed for implementation on the Wignell Drain.

3.2.2.1 BRIP Goal

Introduce a green infrastructure alternative to traditional hard surface engineering solutions using bio-engineered materials and techniques for bank restoration and erosion control methods applied to select portions of the Wignell Drain.

3.2.2.2 Design Elements:

The following are design elements or techniques to be used in concert to create a complete program of bank erosion control.

Riparian Seed Mix

A seed mix will be planted adjacent to the drain and is provided as a complement to the already specified spoil bank seed mix detailed on the drawings. The components of a riparian seed mix are:

- Fowl Manna Grass – *Glyceria striata* – 2%,
- Fowl Bluegrass – *Poa palustris* – 30%,
- Fox Sedge – *Carex vulpinoidea* – 30%,
- Path Rush – *Juncus tenuis* – 8%, and
- Virginia Wild Rye *Elymus virginicus* – 30%.

Upland Native Meadow Mix

In addition to the Riparian See mix, other areas can be sown with an upland meadow mix instead of the currently detailed grass mix. The use of the meadow mix is for areas of land that will not be mowed and is mixed as follows:

- Black Eyed Susan – Rudbeckia hirta – 10%,
- Blue Wood (Heart Leaved) – Aster cordifolius – 1%,
- Canada Anemone – Anemone canadensis – 1%,
- Canada Goldenrod – Solidago canadensis – 2%,
- Common Milkweed – Asclepias syriaca – 2%,
- Evening Primrose – Oenothera biennis - 25%,
- Grass Leaved Goldenrod – Euthamia Graminifolia – 1%,
- Meadow/open Field Sedge – Carex granularis – 15%,
- New England Aster – Aster novae-angliae – 1%,
- Riverbank Wild Rye – Elymus Riparius – 40%,
- Virgins Bower – Clematis virginiana – 1%, and
- Wild Bergamot – Monarda fistulosa – 1%.

Vegetated Rock Buttress

This technique is the primary bank stabilization feature, including a mix of embedded rock materials with plantings along the bank slope. Size and bank slope are varied to suit the specific situation. Field adjustments to suit each situation are expected.

This technique replaces the hard edge of the drain channel with a natural boundary consisting of natural elements to maintain bank stability.

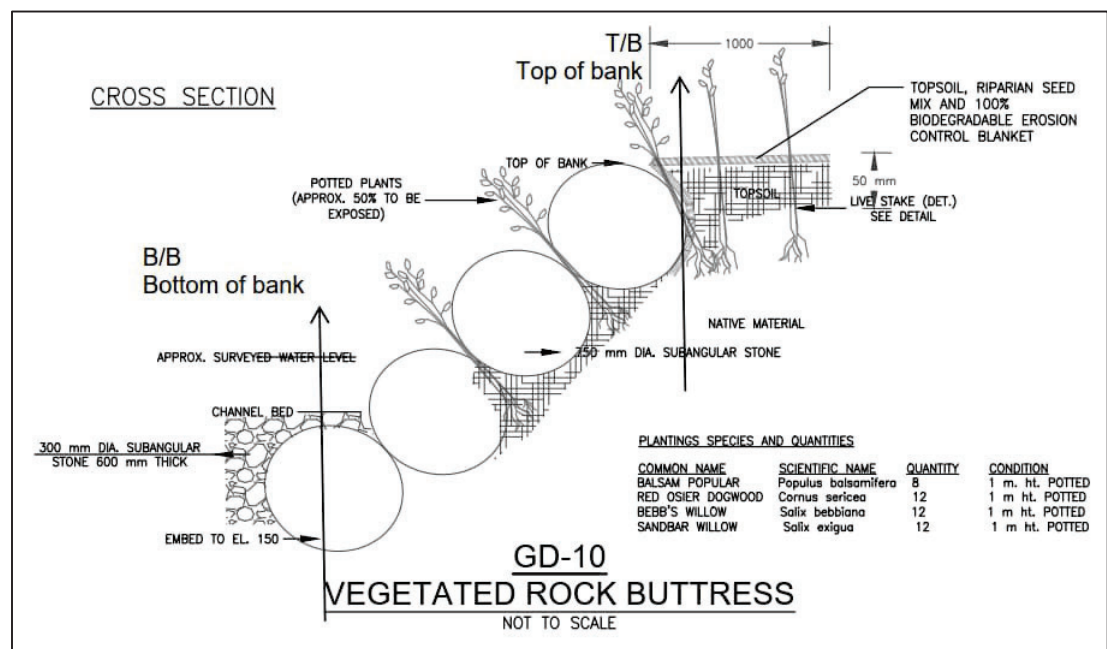


Figure 7 Vegetated Rock Buttress

The vegetated rock buttress is the preferred bank stabilization technique to achieve a soft or bio-engineered solution offered as an alternative to the concrete block retaining wall. An estimate of the construction cost for this type of bank improvement is \$75/m. This cost will depend on the environmental measures required during construction by

NPCA and DFO and restrictions on the working window when in-water work can be performed.

Riprap Reinforced Bank

For some areas, a higher level of protection is required, and for these bank areas, the riprap reinforced bank, shown in Figure 8, is proposed.

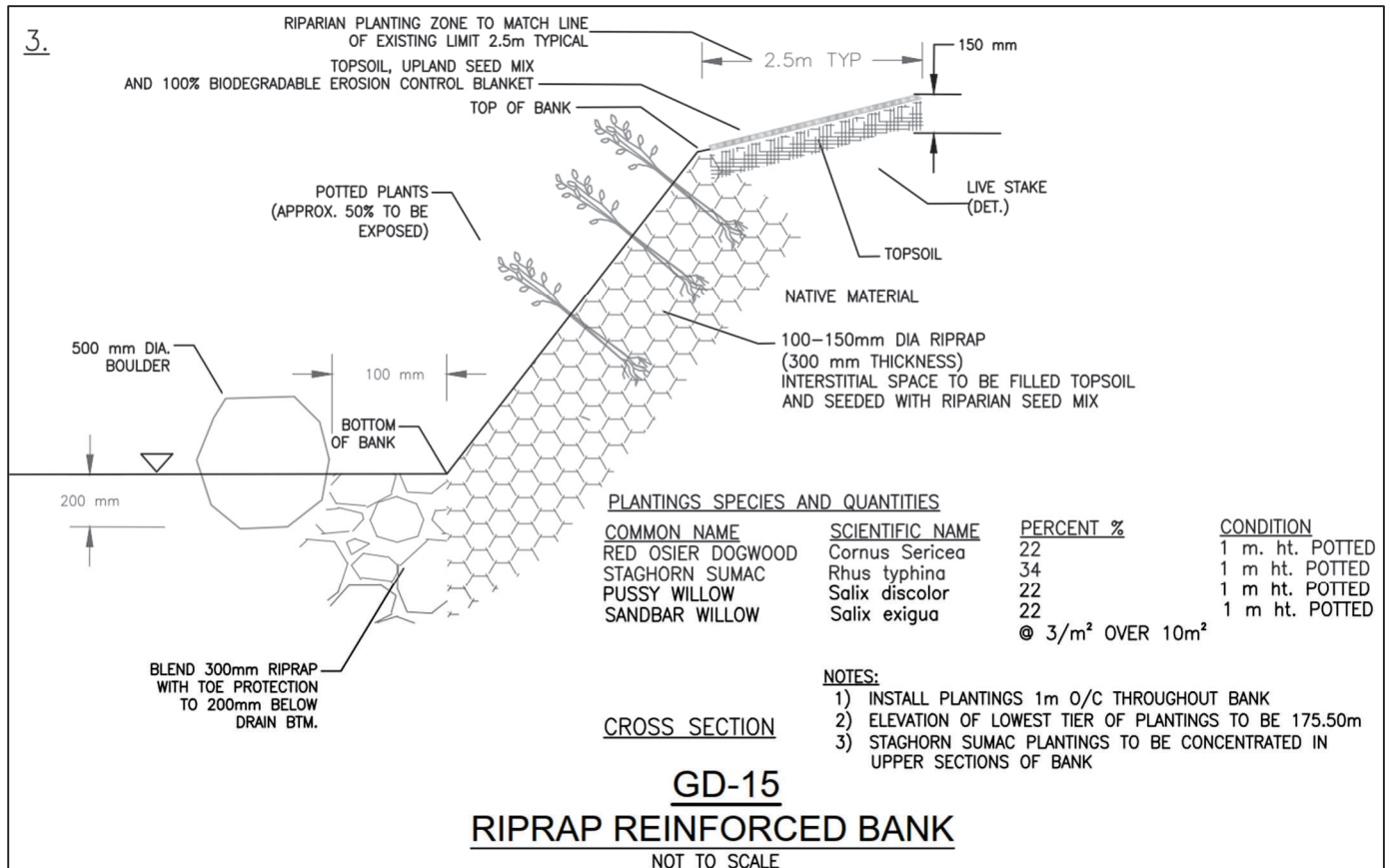


Figure 8 Riprap reinforced bank improvement

This design detail contains a vital aspect at the bottom of the channel: a stabilizing rock anchor (a boulder) placed a specific distance along the bend to reduce the bank edge velocity and create slow spots of water behind the boulders.

The estimated construction cost for this type of bank improvement is \$145 per m, depending on the environmental requirements at the time of construction.

Construction Details

Bank construction requires the bank area to be separated from the channel flow using a bank isolation and dewatering technique, shown in Figure 9.

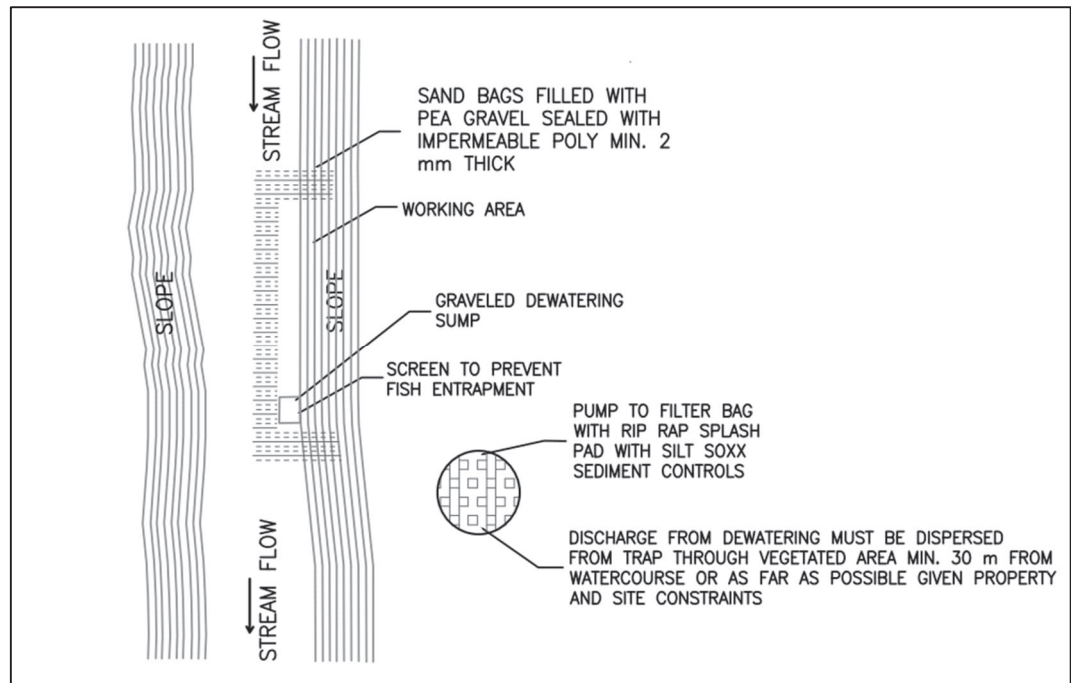


Figure 9 Bank isolation during construction

Temporary structures create a zone for the vegetated rock buttress construction. Once the vegetated rock buttress is constructed, the isolation structures are removed.

This section of the drain has a DFO classification of 'C'; Works on the drain are limited, with no in-water works between March 15 and July 15 every year to protect fish and their habitat.

3.2.3 Riparian verses Watershed Benefit

The Drainage Act contains several key concepts, of which two are directly relevant to the BRIP are:

- Injuring liability, Section 23 (1), and Outlet liability, Section 23 (2).
- Special Benefit Assessment, Section 24.

Where there is no extenuating circumstance to the direct flow of the channel due to a bend, alignment adjustment, tree or other object that obstructs flow and causes a change in velocity, the whole benefit of the BRIP, 100% of the cost is assessed to the adjacent landowner(s) as a Special Benefit. This approach recognizes the benefit of using existing natural channel soils and plants without modification as the preferred method for a drainage channel.

Where there is an extenuating circumstance to the flow of the channel, as described above, the cost of the BRIP is split with a portion allocated to the upstream watershed and a portion assigned to the benefiting adjacent landowner(s) as a Special Benefit. The ratio of an upstream area determines the portion compared as a percentage of the entire watershed area. This is a similar cost assessment approach to that recommended for culverts as described in Drainage Guide for Engineers, Pub 852.

The need for a Bank Improvement is confirmed through a three-step process:

1. The riparian landowner submits a request to the Drainage Superintendent that identifies an existing bank erosion problem.
2. The Drainage Superintendent and/or Drainage Engineer will attend the site and perform an inspection of the bank. The need for a BRIP response and the recommended type of response is at the sole discretion of the Engineer or Superintendent as the technical responsible authority identified by the Drainage Act.
3. The proposed solution and associated estimate of costs are presented to the landowner who made the request, and acceptance is confirmed prior to the commencement of work.

It is at the sole choice of the Engineer/Superintendent to select the appropriate measure for the Drain.

3.3 Wignell Bog

The bog poses a drainage design challenge for the watershed. The bog exists as there is little to no grade from the start of the bog South of the Friendship Trail to the outlet to Lake Erie. Bog lands are defined by the peat soil structure created before the drain's existence through persistent standing water since the last glacial period.

The bog land is at risk of erosion through extended drying and recurring flood events with high velocities along the drain banks.

Historic market garden activities ceased on or around 2013 once Vale completed studies that revealed soil contamination made it unsuitable for growing food. Vale has since assumed ownership of the lands. The cessation of market garden activities has altered the land use in this area.



Figure 10 Air photos 1955 and 2020 showing land use changes

Figure 10 images are sourced from Niagara Navigator. The black and white image on the left is from 1955 and shows the extent of farm plots, farms shown in green, within the Wignell and Michener Drain watershed. The farm parcels to the immediate west of the Wignell Drain are of particular note. These parcels of land are no longer farmed, as visible in the photo from 2020, along with other lands that are no longer farmed. There are still lands being farmed within the lower reach of the watershed, shown in green, but more lands within Michener Drain are farmed than within Wignell Drain. This is because the land is higher in the Michener Drain watershed than in the Wignell Drain south of Friendship Trail. A Technical Memo considering the Wignell Bog is included in Appendix D.

3.3.1 Bog Restoration

While restoration of the Wignell Bog was considered during the preparation of this report, it was determined to be outside the scope of the proposed works.

A summary of the conclusions from the Technical Memo (provided in Appendix D) is provided for future consideration.

There is a benefit to the watershed realized by restoring the previous market garden lands to bog lands again. The bog lands would not be achieved in the same manner as was prior to the drain but in a modified form. The original bog lands stored flood waters with a slow release through the sand dunes to the Lake. This led to the formation of the bog in the first place. Restoring a natural land type with a natural water cycle will benefit the entire watershed.

The proposed role for the restored bog in flood zone hydraulics would be acting as a stormwater storage feature. This allows the bog lands to continue to drain naturally through the Wignell Drain outlet at the rate determined by the hydraulic water surface profile based on influent water above Friendship Trail. Allowing the bog to fill with flood waters to a point that does not impact land uses with associated slow release will restore the bog lands to a more natural state over time. This could be aided through specific management measures in conjunction with relevant expertise such as would be available from NPCA, MNR, DFO and other relevant agencies.

It is recommended that the bog lands not be drained down through artificial means past the 174.60m point. During dry periods in the summer between rain events, it is probable that the water surface will drop below this level, depending on the lake elevation. Water taking from the bog below this level should be avoided during the spring/summer/fall period.

Figure 11 Wignell Bog Elevations, was created using NPCA 2012 DEM elevation points available as Open Data. These data points are on a 10m spacing, and each point was given a blue colouration based on the DEM height. Points were ‘captured’ or selected based on being greater than or equal to 174.5 up to 175.5m, the equivalent given or accepted elevation used as the Wignell Drain Top of Bank (TOB).

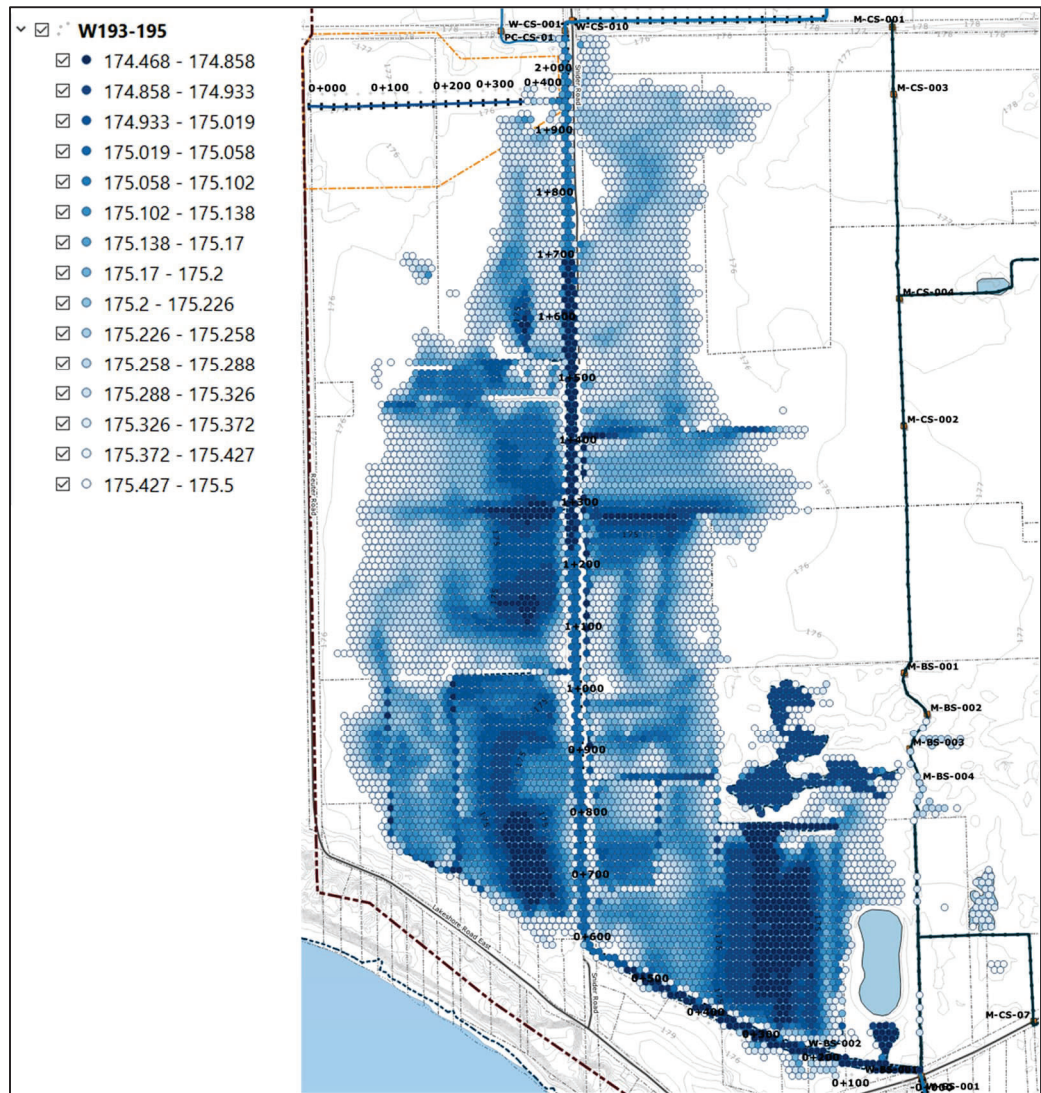


Figure 11 Wignell Bog Elevations

The darker the blue dot, the deeper the land surface is at that point, with the darker shades of blue being only 0.12m above the 1978 CJ Clarke report given grade line drain bottom elevation of 174.38. Any land area without a blue dot is higher than 175.5 (or lower than 174.5).

A separate design plan for the bog restoration should be considered with a new topographic data set collected using new methods for a denser point record than was available from the NPCA data. This new data could be used to assess the additional runoff storage volume available. A new version of the hydrographic model could be implemented to assess runoff flows and storage volumes more accurately.

3.4 Wignell Gate Structure, Outlet and Pumping

The existing gate structure dates from the 1969 CJ Clarke report, including creating 2 km of Wignell Drain at a 0% grade line. There are three pumping platforms at the Lakeshore Rd E crossing that were constructed by report in 1973;

- a portable pump deployment on a ramp, including discharge pipe crossing Lakeshore Rd E,
- instream submersible pumps (2) with discharge piping and,
- a centrifugal pump mount that occupies the western gate opening (Gate #3).

The existing pump wet well with a centrifugal pump was constructed in 1973 and operated by local farm owners.

3.4.1 Existing Gate Structure Deficiencies

The following are items identified as maintenance works (Section 74) to maintain the gates in a State of Good Repair (SOGR).

1. Remove the pipes that obstruct full gate movement.
2. Replacement of all existing handrails with handrails that meet safety code requirements.
3. Reconfiguring the access to the gate by adding stairs on the west side.
4. Restricting public access to the gate structure.

The purpose of the gate structure is to prevent high lake levels during a seiche event from running backwards into the drain. However, it is important to note that the protection from the gate will not prevent all flooding from high lake levels. It is recommended that the gate be kept in a SOGR through a maintenance program.

3.4.2 Wignell State of Pumping

Tender crop farms were historically located in the bog lands, and the farmers whose lands were most affected by flooding within the bog petitioned for and constructed a pumping station.

An analysis of the previous and proposed pumping of the existing gate structure with modifications was undertaken and is attached in Appendix D as a technical memorandum. The technical memorandum concludes that a significantly larger pump, 900mm suction and discharge, would be required to address precipitation runoff when the gate is closed. The previous pump was 631 lps (10000 USGPM) and, as discussed previously, was solely intended to assist with farming the market garden, not to provide flood relief during precipitation events.

Historical information shows evidence of three types of pumping used at the Wignell Gate Structure.

- In-stream submersible pumps using the discharge piping shown and still existing on the gate structure. These pumps clogged regularly, were difficult to keep in service, and were permanently removed from service circa 2010.



- A centrifugal pump located on the gate opening was installed and working through the 1980s. This pump was removed and sent for repair on or about 2013 to SASS in Chatham Kent and has been discarded. SASS ceased manufacturing in 2001 and ceased to exist in 2016.
- A portable pumping arrangement is configured for pumping from the north side of Lakeshore Rd E through a CSP discharge pipe to the south side and into the downstream side of the outlet south of the gate structure.

This is based on historical reviews prepared by Mr. Henri Bennemeer, former Drainage Superintendent.

Starting in 1957 with Casmir Rawski, Cornelius Braakman & J.C. Groetelaars, several petitions were made to construct a flood gate at Lakeshore Bridge on the Wignell/Michener Drain due to the problems associated with flooding of agricultural lands south of CNR. It was concluded that the existing drain be widened from the CNR south to Lake Erie, and flood control gates be installed on the south side of the existing bridge at Lakeshore Road. The next By-Law, No. 255/73, includes the report on the Wignell Drain low lift pumping station, prepared by C. J. Clarke and Associates, dated February 23rd, 1973. This Report recommended the installation of a 9,000 USGPM pump and appurtenances to the south of the Lakeshore Road control gates. A schedule for those works was included in the report, assessing the cost to five properties owned by three landowners.

From a guideline for drainage pumping schemes, a stated range of 6mm to 12mm (1/4 inch to 1/2 inch) of runoff from a watershed over 24 hours is the expected pump capacity. For the Wignell watershed, this would be 0.8 cms to 1.6 cms as the stated service level standard pumping rate.

As mentioned, the original pumping was in place to benefit the upstream market garden areas within the Wignell watershed. Figure 12 shows the lands identified and assessed for the pumping benefit as reported through the Assessment record provided to the Drainage Engineer and included in Appendix C.

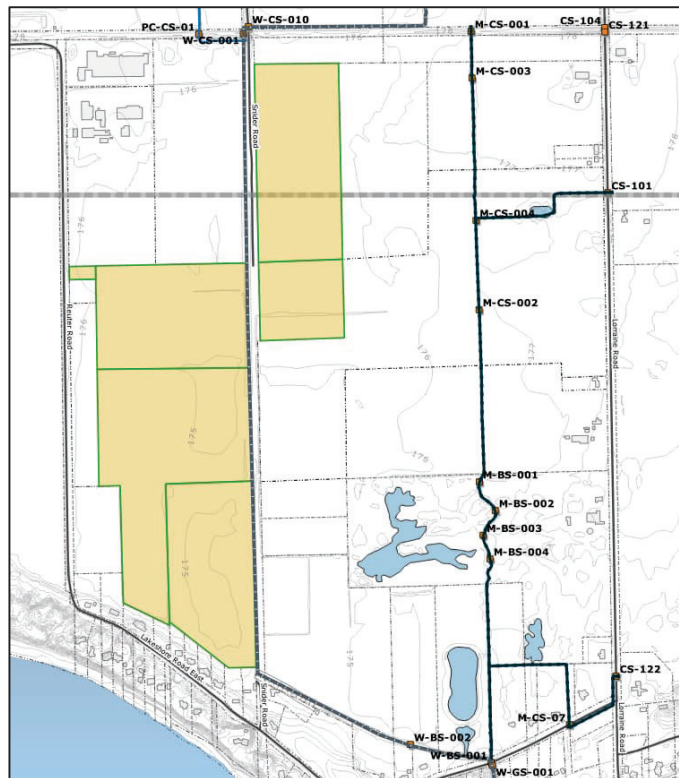


Figure 12 Previously Assessed Lands for Pumping

Five properties were included in the pumping assessment. These farms have ceased operation, and many of these properties are now owned by Vale. Vale owned properties are shown in Figure 13. Vale and City owned land (yellow). The contour lines for elevation equal to 175.0 are the purple dotted lines.

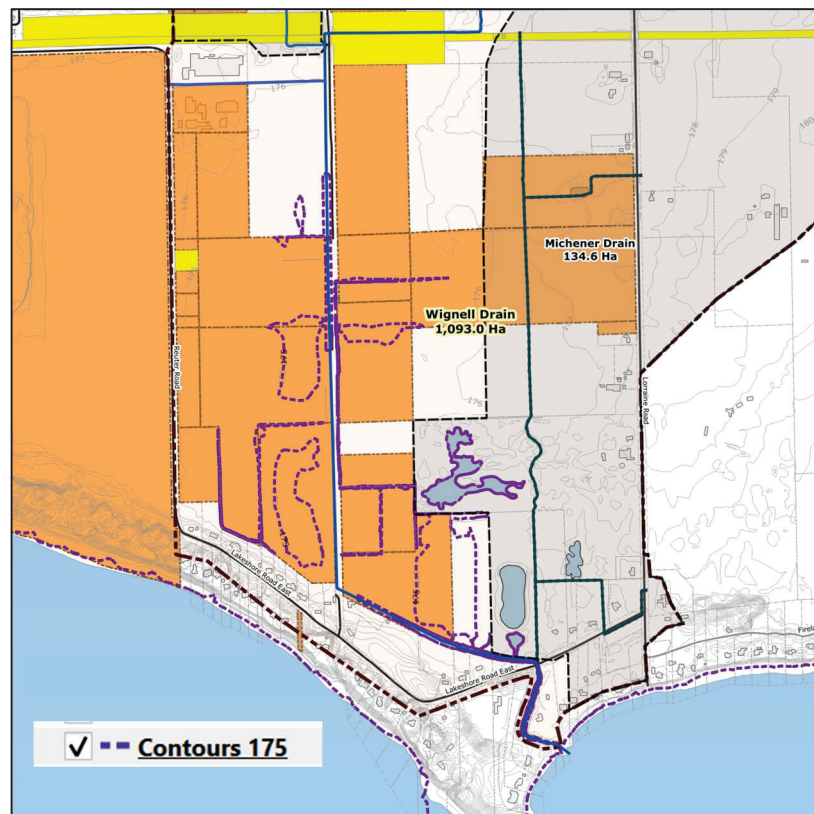


Figure 13 Vale and City owned land

The remaining farms have changed to row crops, which do not demand the same service level from a pumping system. From this perspective, there are two primary paths forward for consideration.

Option A: Replace the original pumping system with a pumping system that meets the stated expected standard with a pumping rate of 0.800 cms to 1.6 cms. A preliminary estimate of \$400,000 to \$800,000 is the approximate cost to return pumping to the existing gate structure.

Option B: Abandon the primary pumping and only use the trailer deployed pumping for the Wignell Drain and effectively use the gate structure to manage seiche conditions and runoff events. Estimates range from \$20,000 to \$280,000 depending on configuration. See cost estimates in Appendix B.

We recommend implementing Option B as the most cost-effective means to control most flooding within the Wignell lower watershed. A technical memo providing a detailed assessment of the existing pumping structure and gate structure is included in Appendix D.

3.4.3 Gate and Outlet Capacity Assessment

An examination of the cross-sectional flow area of the outlet identified that the existing gate structure flow capacity is small relative to the upstream flow areas. Compared to the upstream trapezoidal and downstream trapezoidal channels, there is a 67% reduction in available flow area (from 12.75m² to 4.14m²) (Figure 14).

This is based on a 1.5m depth of flow through the existing channels, based on a survey of the upstream channel at roughly 0+200, indicating a south top of bank elevation of 175.44m (AMEC 2013).

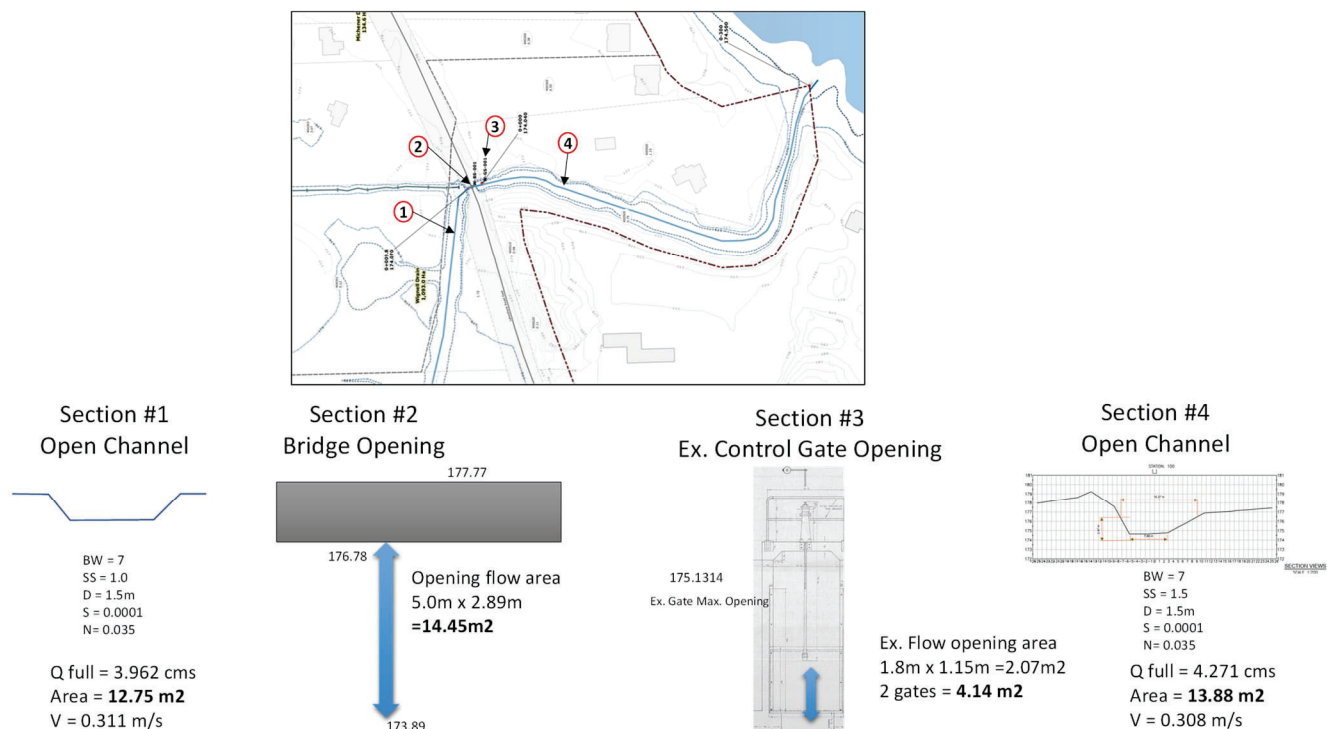


Figure 14 Outlet Structure Flows

This shows that the two trapezoidal sections upstream and downstream provide roughly 13m^2 and 14m^2 of cross-section area for flow conveyance. The existing bridge crossing Lakeshore Rd E provides a flow opening of $5\text{m} \times 2.89\text{m}$ with a corresponding flow area of roughly 15m^2 .

The existing flow area through the gates is too limiting and requires improvement. However, there is a limit to what can be improved based on the existing grade to the lake, the receiving lake water level, and the surrounding height of land.

To improve the flow to the lake, there are three measures to consider:

- a) Increase the cross-sectional area through the gates. This benefits storm runoff that is flowing to the lake.
- b) Increase the slope of the channel to the lake. Unfortunately, this is difficult to achieve because, at present, there are times when the existing outlet is lower than the lake water surface. The flow to the lake is controlled by the top of the water surface north of Lakeshore Rd E, and the top of the water surface at the lake, and existing rock elevations influence the existing bottom of the drain.
- c) Reduce and/or eliminate any flow inhibiting restrictions, such as trees within the flow channel, or other flow obstructions between the Wignell Gate Structure and the lake edge.

The dunes at the edge of the lake create a height of land through which the drain passes, and this area features a deep channel. However, the sides of this channel are much higher in elevation than the sides of the channel north of Lakeshore Rd E. The flow is 'driven' or controlled by the water surface elevation more so than the bank elevation.

3.5 Design

The following describes the design basis for this drain. Descriptions of design criteria are intended to meet the requirements of O. Reg. 588/17: Asset Management Planning for Municipal Infrastructure, specifically Table 3.

3.5.1 Criteria

The following section establishes the level of service for the Wignell Drain. Channel size is confirmed to be based on a 1 in 5 year return period storm, which is expressed as a design storm as follows:

- 5-year cumulative storm with a total rainfall of **68.9 mm** using a Soil Conservation Service (SCS) Type II **24-hr** storm distribution.

The design storm is used to forecast a predicted runoff for identified catchments. Each channel section is designed to convey this runoff.

3.5.2 Drain Capacity Design

The Wignell Watershed Report, provided under separate cover, describes the hydrology and hydraulic modelling used to assess the existing watershed. A revised model was implemented for the design and capacity determination of the existing channels based on the design drawings attached to this report. The hydrologic model is depicted as runoff areas, with links and nodes in Figure 15, implemented in PC-SWMM (stormwater runoff software using Environmental Protection Agency, EPA Stormwater management model v5.2.3)

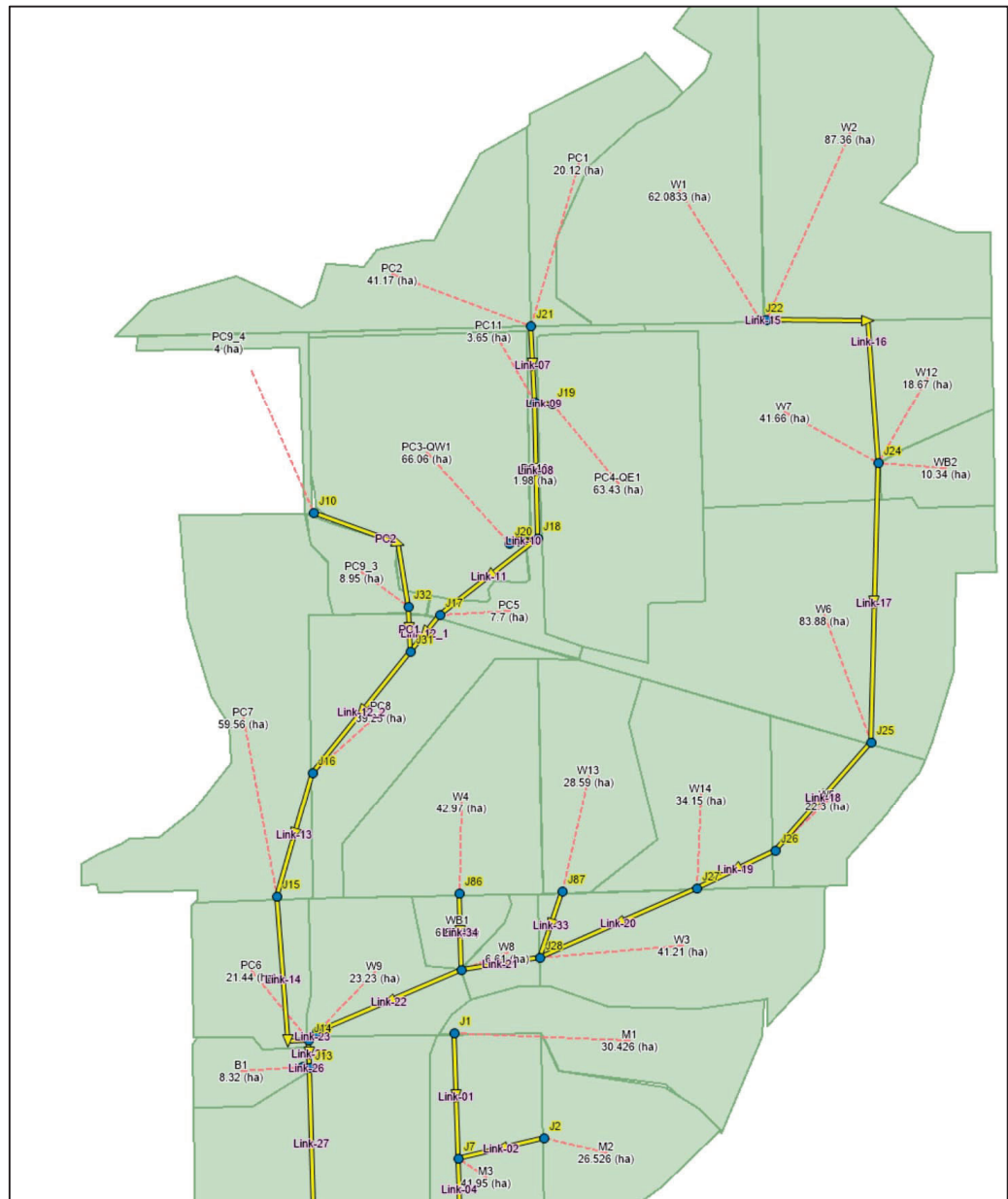


Figure 15: Wignell PC-SWMM Model

The specific results for the Wignell Drain, Port Colborne Drain and Michener Drain are included in the table on Channel Design parameters in Appendix D. The table provides a design ratio based on the comparison between model predicted flows and proposed/existing channel capacities.

4 Drain Works Recommendations

The following sections detail the proposed works for implementation.

4.1 Description of the Works

The following presents a program of proposed improvement works for the Wignell Drain. As a program, some works are staged and may not proceed in a step-by-step manner but on an 'as and when available' basis that best meets environmental and regulatory requirements.

4.1.1 Wignell Drain Flow Improvement

The primary function of the proposed works for the Wignell drain is maintaining the channel section and reducing flow restrictions. This is for two critical restoration efforts as follows:

Restoration works #1 is the removal of vegetation between the top of the bank and the top of the bank. This removal targets tree and shrub growth that limits or could obstruct primary flow paths. Every effort to retain trees and understory growth, not in the channel, will be made to reduce the environmental impacts of the maintenance work. A work zone is required for the channel improvements. A vital aspect of this is the removal of standing dead ash trees. Fallen limbs from these trees create obstructions within the existing flow path.

Restoration works #2 is to remove any deposition humps or deviations that are impeding flow. This does not include any changes to grades that were over deep or past the calculated grade line in the past but does include channel bank stabilization where slips or excessive erosion are evidenced during the restoration works #1. Channel restoration is typically done from one side; however, where the drain is too wide for equipment to reach, the restoration will be completed from both sides of the channel. In areas of one working side, every effort will be made to reduce existing stable bank cover damage on the opposite side of the work zone.

Most of the proposed work for the Wignell Drain is to re-establish the original drain capacity and function by cutting trees and vegetation that have grown in the drain. Figure 16, below, illustrates a typical cross-section view of the work and work zone required to do the work.

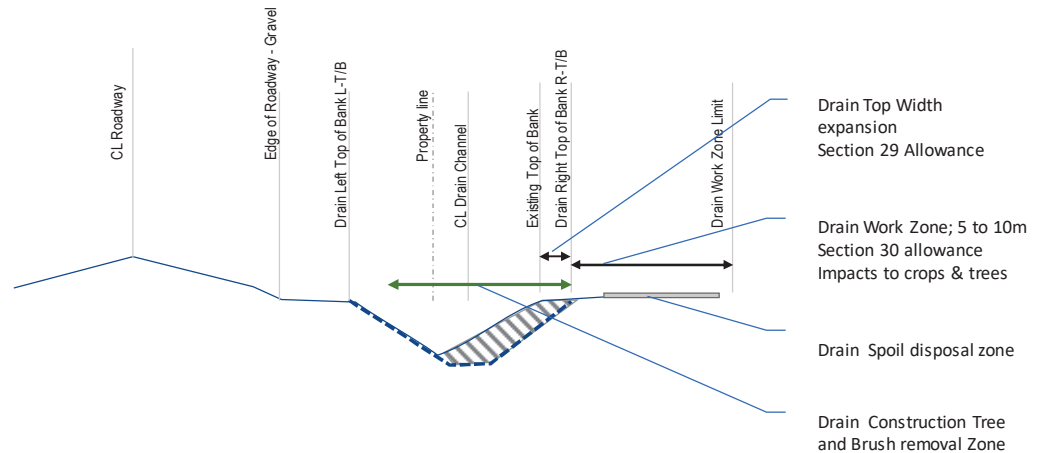


Figure 16 Typical Drain Work and Work Zones

With the main work program, the original drain is cleaned down to the proposed grade line, and a specific capacity is achieved by removing the bottom and one bank. It is beneficial to only disturb one bank and leave low vegetation in place. Trees through the drain top of the bank (T/B) to the top of the bank (T/B) are removed, leaving stump and roots in place if the removal negatively impacts the grade.

Removing trees from the work zone is eligible for the Tree Canopy Preservation program. This program replaces existing trees removed on private property for the drain with saplings to be planted outside of the working corridor of the drain.

4.1.2 Wignell Drain Re-Alignment

Above Station 4+726, north of Highway #3, the Wignell Drain is adjacent to the planned expansion of the quarry. There is no permanent impact to the drain until the change in alignment to the west at station 5+975, which is expected to be impacted by the proposed quarry extraction limit.

This section of the drain has been realigned along the quarry land property line, Roll No. 271104000311200, to the Second Concession Rd, where the proposed Drain turns west and remains on quarry property until at 6+700 at the south side of the Second Concession Rd allowance proceeds west to the existing Drain culvert crossing. This reconnects the former drain channel (culvert) to the realigned drain channel.

The design is a traditional ditch constructed with a new alignment for the northern portion and to keep the existing alignment south of 5+960.

The portion of the drain from 5+020 to 5+330, Roll No. 271104000308300, is proposed for extraction by PCQ. This section is proposed for bypass during extraction, and once extraction is complete, PCQ will restore the original drain channel using a similar but not identical path. The intent is to connect the two ends at the property line crossings with a simple arc. This work is recognized as temporary and thus not detailed in this Drainage Report. PCQ will provide plans, drawings and supporting calculations before the drain channel is impacted.

4.1.3 Wignell Bank Restoration and Improvement Program, (BRIP)

At the time of this report, there is only one section identified for bank restoration, which is the lower reach of the Wignell from station 0+020 to 0+380. The bank restoration is focused on the south side bank from 0+100 to 0+200, specifically on the property identified as Roll No. 400900.

The BRIP is established within this report as a maintenance activity under Section 74 to execute work that benefits the local landowner for whom the bank exists on their property and the entire watershed. The work is to re-establish an eroded bank, which has moved back away from the original position through erosion or changes in alignment due to erosion. The maintenance program will be available within the Wignell Drain based on the Drainage Superintendent performing an inspection, assessing and confirming that an eroded bank exists before the work commences.

The work consists of bio-engineering to stabilize and/or restore the bank of the drain to the original position in response to erosion of the bank. This work is detailed and shown in Drawing W.GD-02 of the drawing set (Appendix A). It shows the bio-engineering methods for addressing bank erosion. Once this work is complete, the cost is assessed 50% to the property owner whose lands were restored and 50% to the entire watershed.

For the work identified at property Roll No. 400900, a site meeting was held on February 24, 2020, at 828 Lakeshore Rd E. The site visit confirmed that the existing bank had eroded back due to the fallen trees on the north bank. This site inspection confirmed the need for bank restoration, and the Bank Restoration and Improvement Program (BRIP) was developed in response to the identified need and as an alternative to the past use of concrete blocks.

The bio-engineering restoration is very different from the previous bank restoration completed in 2007, using large concrete blocks that required significant geotechnical engineering work to ensure the blocks were suitably supported on the bog peat lands (Section 3.2.1). The bio-engineered bank is intended to be a lighter, more natural use of materials to create an erosion resistant bank. The bio-engineered bank design relies on plant materials, root systems, and rocks to hold the layer between water and land in place. If the plant materials fail to establish themselves, then the 'system' of integrated materials can break down and fail. The key to successful bank restoration is healthy plant growth at the bank. It is recommended that the plants be native species consistent with the Port Colborne / Lake Erie ecosystem.

https://caroliniancanada.ca/legacy/FactSheets_IndSpecies.htm

4.1.4 Municipal Crossings

The existing north-south culvert crossing on Second Concession Rd is to remain in place and be connected to the realignment of the drain along the south side of Second Concession Rd instead of progressing south along the east side of Carl Rd. This reverses the flow within the roadside swale and requires the replacement of the private lane access culvert.

4.1.5 Private Crossings

An existing private crossing on Roll No. 271104000308300, identified as W-CS-011, is located at STA 5+200.

As indicated by the PCQ application for the expansion of Site 3 for extraction, this portion of the drain will be temporarily bypassed for extraction and then returned to a similar position as part of the quarry reinstatement of this property. This work is to be submitted for review, comment and approval at the time the work is to proceed.

New Culvert – 1645 Second Concession Rd

Proposed 1630 x 1120 CSPA – 6m in length on a 0.17% grade with no embedment. Installed at new grade line for the realigned Wignell Drain with a proposed lane crossing height of 182.60, backfilled with ‘A’ gravel and complete in compliance with General Details W.GD-02 and drawing detail GS-06.

The new culvert is 100% a special benefit of the owner, Port Colborne Quarry (PCQ).

Replacement Culvert – W-CS-015

The existing farm crossing on Roll No. 271104000311500, John Paul Fehrman, is a concrete box culvert 2350x1040 that is to be removed and replaced with a new CSP Elliptical at Station 4+197; proposed crossing height 178.750 with ‘A’ gravel backfill.

The proposed replacement pipe is 1727mm x 1092mm CSP Elliptical with a length of 9m installed at 0.5% grade and embedded 25mm (INV U/S 177.350 INV D/S 177.300) with a proposed design flow capacity of 2.27 cms.

The culvert is to be installed as per detail GS-06 on the Drawing General Details W.GD-02, and the typical 9m cost is split 50% to the owner and 50% to the watershed.

4.1.6 Utility Conflicts & Coordination

Not all utility locations and conflicts are known during design. Where a conflict between the drain and an existing utility has been identified, a program cost has been allocated for the protection or relocation of the utility during construction.

The proposed realignment has identified two utility impacts:

- The flow reversal of the existing roadside swale on the south side of Second Concession Rd identified a conflict with the existing Bell Telephone phone network. It is a requirement that Bell Telephone relocate this existing infrastructure where the new channel impacts the buried telephone lines.
- The realigned drain east of 6+700 will cross the existing property hydro service to 1645 Second Concession Rd. The owner is responsible for the cost of relocation. An option is to move the existing hydro pole south of the realigned drain channel.

4.1.7 Plans, Profiles & Specifications

The proposed Wignell Drain works are described in the attached Plans, Profile drawings, Specific Design Drawings, and Standard Detail Drawings, which are attached as Appendix A.

Project Specifications are attached as Appendix E.

4.1.8 Gate Structure Improvements

The following are planned improvements to the gate structure and are presented for consideration as an improvement under Section 78.

1. Gate automation using actuators. This replaces the existing motorized controls located on 2 of the 3 gates.

An investigation has shown that the existing drain bottom and existing gate bottom are no longer sealed. When the gate is fully down, it does not meet the bottom of the channel, which is bedrock. The proposed Gate Improvement Program includes the following and is illustrated in Figures 17 and 18: (Proposed Works, Gates 1 & 2)

1. Pour concrete sill in existing bedrock to a finished height 173.80. The concrete sill includes a keyway notch at 173.80 to create a seal between the gate and the drain bottom. The keyway shall have a back and bottom to seat the new gate bottom.
2. Extend existing gates using C channel steel (200mm x width to match the existing gate bottom (50mm) to seal/seat with the new concrete sill and maintain the existing closed top elevation 176.52.
3. Replace existing motors with actuators on the existing pedestals and threaded rods. Gate movement shall be from 173.80 to 175.52, providing a total opening movement of 1.72m.
4. The new actuators will provide local movement control and remote operation. Remote operation provides for the gates to close using an automatic closing sequence. The new closing time for the gates is 8 to 10 minutes instead of 20 to 30 minutes.
5. The automatic closing sequence will require health & safety upgrades to the existing physical arrangement on site to restrict access to the gate structure to only qualified personnel and prevent public access to the site. A warning light and alarm will warn of the pending gate movement for the operator and public safety. This includes a new west side access ramp to gate actuators and a west side stairs to the existing pump station lower level.

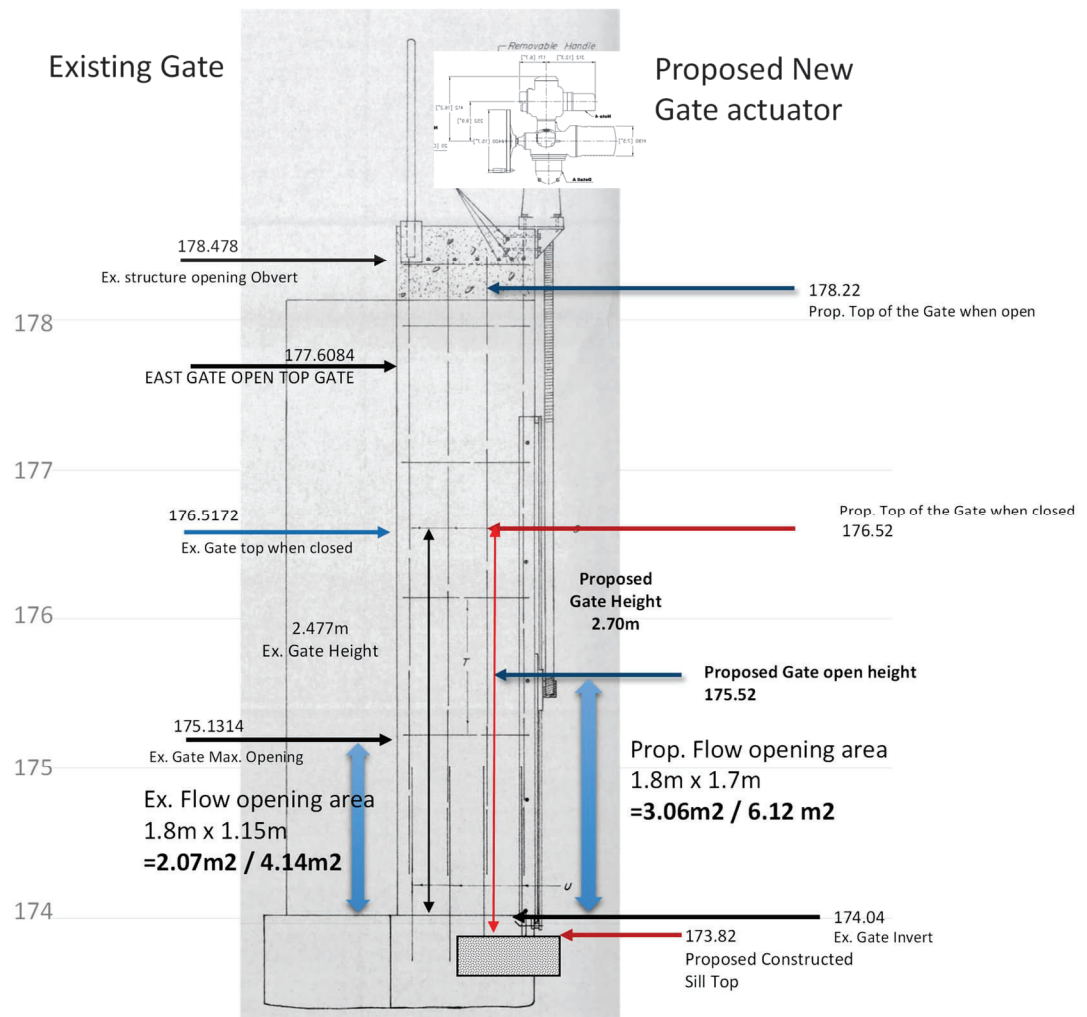


Figure 17 Proposed Wignell Gate Structure Improvements

The proposed gate improvement increases the cross-section flow by 50% but will only impact and increase runoff flows to the lake for high storm events where the runoff depth exceeds the flood elevation of 175.15m.

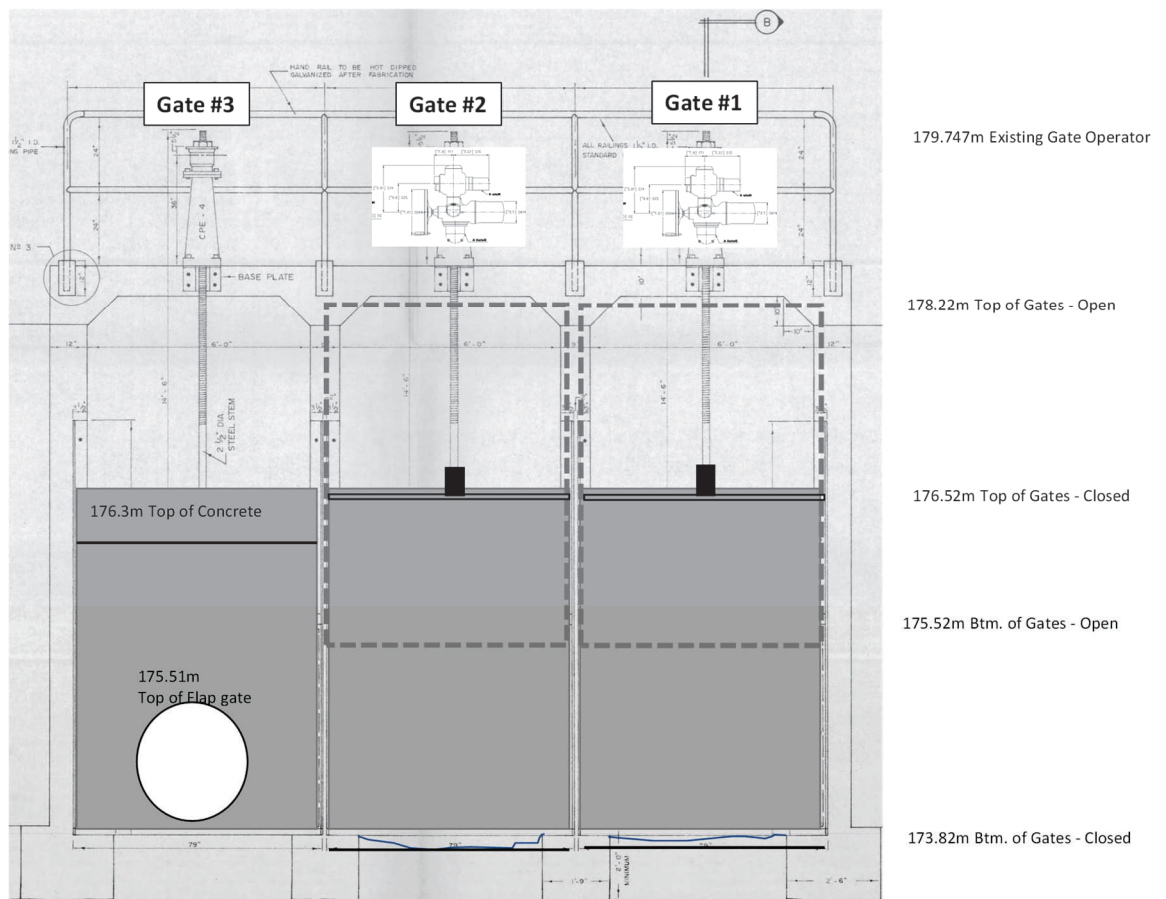


Figure 18 Gates 1, 2 & 3 Structure Improvements

4.2 Construction and Constructability

The following describes the specific requirements for drain construction.

4.2.1 Vegetation Removal

Vegetation, specifically trees, will be cut outside of time-restricted bird nesting periods. The remaining stumps are to remain in place unless they obstruct flow or are Ash tree stumps with re-growth already established. In those cases, the stump will be ground down where access permits to match the existing channel section. Ash re-growth will be removed.

Tree removal from the Top of the Bank to the Top of the Bank is to be 100 percent; however, tree removal within the work zone is at the discretion of the drainage superintendent while making every effort to preserve trees where possible. Where trees are removed in the work zone, they qualify for the tree replacement program per the tree qualifying criteria detailed in the project specifications and in accordance with City guidelines.

4.2.2 Spoil Material

All spoils and spoil handling practices will comply with applicable legislation, including O. Reg. 406/19: ON-SITE AND EXCESS SOIL MANAGEMENT filed December 4, 2019, under the Environmental Protection Act, R.S.O. 1990, c. E.19 and all other applicable legislation.

Where specified, excavated spoil material shall be disposed of and levelled a minimum of 2.5 m from the top of the bank to ensure that sediment does not re-enter the drain. Spoil placed next to the drain shall be spread to permit access across the berm area and shall be placed to a maximum height of 0.6m. Spoil excavated along existing travelled road allowances and on private property where requested shall be disposed of by the Contractor off-site. The benefiting property owner shall bear the cost of spoil trucked from the property.

Spoil shall be disposed of as noted in the description of the proposed work. The spoil will be disposed of adjacent to the drain unless otherwise specified. Should any property owner require that all or a portion of the spoil be trucked away from their property, the cost of compliance testing and trucking spoils shall be assessed totally to the property owner requesting same and will not form part of the total cost of the drainage system. The cost of trucking away spoil from any future maintenance work will be assessed directly to the property owner requesting the same. Where debris from vegetation removal is requested to be removed from the property or disposed with the agreement of the property owner, this cost is borne by the property owner.

Regarding the reaches of a drain within travelled Municipal Road allowances, the spoil will be trucked during the initial construction and any future maintenance work where there is no opportunity to dispose of the material adjacent to the allowance and channel. The spoil will be moved and disposed of within the Drain project limits first and only trucked away as a last option.

Access channels shall be provided through the levelled spoil material at every location where existing drainage outlets are visible and/or identified during construction by the Drainage Superintendent. The invert of the access channels shall be consistent with the drain cross-section at that location.

Spoil excavated from the drain shall be levelled in a manner suitable for cultivating crops where crops were previously cultivated. Where the drain is adjacent to a grassed area maintained by the owner, the spoil shall be levelled and re-seeded with grass to restore the area to a like or better condition before construction.

The realignment of the Wignell Drain adjacent to the designated wetland south and east of Carl Rd and Second Concession Rd is a challenge for soil disposal. As the drain is reversed from the westward-flowing roadside swale to an east-flowing municipal drain, there will be more excavated soil volume as the drain progresses eastward as the banks will be higher. Instead of spreading soil along the south bank, soil will be piled adjacent to the drain bank and not spread. This will allow flows exceeding the bank's south top to continue into the wetland. A consistent minimum top of the left bank is to be achieved.

4.2.2.1 Contaminated Spoils

Where soils are known to be contaminated but have been assessed to pose no human health risk, on site spreading adjacent to the drain will be the practice and acknowledge that the soils are not to be 'moved' off the property.

Where soils are to be removed from the property, a sample will be collected and analyzed for contamination before removal. Where that sample is shown to be contaminated and disposal of the soil will require disposal at a registered facility in compliance with O.Reg 406/19, the owner will be responsible for the costs of disposing of the contaminated soil from their property.

Once a contaminated sample is identified, the owner can choose to retain the soil on site instead of trucking for disposal to reduce their cost.

4.2.3 Sediment Control Basins

The addition of sedimentation basins to the Wignell Drain in three locations will assist with controlling sediment during maintenance and re-grading to the identified design grade line. Post-construction, these basins remain and continue to provide sedimentation control during precipitation events.

Sediment basins will be constructed at the locations and to the specifications indicated on the drawings. The Contractor will maintain these sediment basins during construction, as directed by the Engineer and/or designate. The basins are part of the Municipal Drain. The Municipality will maintain them in the future at the expense of all upstream land and road owners herein assessed, as shown on the attached assessment schedule. Properly maintained sediment basins reduce the frequency of drain maintenance clean out, thus reducing overall maintenance costs for property owners. The basins are to be inspected annually for an assessment of sediment depth. Sediment shall be removed when the measured depth exceeds half the constructed depth of the basin. The Drainage Superintendent may adjust the inspection schedule after some experience with the sediment basins within the watershed.

4.2.4 Revegetation

Drain banks and exposed soil areas within areas disturbed during the maintenance of the drain are to be seeded as quickly as possible by the contractor.

The drain banks should be seeded as quickly as possible after excavation, and the spoil should be seeded on the day of levelling. Seeding should occur in a manner that optimizes seed germination and establishment of vegetation before mid-October and after late April.

The seed mixture used shall be applied at a rate of 40 kg/ha in the following proportions:

Creeping red fescue	20 kg	50%
Perennial rye grass	8 kg	20%
Birdsfoot trefoil	12 kg	30%
Total	40 kg/ha	100%

4.2.5 Private Drain Connections

Where private connections are made to the Municipal Drain, the connections must comply with the City's standard connection designs. This includes the following connection types:

- Open channel connection – minimal allowance for grade and freeboard.
- Surface water flows – rip rap rock requirements for reducing or amending potential or evident erosion sites.

- Tile drain connections use PE or CSP pipe to connect to a receiving channel.
- Berm and Orifice Flow Control – connections designed to control runoff to specified flow rates.

Private connections are not part of the drain but are owned by the landowner and are their responsibility for construction and maintenance. Where the Drainage Superintendent or Engineer identifies a deficiency, the landowner is to make good the connection. Deficiencies may include eroded connections, blocked connections or poor connections. The landowner can accept having work done by the City on their behalf to make good the connection based on a 50/50 cost-sharing basis. Where the City identifies a deficiency and the repairs are not made by the landowner by the next cycle of drain maintenance, the City can make the required repairs and 100% of the cost will be assessed to the landowner.

4.3 Future Maintenance and Repair Provisions

The Drainage Act, Chapter D.17, Sections 74 through 84 governs future maintenance, improvement and repair to any Drainage Works constructed under a By-Law passed under this Act or any predecessor of this Act.

Upon completion of the Wignell Drain works described in this Report, the City will be responsible for future maintenance of the drain with the cost assessed to the upstream lands and roads using the Assessment Schedule in Appendix B and pro-rating the assessment based on the actual cost using the Outlet Liability Assessment – Section 23. Special Assessment shall not apply to maintenance work except where maintenance works are related to culvert/bridge replacement or upgrades.

4.4 Construction Summary

The following table lists construction activities by property, starting from the outlet and proceeding upstream.

Table 1 Wignell Drain Construction Summary

Property / Owner	Drain Side	From STA	To STA	Length	Work Description	
271104000400500 / White Stephen Christopher	Both	0-297	0-276.3	20.7	Maintenance of the Wignell Drain outlet to Lake Erie to address littoral drift sand is required on an ongoing as needed where needed basis.	Work is from the east side using an access lane for crossing private property to the outlet.
271104000400505 / McKay Terence	Both	0-276.3	0+000	276.3	Wignell Drain Outlet maintenance is to consist of vegetation control and grade maintenance.	Work is from the east side and west side where required.
ROW / Lakeshore Rd E	Both	0+000	0+024	24	Pumping Trailer access site to be improved. Control Structure Improvement Program.	Work is from Lakeshore Rd East Right of Way.
271104000404301 / 570466 Ontario Limited	Both	0+024	0+134.3	110.3	Bank spot maintenance as needed where needed.	Work is from either side of the north or south bank.

Property / Owner	Drain Side	From STA	To STA	Length	Work Description	
271104000400900 / MacNeil Robert Joseph F	Left	0+134.3	0+196.7	62.4	Bank Restoration and Improvement Program (BRIP) – focus on South Bank for improvement to restore +1m. Northside work is maintenance to reduce tree impacts.	Work is conducted from the south side; additional work on the north bank will be done from the north side.
271104000404300 / Nieuwland Kevin	Right	0+134.3	0+242.1	107.8	Bank & spot maintenance as needed where needed. BRIP inclusion option.	Work is from either side of the north or south bank.
271104000404320 / Nieuwland Kevin	Left	0+196.7	0+242.1	45.4	Bank & spot maintenance as needed where needed. BRIP inclusion option.	Work is from either side of the north or south bank.
271104000404200 / Mitchell Timothy J	Left	0+242.1	0+347.1	105	Bank & spot maintenance as needed where needed. BRIP inclusion option.	Work is from either side of the north or south bank.
271104000403720 / Vale Canada Limited	Right & Both	0+242.1	0+574	330.4	Bank & spot maintenance as needed where needed. BRIP inclusion option.	Work is from either side of the north or south bank.
2711-040-004-03800 / Arnold Alicia		0+437	0+570	130.6	Non-riparian owner impact.	Property is impacted by working zone on the south side.
ROW / Snider Rd	Right	0+574	2+100	1527.5	Spot maintenance as needed where needed. BRIP inclusion option.	Work is from either side of the west or east bank.
271104000403605 / Ramautarsingh Lindsey D	Left	0+594	0+606	12	Spot maintenance as needed where needed.	Work is from either side of the west or east bank.
271104000403700 / Vale Canada Limited	Left	0+606	1+036.2	430.2	Spot maintenance as needed where needed.	Work is from either side of the west or east bank.
271104000408400 / Vale Canada Limited	Left	1+036.2	1+297.2	261	Spot maintenance as needed where needed.	Work is from either side of the west or east bank.
271104000408600 / Vale Canada Limited	Left	1+297.2	1+539.7	242.5	Spot maintenance as needed where needed.	Work is from either side of the west or east bank.
271104000408700 / Schlenger Uszer	Left	1+539.6	2+059.6	520	Spot maintenance as needed where needed.	Work is from either side of the west or east bank.
271104000699500 / City of Port Colborne	Left	2+059.6	2+079.4	19.8	Culvert Cleaning & maintenance as required.	Work is from either side of the west or east bank.
271104000408715 / City of Port Colborne	Left	2+079.4	2+083.5	4.1	Spot maintenance as needed where needed.	Work is from either side of the west or east bank.
ROW / Snider Rd	Left	2+083.5	2+106	22.5	Spot maintenance as needed where needed.	Either bank within ROW
271104000407805 / City of Port Colborne	Both	2+100	2+405.3	305.3	Bank spot maintenance as needed where needed.	Work is from the south bank.
271104000499900 / City of Port Colborne	Right	2+405.3	2+500	94.7	Bank spot maintenance as needed where needed.	Work is from the south bank.
271104000405600 / Krieter Robert	Left & Both	2+405.3	2+558.7	153.4	Remove soil to grade, spread on bank and seed.	East Side and South Side work zone.
271104000405700 / Moskalyk John Joseph	Right & Both	2+558.7	3+033.5	474.8	Remove soil to grade, spread on bank and seed.	Work is from the South Bank and East Bank.
271104000407300 / Verdonk Sibbelina	Left	2+558.7	2+718	159.3	Remove soil to grade, spread on bank and seed.	Work is from the East Bank.

Property / Owner	Drain Side	From STA	To STA	Length	Work Description	
271104000405800 / Pace Christopher Alan	Both	3+033.5	3+131.4	97.9	Remove soil to grade, spread on bank and seed. Construct Sediment Basin W-SB03 @ STA 3+100	Work is from the south bank.
ROW / Lorraine Rd	Both	3+131.4	3151.7	20.3		
271104000317710 / Bankert Helen Irene	Both	3+151.7	3+351.4	199.7	Remove soil to grade, spread on bank and seed.	Southside work zone.
271104000315000 / Vandebeld Grace Elizabeth	Both & RB	3+351.4	3+806.1	454.7	Remove soil to grade, spread on bank and seed.	Southside work zone.
271104000317600 / Ribau Jeffrey	Left	3+500	3+538.4	38.4	Remove soil to grade, spread on bank and seed.	Southside work zone.
271104000317501 / Pagliaro Carlo	Left	3+538.4	3+589.5	51.1	Remove soil to grade, spread on bank and seed.	Southside work zone.
ROW / Killaly St E.	Both	3+806.1	3+840.2	34.1	Clean through culvert as required	
271104000316500 / Harrington Peter Anthony	Left	3+840.2	4+029.2	189	Remove soil to grade, spread on bank and seed.	North side work zone.
271104000316600 / Burke Michael	Right	3+843	3+920	77	Remove soil to grade, spread on bank and seed.	Option to work on the east side for 60m
271104000316700 / Burke Michael	Right	3+920	3+958.2	38.2	Remove soil to grade, spread on bank and seed.	North side work zone.
271104000316800 / Phillips Charles Milton	Right	3+958.2	3+973.6	15.4	Remove soil to grade, spread on bank and seed.	North side work zone.
271104000316900 / Reles David Leonard	Right	3+973.6	4+004.3	30.7	Remove soil to grade, spread on bank and seed.	North side work zone.
271104000317000 / King Carl Rodney	Right	4+004.3	4+029.2	24.9	Remove soil to grade, spread on bank and seed.	North side work zone.
271104000312400 / Wright Timothy James	Left	4+029.2	4+133.3	104.1	Remove soil to grade, spread on bank and seed.	North side work zone.
271104000317100 / Arsenaault Henri Claude	Right	4+029.2	4+054.4	25.2	Remove soil to grade, spread on bank and seed.	North side work zone.
271104000317200 / Gillespie Evan John	Right	4+054.4	4+077.7	23.3	Remove soil to grade, spread on bank and seed.	North side work zone.
271104000317400 / Smith Reginald Garfield	Right	4+077.7	4+096	18.3	Remove soil to grade, spread on bank and seed.	North side work zone.
271104000312300 / Hobbs Edward George	Right	4+096	4+133.2	37.3	Remove soil to grade, spread on bank and seed.	North side work zone.
ROW / Weaver Rd	Both	4+133.2	4+153.9	20.7	Remove soil to grade, spread on bank and seed.	
271104000311500 / Fehrman Paul Allan	Both	4+153.9	4+467.5	313.6	Remove soil to grade, spread on bank and seed.	Southside work zone.
271104000311201 / Wagner Edith Gail	Both	4+467.5	4+613.0	145.5	Remove soil to grade, spread on bank and seed.	Southside work zone.
271104000311202 / Ruston James Daryl	Both	4+613.0	4+698.5	85.5	Remove soil to grade, spread on bank and seed.	West side work zone.

Property / Owner	Drain Side	From STA	To STA	Length	Work Description	
ROW / HWY 3	Both	4+702.4	4+722.8	24.3		
271104000311300 / Rankin Engineering Inc	Both	4+722.5	4+838.8	116.3	Remove soil to grade, spread on bank and seed. Construct Sediment Basin W-SB02 @ STA 4+740	The work zone is from the east side.
271104000308201 / Fehrman Paul Allan	Both	4+838.8	5+023.4	184.6	Remove soil to grade, spread on bank and seed.	The work zone is from the east side.
271104000308300 / 1970065 Ontario Inc	Both	5+023.4	5+346.9	323.5	Remove soil to grade, spread on bank and seed.	The work zone is from the east side.
271104000308401 / Noel Marc Raymond	Both	5+346.9	5+464.6	117.7	Remove soil to grade, spread on bank and seed.	The work zone is from the east side.
271104000308400 / Li Yue	Both	5+464.6	5+568.2	103.6	Remove soil to grade, spread on bank and seed.	The work zone is from the east side.
271104000308100 / Dyck Abram Klassen	Both	5+568.2	5+669.6	101.4	Remove soil to grade, spread on bank and seed.	The work zone is from the east side.
271104000308000 / Jarry Terry Alain	Both	5+669.6	5+817.8	148.2	Remove soil to grade, spread on bank and seed.	The work zone is from the east side.
271104000308101 / Bury Alexander	Both	5+817.8	5+972.0	154.2	Remove soil to grade, spread on bank and seed.	The work zone is from the east side.
271104000311200 / Port Colborne Quarries Inc	Both	5+972.0	6+683.9	711.9	Re-align the Drain along the existing Property Line, Spread soils adjacent to the Drain. Replace existing roadside swale laneway culvert with new CSPA 1630x1120	The work zone is from the west side.
271104000315305 / 1970065 Ontario Inc	Left	6+683.9	6+902.4	218.5	Re-align the Drain along the existing Property Line and spread soils adjacent to the Drain. Berm old Drain path along the east side of Carl Rd	The work zone is from the north side.
ROW / Second Concession Rd	Right	6+683.9	6+902.4	218.5	Re-align the Drain along the existing Property Line and pile soils adjacent to the Drain on the south bank. Protect existing trees from harm where possible. No soil spreading to preserve existing bank heights.	
ROW / Carl Rd / Second Concession Rd	Both	6+902.4	6+922.0	20.3	Clean culverts of sediment.	
271104000506400 / 2023165 Ontario Inc	Both	6+922.0	6+922.1	0.1	End of Drain	

5 Drainage Works Financing

5.1 Cost of Works

The Drainage Act stipulates what is or is not eligible as a construction cost or cost of the proposed works. Many reports are prepared on the basis that a single aspect of construction will be undertaken; however, for the Wignell Drain, there may be one or several construction periods depending on the construction steps selected by the City of Port Colborne. The implementation of the proposed works is not detailed in this report and is implemented by the City of Port Colborne to make the most effective use of existing resources and ensure the most cost effective construction effort is achieved on behalf of the assessed landowners.

As required by the Drainage Act, Chapter D.17, Section 59(1), the Council may call a meeting if the contract price exceeds 133 percent of the estimated construction costs.

5.1.1 Admin & Engineering Costs

There are specific administration costs are identified for the Wignell Drain. They were provided by the City for inclusion in the report as follows:

- Debenture Interest - 2007 to 2017 in the amount of \$29,827.92
- Debenture Administrative Fee in the amount of \$ 6,065.29
- HST on the current engineering fees. Past Engineering HST excluded.

There are three primary engineering costs related to these works for the Wignell Drain. There are costs from three separate engineering companies working to prepare the report.

Wiebe Engineering was first hired to prepare the report. Wiebe performed work related to the Erosion Control works with the placement of the concrete blocks which is allocated directly with the erosion control works as a specific special assessment. Wiebe was paid \$92,511.44 for work completed on the Wignell, Michener and Port Colborne Drains.

Amec Foster Wheeler (formerly Amec) was appointed to conclude the assignment. Amec did not finish the report but were paid \$67,147.23.

These costs have been allocated to the respective drains using a drain area ratio as per the following table.

Table 2 Drain Area Ratios

Drain	Area, Ha	Area Ratio
Michener Drain Area	134.59	11.94%
Port Colborne Drain Area	349.389	31.01%
Wignell Drain Area	642.843	57.05%
Total:	1126.822	

The result is a cost allocation to Wignell for the portion of engineering fees for each of the two previous engineers.

The fees for EWA Engineering Inc. are recorded on the basis of the proposed fee for the preparation of each individual report, along with any associated changes in scope.

The court of revision for the Michener Drain and Port Colborne Drain directed the engineer to adjust the AMEC fee changed to the report by 50%, with the remaining fee paid by the City of Port Colborne levy.

The final engineering fees for the report are:

- Wiebe (2003) \$ 53,374.78
- Amec (2013) \$ 19,370.41 (COR adjusted)
- EWA Engineering Inc. (2024) \$208,579.62
- City CAD services \$ 50,147.50

A construction engineering fee was recorded for the work done to complete the 2007 concrete block retaining wall. This was paid to Wiebe Engineering for \$32,098.76. As EWA nor Amec provided any engineering related to the 2007 works, this fee is recorded separately from those above and assessed solely for the work related to the 2007 project.

In addition to these Engineering fees, there are Administration fees for the debenture used to finance the 2007 construction of the concrete block retaining wall. Those fees were presented in paragraph 1 of section 5.1. and are adjusted for the debenture portion used to finance the 2007 concrete block wall construction. The directly assessed values from the debenture applied to the 2007 block wall are as follows:

Interest paid on the debenture	\$17,209.32
Legal fees for the debenture	\$3,499.39

Also included in the costs for Administration and Engineering is a cost estimate for construction administration & inspection. \$3,500.00

For a total Administration and Engineering allocation to the cost of the drain of current fees of **\$363,712.21**

Including the Wiebe fees in 2007 **\$365,037.28**

5.1.2 Capital Construction Cost

Cost estimate has been organized into six segments for allocation across the watershed.

The total cost of the project is shown in the following table.

Table 3 Wignell Estimated Cost of Construction

Cost Item	Report Estimate
Estimated Cost of Construction	\$966,934.98
Previous Construction Works Completed but not Assessed.	\$244,423.06
Eligible Administration Costs	\$413,020.28
Drain Allowances	\$1,642,278.16
	Forecasted Total Costs
	\$1,642,278.16

5.1.3 Previous Works Completed

Additional to this estimate of construction cost is the cost for work already completed.

5.1.3.1 Construction Already Completed

The total cost of the works previously constructed is as follows:

2006/2007 Block Bank Construction	\$273,353.22
2020 single lane constructed to access Wignell Outlet Roll No. 271104000400500 and Roll No. 271104000400305	\$3,168.60

For a total cost of previous works: **\$276,521.82**

5.2 Maintenance & Program Costs

Included in the estimated cost of construction are allocations for costs related to drain maintenance works including vegetation removal and re-grading.

There are also costs for programs of drain improvement specifically related to the Wignell Gate Structure. The structure originally was modified to support three additional forms of pumping. The improvement program removes the instream discharge piping from the structure. The structural assessment conducted by Insyght engineering identified that the existing handrails are not code compliant. A program to revise handrails to be code compliant will be performed along with changes to restrict access. This improvement program is budgeted and will be conducted over a suitable schedule that may be staged to best optimize the work and comply with environmental regulations for instream works.

5.3 Principles of Assessment

The following are general and specific principles used to assess costs for the Wignell Drain according to the Regulations formed under the Drainage Act using our understanding of the Act and seeking the fairest methods to share costs to ratepayers within the Wignell Drain Watershed.

1. Assessments are a method to calculate a contributing property's share of drainage works, hereafter referred to as a Drain.
2. Each Drain is defined by a fixed point of commencement that traverses to a fixed Outlet, which may be a receiver or another Drain.
3. A property contributes to drainage work if any portion of the property directly or indirectly contributes to a runoff flow to the Drain.
4. A Drain is any constructed or existing natural method of conveyance or stormwater management function that moves or controls water from one collection point to a discharge point, an Outlet.
5. The use of a property, farming, residential, or vacant, does not define the benefit of the Drain. The benefit of a drain is realized equally among all properties with runoff to the Drain.
6. An excess or additional benefit is realized for any property or group of properties for which a higher standard of drainage service is required for the specific use of a property for which a higher value is realized.

For example, where a market garden farm requires additional pumping for either irrigation or reducing the water surface in the drain, then the additional costs for that are borne by the benefitting lands.

Similarly, where a property or group of properties is provided with a lower standard of drainage service or where such property or properties provides a stormwater management function within the drainage works of the Drain, the value of the lower service or function is determined at a rate commensurate with the benefit to the drain.

As an example, where a property converts a portion of their lands (or the entire property) to a wetland or other stormwater management feature that reduces the peak flow of the runoff, thereby reducing or enhancing the capacity of the Drain to improve drainage and reduce flooding, then a commensurate benefit is realized to the volume of water removed from the runoff hydrograph.

Where the volume of detained runoff is small relative to the drain capacity, this contribution is deemed negligible. Where the volume detained is below 1% of the total runoff volume for the Drain, there is no real benefit realized for an individual Stormwater Management Feature.

The capacity of the Drain is determined based on a hydrologic model forecast of precipitation based runoff. Therefore, each property realizes a drain benefit based on the proportion of predicted runoff for their property. Predicted runoff is a product of the following attributes, which are determined for each property:

- a. Area contributing to runoff;
- b. Land use as it relates to runoff;

- c. Land topography;
 - d. Proportion of hard surfaces vs soft surfaces as they relate to infiltration; and
 - e. Stormwater management features specially built to reduce the rate of runoff.
9. A benefit is realized for a property that causes a physical change in the Drain works to serve a particular use or surface water benefit to the property. An example is a culvert, which provides access to a property across a drain.
10. A benefit/assessment is realized for Municipal, Regional or Provincial lands held as Rights of Way that cause or require additional infrastructure, effort or costs related to the Drain. (Section 26)
11. Where a cost to the drain is realized through effort during construction or otherwise for the protection of flora, fauna or quantity or quality of stormwater runoff, this cost is born proportionally amongst all watershed contributing owners at the same rate as established for Drain benefit.
12. A Drain already exists, and the proposed assessment is to recognize a service or benefit that already exists and is being confirmed to exist through the creation of the report and assessment schedule.
13. For utilities that require additional work, changes in design, or protection during construction, those costs are borne by the owner of the utility.

A modern infrastructure concept is missing from the Drainage Act or is not explicitly directed regarding assessment. That concept is service levels of the drain. For an urban area, explicit service levels are documented through municipal design standards, and expectations are often codified into Manuals of Operation that establish the expected service levels. While there are aspects of this in the Drainage Act, service levels and the possibility that they may vary from property to property or from region to region within a Drain area are not explicitly discussed. The concept is that for a basic service level for a farm, the requirement is for flooding not to be sustained such that plants are drowned. However, depth and damage have no direct link, such as what is accepted in an urban area. Rural residential properties are compared with farm properties where the farm service level is to have the flooding removed within 24 to 36 hours, while the residential service level expectation is to have no flooding within the property limits that might enter a building below grade and cause damage. Flooding depth is to be kept below all sill levels.

This distinct difference in service level expectation was complicated in the Wignell municipal drains by a further increased service level expectation established by the market garden farm operations and the practice of controlling flood elevations using mechanical pumping systems.

While efforts within the drain design and assessment have been made to address water quality and quantity, there are limits within the Drainage Act to address water quality as a direct benefit of drainage.

Benefit (Section 22)

This Assessment is based on the creation of land value through the creation of a new or additional drainage system. The Port Colborne, Michener, and Wignell Drains already exist and have for some time (more than 100 years).

Commencing at Station 5+970, the original drain alignment that proceeded to the west as far as the former Carl Rd right of way allowance, the Wignell drain is proposed to be re-aligned to the north along the property line to Second Concession Rd. With the purchase of these lands for the development of extraction, the Port Colborne Quarry identified that the expansion of the quarry would consume the western upper portion of the Drain. While the actual timing of this occurrence is unknown, it was considered prudent to avoid investing in drain maintenance for the portion the quarry will eventually eliminate and instead re-align as proposed to continue serving the farms north of the Second Concession Road.

The benefit of this re-alignment is entirely realized by the quarry and the City of Port Colborne by having a sufficient outlet for the culverts located at the intersection of Carl Rd and Second Concession Rd. The farms and properties north of Second Concession Rd do not realize an increased benefit but simply the preservation of an existing sufficient outlet for drainage.

Outlet Liability (Section 23)

This is the primary basis for the assessment of the maintenance and drain works. Assessment is based on each property’s contributing runoff. This is determined by the area flowing to the drain and runoff factor C. The runoff factor, C, is based on the Rational Method for predicting peak runoff. The Rational Method does not predict the runoff volume and is not used to assess Stormwater Management Facilities (SWF) that may be present on site.

The C factor for assessing property runoff is selected based on the property zoning. Where a property is not currently farmed but is zoned for farming, then a C factor is selected based on the potential use of the property. C factors are not adjusted for variations in Residential properties. Residential properties with or without buildings are assigned the same C factor. Thus, the C factor is not a current prediction of runoff for an individual property but a Factor to assess the potential runoff based on the property’s potential use.

The following Table will be used to determine C Factor values in the Runoff Outlet Factor assessment.

Table 4 Land Use and C Factors

PropCode	CATEGORY	DESCRIPTION	C-Factor Low	C-Factor High
100	LAND	Vacant residential land not on water	10	25
105	LAND	Vacant commercial land		
110	LAND	Vacant residential/recreational land on water		
200	FARM	Farm property without any buildings/structures	20	55
201	FARM	Farm with residence – with or without secondary structures; no farm outbuildings		
210	FARM	Farm without residence – with secondary structures; with farm outbuildings		
211	FARM	Farm with residence – with or without secondary structures; with farm outbuildings		
221	FARM	Farm with residence – with commercial/industrial operation		
228	FARM	Farm with gravel pit	12	50
230	FARM	Intensive farm operation – without residence	20	50
231	FARM	Intensive farm operation – with residence		
234	FARM	Large scale poultry operation	20	55
244	FARM	Managed forest property, residence not on water	20	30
260	FARM	Vacant residential/commercial/ industrial land owned by a non-farmer with a portion being farmed	20	55

PropCode	CATEGORY	DESCRIPTION	C-Factor Low	C-Factor High
261	FARM	Land owned by a non-farmer improved with a non-farm residence, with a portion being farmed.		
301	RESIDENTIAL	Single family detached (not on water)	15	40
302	RESIDENTIAL	More than one structure used for residential purposes with at least one of the structures occupied permanently		
303	RESIDENTIAL	Residence with a commercial unit		
313	RESIDENTIAL	Single family detached on water year round residence		
322	RESIDENTIAL	Semi-detached residence with both units under one ownership, two residential homes sharing a common center wall.		
332	RESIDENTIAL	Typically, it is a duplex residential structure with two self-contained units.		
334	RESIDENTIAL	Residential property with four self-contained units		
383	RESIDENTIAL	Bed and breakfast establishment		
391	RESIDENTIAL	Seasonal/recreational dwelling – first tier on water		
392	RESIDENTIAL	Seasonal/recreational dwelling – second tier to water		
405	COMMERCIAL	Office use converted from a house	20	65
410	COMMERCIAL	Retail – one storey, generally under 10,000 s.f.		
421	COMMERCIAL	Specialty automotive shop/auto repair/ collision service/car or truck wash		
441	COMMERCIAL	Tavern/public house/small hotel		
490	COMMERCIAL	Golf course	12	35
510	INDUSTRIAL	Heavy manufacturing (non-automotive)	45	85
518	INDUSTRIAL	Smelter/ore processing		
520	INDUSTRIAL	Standard industrial properties not specifically identified by other industrial Property Codes		
590	INDUSTRIAL	Water treatment/filtration/water towers/pumping station	*	*
593	INDUSTRIAL	Gravel pit, quarry, sand pit	*	*
597	INDUSTRIAL	Railway right-of-way	40	65
598	INDUSTRIAL	Railway buildings and lands described as assessable in the Assessment Act		
605	INSTITUTIONAL	School (elementary or secondary, including private)	35	50
702	SPECIAL PURPOSE	Cemetery	35	65
710	SPECIAL PURPOSE	Recreational sport club – non-commercial (excludes golf clubs and ski resorts)	35	85
715	SPECIAL PURPOSE	Racetrack – auto	45	85
735	SPECIAL PURPOSE	Assembly hall, community hall	30	85
	ROW	Single lane Municipal Roadway	75	95
	ROW	unopened road allowance	65	85
	ROW	Regional or MTO	90	98

* C factor values are situationally assigned based on land use.

The following drain features are part of the whole system and are paid for through the outlet assessment:

- Channel Clearing and Re-grading
- Sediment Basins
- Where a channel is re-aligned to improve the drain function and not caused by property use, the cost of the channel re-alignment is assessed as an outlet assessment.

Special Benefit (Section 24)

The following are assessed costs considered special benefits:

- Culverts,
- Fordings,
- Closed Conduit conveyance (piped flow)
- Erosion protection works (such as was constructed on the Wignell Drain North side of Mt. Saint Joseph Cemetery)
- Channel re-alignment for property use, such as quarry expansion.

The cost of a culvert is assessed against the property owner based on a 50/50 split in the cost assessed against the drain watershed. Construction costs are based on the City's typical design standard. Additional costs, headwalls, etc., are at the owner's cost unless required by the Engineer to meet requirements.

The Wignell Drain above the existing station 5+700 is to be re-aligned to reflect the future quarry expansion that will capture the existing drain alignment that progresses across private lands to the former Carl Rd Right of Way. At present, the Drain requires clearing vegetation growth within the channel and re-establishing the channel design shape and grade. This cost will be deferred in recognition of the future quarry expansion and the cost of relocating the drain. Therefore, the cost of re-aligning the Drain is to be composed of an outlet assessment based on the cost to re-grade and the special benefit to the Quarry lands that a re-location provides.

In addition to assessed costs considered for special benefits, there is also recognition through the use of the Special Benefit for stormwater management facilities within the watershed that reduce the peak flow used to determine the outlet assessment. These facilities that may already exist in the watershed are recognized as having a benefit in reducing peak flow by determining whether the available volume is greater than the 24-hour peak flow volume predicted for the 1:2-year design storm.

- Site Specific Stormwater Management (SWM) Facilities
 - Wetlands,
 - Ponds, (natural and stormwater)
- Natural occurring features
 - Kettle lakes, and
 - Bog lands.
- Artificial runoff capture, such as Quarry lands or other features that collect runoff but do not outlet it to the Drain during the peak flow of the event.

Special Assessment (Section 26)

There are special assessments, as recognized under the Act, for public (not private) roads and utilities that have or require additional costs to the drainage system.

In addition to the projected assessments for Right of Way lands as determined by the outlet assessment, any other costs for road crossings or protection of utilities during construction are assessed to the road owner or utility owner. In this case, all existing road culverts are to be maintained as is, and additional costs are not planned or identified.

Additional costs related to impacted utilities such as Enbridge. These costs can be additional effort during construction to protect or meet site supervision requirements by the utility. Also included are costs to move infrastructure, if required by site conditions.

5.3.1 Allowances:

1. Where a Drain assessment schedule already exists, and a prior maintenance and assessment schedule is known to exist, a Section 29 allowance is accepted and recognized through a past report and schedule unless it can be shown otherwise.
2. Where a Drain is re-aligned to a new path, a Section 29 allowance for land taken is recognized. This can be amended by the restoration of any lands to the same owner by the same re-alignment. Thus, a net allowance can be recognized where that is shown to be the case.
3. Where previously no Drain was recognized but already existed as a flow path, then a Section 31 allowance can be realized along with a one-time creation of a current and future easement for Drain maintenance activities as a Section 29 allowance. This is specifically for the creation of Branch Drains.
4. All property valuations are based on the same basic valuation per the Schedule of Costs.
5. Any tree or feature placed within a drainage work right of access for maintenance is not eligible for compensation.

Section 29 Allowance

(One-time payment for land taken)

Where a Drain already exists and has had maintenance in the past, a work zone is assumed to exist already, and a one-time payment for the work zone easement has been made. No further payment for a work zone or easement is deemed to be required based on the pre-existing work zone, regardless of whether that is known to exist or shown to exist in an explicit reference in a previous Engineer's report.

Where a Drain re-alignment is proposed, then a Section 29 allowance is determined. The determination is based on a 10m work zone parallel to one side of the drain commencing at the Top of the Bank. The Drainage Engineer determines the side from which work is done and shown on the Plans for Construction. The value is based on a single value of land figure as shown in the Schedule of Costs. The access is intermittent, with the owner retaining ownership and access/use of the land for farming or otherwise; a factor in the assessment value of land is applied. Since the work zone is likely to be occupied on a 20-year maintenance cycle, a 1/20 factor is applied.

Where a buffer is created that changes the use of the land adjacent to the drain, a payment for land taken based on the change in land use value is made.

Section 30 Allowance

(Payment for damages during construction)

Awarded where work on the drain, such as maintenance, that damages crops which can not be restored. Does not apply to grass or any other ornamental feature restored to a similar condition as existed pre-construction.

For any trees removed for construction with a greater diameter than 150mm at breast height (DBH), compensation in the form of saplings is offered. Where a tree is removed, 2 saplings of a variety native to the area are offered for planting outside the work zone as compensation, and no award for compensation is made.

Section 31 Allowance
(Incorporate a Private Drain)

This type of allowance is to credit the construction effort of a private drain as it relates to the private drain being incorporated into a municipal Drain.

This can be applied to the following:

- Wignell Branch Drain #2, and
- Wignell Branch Drain #3.

The value of the private drain is dependent on the condition and contribution to the function of the Drain. The cost to construct a similar channel would be based on the Schedule of Prices for valuation purposes. The cost to maintain it would be subtracted.

Section 32 Allowance
(Insufficient Outlet)

This compensates affected owners for whom lands are not sufficiently drained by the service level provided by the Drain or where lands are discharged into instead of having a sufficient outlet.

Section 33 Allowance
(Loss of Access)

Where a re-aligned Drain crosses the property and cuts off access, an allowance can be granted. This is offered as compensation where the landowner accepts the loss of access as the lessor of the cost to construct a culvert, bridge or fording to provide access. It can also be used to recognize a wetland where drainage is deferred in favour of the wetland's use of storage of runoff within the Watershed.

No occurrences of this within the Wignell watershed are newly recognized within this report. There may be previous occurrences assumed to have been recognized in earlier reports.

5.3.2 General Instructions to Property Owners, Road Authorities and Public Utilities

The principles of the Drainage Act are:

- Drainage is a collective good that benefits all landowners. However, drainage does not have to benefit all landowners equally.
- All landowners cooperatively fund the drainage works proposed. There is no direct financial government role in the drainage works other than administrative.
- Landowners are assessed a financial share of the cost for the drainage works based on their respective drainage benefit.
- All drainage costs are borne by landowners, including allowances.
- Drainage is provided based on an identified service level for a specified size of storm. The standard storm, 1 in 5-year frequency, for basic open channel design

is 68.9mm over 24 hours. A storm of a larger size or intensity may cause flooding. The tile placed at the bottom of an open channel is provided for drainage, not conveyance capacity.

For more details, refer to the Wignell Watershed Hydrology and Hydraulics Report.

A best effort has been made to compose a fair and reasonable assessment of costs to each portion of the contributing lands.

5.3.3 Grants

Owners of qualifying agricultural land are presently eligible for a grant from the Ontario Ministry of Agriculture and Food of up to one-third of the cost of their assessment. This grant is applied for by the City and applied to the property owners' assessment at the time of final billing. The Assessment Schedule indicates lands that, based on information provided by the municipality, qualify for the agricultural land use rebate. The final determination of eligibility is the decision of the Ontario Ministry of Agriculture and Food. To be eligible for a grant, the property owner must have a Farm Property Class Tax Rate for the lands to be drained.

For additional information on the Agricultural Drainage Infrastructure Program, refer to the OMAFRA website at www.omafra.gov.on.ca.

The City of Port Colborne provided property tax class information on eligible properties, as shown in Figure 19.

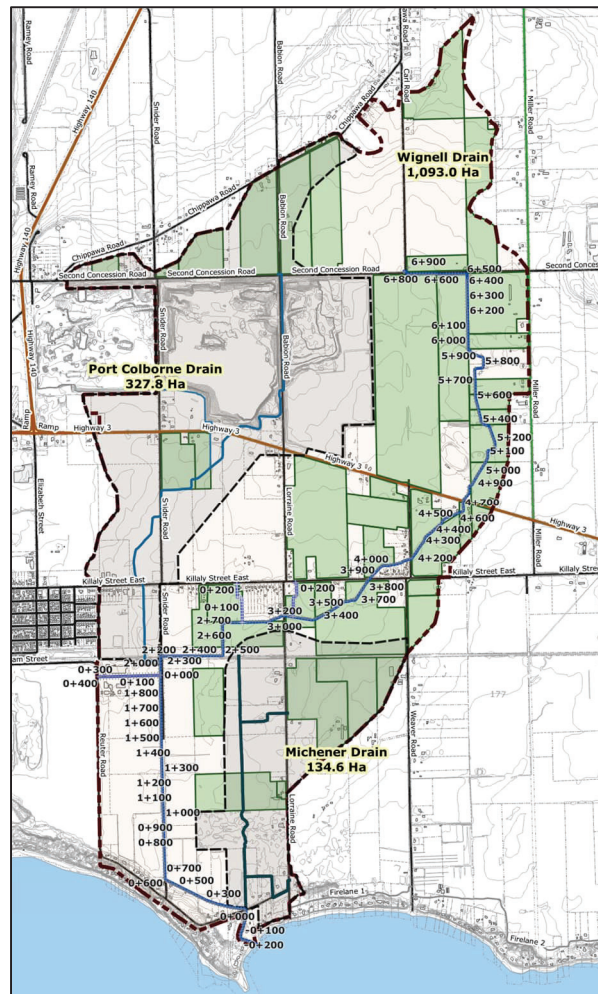


Figure 19 Wignell Drain and Farmlands

5.4 Wignell Drain Improvements & Maintenance

The Assessment Tables are included in Appendix B. The following sections provide a summary of those calculations.

The assessment is organized by area of the watershed affected. In addition to the Branch Drains (3), six intervals are used to determine assessment. Those intervals are as follows.

- Interval 1: STA 5+978 to 6+922 Wignell Re-Alignment
- Interval 2: STA 2+450 to 5+978 Channel Maintenance
- Interval 3: STA 0+439 to 0+595 Bank Erosion Works – 2007
- Interval 4: STA 0+020 to 0+380 BRIP (Bank Restoration & Improvement Program)
- Interval 5: STA 0+000 to 2+450 Spot Maintenance
- Interval 6: STA 0-297 to 6+918 Outlet Improvements & Maintenance

Assessments are determined based on the upstream areas from each of these Intervals. Interval 5 is the area upstream of the crossing located at Lakeshore Rd E, and Interval 6 is the entire watershed, including the properties at the outlet. The other four regions are shown in Figure 20.

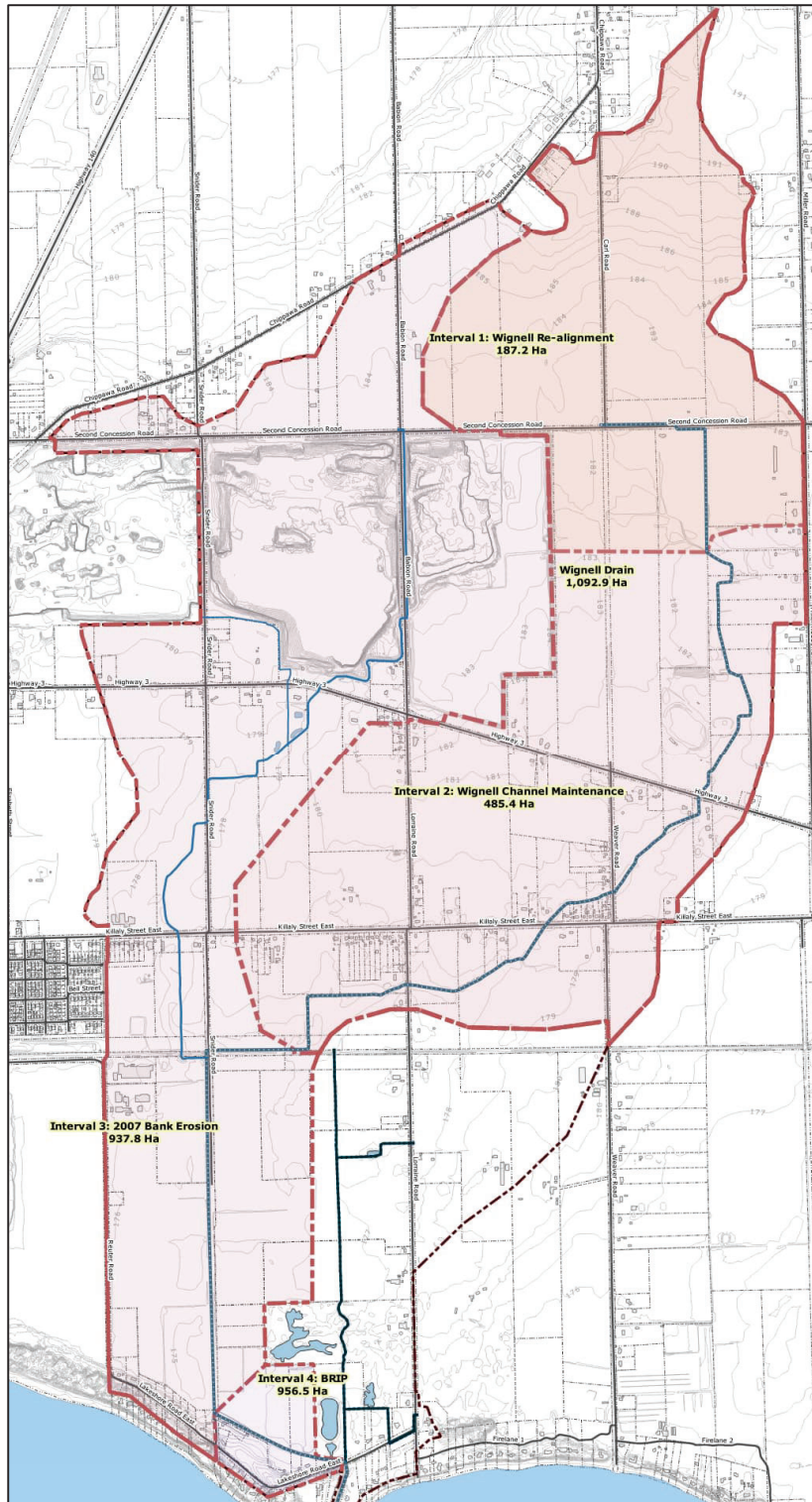


Figure 20 Wignell Watershed Assessment Intervals

Costs for Admin and Engineering are pro-rated for each of the Intervals based on the area upstream of the works except for the 2007 Erosion Control Works.

Interval	Area, Ha	Interval Ratio
Interval 1: STA 5+978 to 6+918 Wignell Re-Alignment	187.165	17%
Interval 2: STA 2+450 to 5+978 Channel Maintenance	485.391	44%
Interval 3: STA 0+439 to 0+595 Bank Erosion Works – 2007	937.841	86%
Interval 4: STA 0+020 to 0+380 BRIP (Bank Restoration & Improvement Program)	956.538	88%
Interval 5: STA 0+000 to 2+450 Spot Maintenance	956.538	88%
Interval 6: STA 0-297 to 6+918 Gate Improvements & Outlet Maintenance	1092.854	100%

Construction costs are allocated using the Intervals and the interval ratio along with the Administration and Engineering Costs. This is true for 5 of the 6 intervals; however, interval 3 is for past constructed work and has already recorded specific engineering costs and administration costs (debenture) and no additional engineering costs are assigned.

5.4.1 Bower Drain Branch

The Bower Drain already exists, and it is presumed that all former allowances that would have been granted in recognition of the drain were previously recognized, and no further outstanding allowances are detailed.

A maintenance cost to clean and maintain the existing grade is estimated at \$3,311.79, with a portion for Admin & Engineering is a total cost of \$2,449.65, which will be allocated to all upstream properties on the outlet liability/benefit on a prorated runoff basis; Section 23 assessment.

A special assessment (Section 26) is assigned to the City of Port Colborne for road drainage at \$1,885 and the remainder is assessed to upstream lands using Section 23 for outlet liability.

5.4.2 Wignell Branch Drain #2

This pre-existing channel conveys runoff from north of Killaly St E through a 900mm roadside culvert that goes south past the existing house into an open channel and outlets to the Wignell Drain. This channel outlets the roadway culvert across private lands and is not currently identified as a municipal drain, but based on conveying flow from multiple private lands, it should be a municipal drain. As this is a pre-existing channel not yet recognized as a municipal drain, allowances for previous work and for land taken are required and calculated.

Based on a road authority Petition 4 request, this existing channel is being made into a municipal drain. However, the existing CSP is too close to the existing house, and a new channel is proposed to be wholly located on the farm to the west. The existing channel

is 203m, and the proposed re-aligned channel is 120.2m. All spoils are spread on the adjacent farmland with an associated Section 30 crop damage allowance.

The estimated total cost is \$28,165.84 includes an allowance payment to the existing channel landowners of \$6,690.55. A total benefit of \$17,969 is assessed to the City as a roadway special benefit (Section 26). There is a direct riparian benefit assessed to the adjacent landowner for the drain re-alignment of 84m in the amount of \$168 and \$24 for the 3m re-aligned to the Killaly right of way. The remainder of the cost of \$10,005.30 is assessed to the upstream landowners as a Section 23 outlet liability assessment.

5.4.3 Wignell Branch Drain #3

This pre-existing channel conveys runoff from north of Killaly St E and crosses through a recently constructed double wall 450mm PE culvert with a re-graded channel part-way to the outlet to Wignell Drain.

The recently lowered 450mm culvert is placed on a 0.24% grade and has been determined through analysis with HY-8 for a design flow of the 1:5 yr storm of 0.49 CMS as being too small and should be replaced with a 600mm smooth wall HDPE culvert on the same grade, (double wall Boss 200 320 KPa or approved equal). The responsible Road Agency, in this case, the City, will pay all costs for this work.

As this is a pre-existing channel not yet recognized as a municipal drain, allowances for previous work and for land taken are required and calculated as \$7,329.00.

The proposed construction cost is nearly identical to the allocation of previous construction, which reflects the expectation that only very minor channel improvements through the length of the drain need to be made. The primary purpose is to ensure consistent grade and channel sections through the length of the drain. There is a direct benefit realized from the drain to the properties on either side of the drain. For most of the length the proposed works, there isn't an improvement on the existing drain. Hence, no Section 22 benefits are assessed to the two adjacent property owners.

The total estimated drainage costs, including maintenance work & culvert replacement, administration costs and allowances, is \$37,559.04. Of that, \$22,082.97 is a special assessment (Section 26) assigned to the City for the culvert including roadway works and a portion of the Admin & Engineering cost. The remainder, \$15,476.07, is assessed to the upstream landowners as a Section 23 outlet liability assessment.

Previous works have exposed a pipe that appears to be a gas line that may or may not be active. It's recommended that the relevant utility lower or remove the exposed pipe at their own expense.

5.4.4 Interval 1: Wignell Drain Re-Alignment STA 5+978 to 6+918

The existing drain above STA 5+978 to the 2 existing CSPA culverts at Carl Rd and Second Concession Rd is compromised for both grade and for channel cross-section. The Port Colborne Quarry Extension 3 application has been received, and the quarry's planned expansion will capture the drain's upper portion. The date when this may occur is not known. However, investing in maintenance on this portion of the drain prior to it being abandoned for the proposed quarry expansion is not a good investment of watershed money.

From STA 5+978 to the existing CSPA culvert crossing Carl Rd STA 6+674, the alignment of the drain is shifted to the south side of Second Concession Rd. It is moved off the road allowance for the east portion fronting Roll No. 271104000311200 and within the road allowance adjacent to the existing wetland on Roll No. 271104000315305. This move-off would generally require an allowance for land taking for the channel and work zone; however, as this work remains on the same properties as the originating drain, no new allowances are made for the taking of land for the re-alignment. An abutting benefit is assessed to that property, and a re-alignment benefit (Sect. 24) is assessed to Port Colborne Quarries (PCQ), recognizing the company as the principal beneficiary of the realignment.

The additional cost of the re-alignment from STA 5+700 to STA 6+378, which is the relocated Second Concession Rd crossing, is assessed to Property Roll No. 271104000311200. Additionally, an abutting benefit is also assessed. This is a linear distance of 625m for assessed Section 22 benefit.

The existing culverts crossing Second Concession Rd and crossing Carl Rd are to remain as is with minor maintenance to ensure the culvert full area is available for conveyance.

Additional to these costs will be Administration and Engineering Costs related to the design as per the interval ratio for Interval 1.

The total estimate of the cost of re-alignment is \$178,802.91.

5.4.5 Interval 2: Wignell Drain Channel Maintenance STA 2+450 to 5+978

A grade and channel maintenance program from STA 2+450 to 5+978, including vegetation removal (ash trees), is recommended. As a predominantly maintenance activity, these costs will be assessed as Section 23 Outlet Benefit / Outlet Liability assessments using the runoff ratio as discussed.

Additional costs will be the full engineering and administration costs minus any costs directly assigned to benefit assessments. This includes a culvert replacement on property Roll No. 271104000311500 for John Paul Fehrman. The owner is responsible for 50% of the cost of a 9m access culvert; the remaining cost is assessed to the watershed.

With the Runoff Ratio, there is a Stormwater Management Facility, SWM and SWMF (reduction in Section 23 QRF) that can be applied for those properties that can demonstrate a runoff amendment structure that reduces peak flow contributions to the drain subject to evaluation and confirmation by the Drainage Superintendent and the Engineer. An application for recognition of SWMF is not recommended to be adjusted by 100%. Some portion of the Section 23 assessment is to remain and be reflective of the volume of peak flow adjusted.

For the submission of this report, no SWMF assessments are recognized, and the individual property owners can request an assessment; the Engineer will recognize this on project completion or at a later date to be determined as an assessment adjustment.

The total estimate of the cost of channel maintenance is \$241,498.90.

5.4.6 Interval 3: Erosion Control Works – 2007 STA 0+439 to 0+595

The construction of this work was started in 2006 but formally completed in 2007. The cost of the construction works was \$241,254.46, and with the inclusion of the Administration portion, which includes the cost of the debenture (interest and fee), the total cost is \$290,562.54.

Only three indicated properties were affected by the erosion control work to stop bank erosion on the south bank of the Wignell Drain between STA 0+438 and 0+595. The total length of the wall is given as 157m.

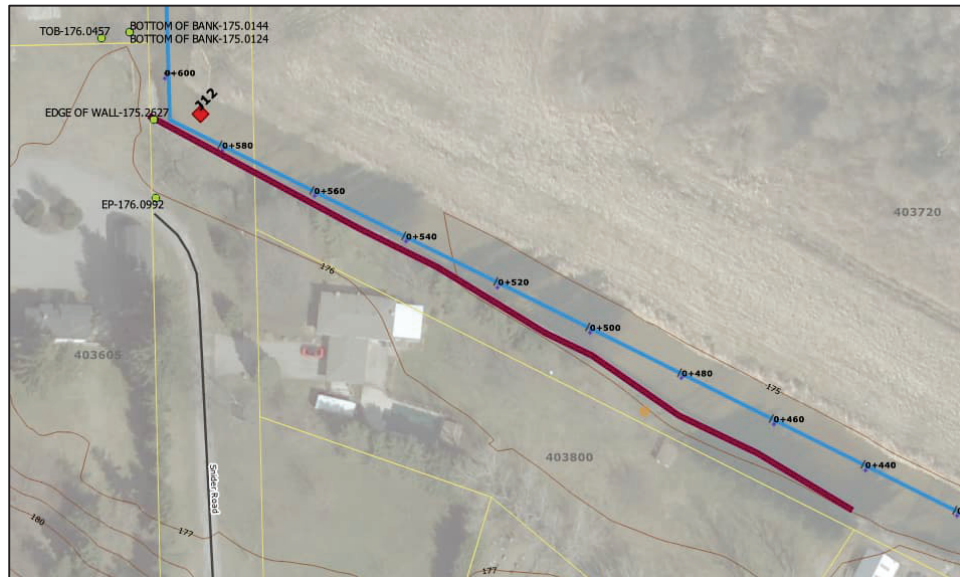


Figure 21 Erosion Protection Works – 2007 Assessment Parcels

There are three properties affected (protected) by the constructed works:

- The City of Port Colborne has the Snider Rd Right of Way (ROW), the wall's westernmost limit.
- The wall is constructed wholly on the Vale Property (Roll No. 271104000403720).
- The private property that originated the request for the work (Roll No. 271104000403800).

No Allowances have been granted based on this work. A review of aerial photography from 2000 indicates that the erosion protection wall was mainly constructed on the southern bank, as shown in 2000.

These properties have been assessed the cost of the works based on the length of their property affected and their respective benefits. The lengths used are as follows:

Table 5 Wignell Erosion Protection – 2007 Assessment

Legal Text	Roll No.	Length, m	Ratio
CON 1 PT LOT 22	271104000403800	128	44.9%

HUMBERSTONE CON 1 PT LOT 22	271104000403720	134	47.0%
Snider Road ROW	ROW	23	8.1%

The constructed cost per unit of length for this project is \$1,850.72/m.

The portion of this work allocated to the riparian owners is determined to be 14% of the total costs. This amount was then allocated to the three affected landowners, Vale, Arnold and Snider Rd ROW, based on pro-rated lengths affected, as shown in Table 6.

Table 6 Erosion Control Works 2007 Assessment Summary

Outlet Liability Assessment (Section 23)			
	Private Lands		\$227,793.21
	Road Right of Way Lands		\$20,401.63
	Total - Outlet Liability Assessment (Section 23)		\$248,194.84
Special Benefit Assessment (Section 24)			
04000-403720	Vale Canada Limited		\$19,607.92
04000-403800	Arnold Alicia		\$18,770.73
Special Assessments (Section 26)			
Snider Rd	City of Port Colborne - 26.4m		\$3,989.05
	Total - Special Assessments (Section 26)		\$3,989.05
			\$290,562.54

5.4.7 Interval 4: BRIP (Bank Restoration Improvement Program) STA 0+133 to 0+196

This targeted bank improvement program was provided as an alternative to the concrete block wall erosion protection completed in 2007. The program requires that the property owner agree to the proposed works prior to commencement based on the proposed assessment. Other properties can be included on the same basis. This program uses a combination of natural stone, natural materials and vegetation, including native shrubs and plants, to hold banks in place.

Construction of this bank is conducted in the dry by isolating flow away from the bank. This isolation requires approval by relevant authorities (NPCA, DFO) and has timing restrictions. The cost estimate is based on similar construction costs but can vary according to environmental requirements during construction.

An estimate of the cost of construction is made at \$45,156.73.

Table 7 Interval 4: BRIP Assessment Summary

Outlet Liability Assessment (Section 23)			
	Private Lands		\$34,957.03
	Road Right of Way Lands		\$4,049.33
	Total - Outlet Liability Assessment (Section 23)		\$39,006.36
Special Benefit Assessment (Section 24)			
04000-400900	MacNeil Robert Joseph F		\$6,150.37
04000-404320	Nieuwland Kevin		\$0
04000-404200	Mitchell Timothy J		\$0
04000-404300	Nieuwland Kevin		\$0
	Total - Special Benefit Assessment (Section 24)		\$6,150.37
			\$45,156.73

5.4.8 Interval 5: Wignell Drain Spot Maintenance STA 0+000 to 2+450

The work is for select drainage channel maintenance efforts, grade confirmation and bank improvements, including vegetation removal and/or trimming. This is a basic maintenance allocation in the estimated construction cost of \$124,865.30. This work is assessed as an upstream benefit to the watershed identified by Interval 5.

Table 8 Interval 5: Spot Maintenance Assessment Summary

Outlet Liability Assessment (Section 23)		
Private Lands	\$110,927.77	
Road Right of Way Lands	\$13,937.53	
Total - Outlet Liability Assessment (Section 23)		\$124,865.30
		\$124,865.30

This is an estimate only; actual spot maintenance costs will be assessed to the watershed.

5.4.9 Interval 6: Wignell Gate Structure Improvement and Outlet Maintenance Program

Improvements are planned for the Wignell Gate Structure. The costs for these improvements will be assessed as Maintenance using Section 23 Outlet Benefit / Outlet Liability and a runoff ratio for upstream property watershed contributors.

The improvement program is estimated to have a construction (materials and installation) cost of \$330,319.00 with a total drain cost of \$465,433.31. It will ensure that the gates continue to provide service for another 25 to 50 years. This work program aims to improve the existing infrastructure instead of replacing the infrastructure. There is an identified need to repair the Lakeshore Rd E crossing based on the 2019 OSIM inspection. The future bridge replacement could impact the gate structure when replaced. At this time, no coordination of replacement is identified. The proposed gate renewal program consists of the following primary tasks and maintenance work.

- Replacement of existing manual motors to raise and lower gates with actuators to enable remote and automatic operation of the gates.
- The two existing gates in the channel do not seal against the drain bottom, which is rock. Extending the gate bottoms by 200mm and creating a concrete sill with a notch will ensure the gates close and seal against lake-based seiche flows moving upstream.
- The existing west gate in front of the pump wet well does not extend to the same height as the other two gates. This proposed improvement shall ensure the three gates will close and protect to the height of 176.5m. An extension will be added to Gate 3 to match Gates 1 & 2.
- The existing steel superstructure and handrails with steps on the east side will be replaced with a new catwalk on top of the existing concrete structure, including an access ramp on the west side. The new catwalk and handrail will provide support to the proposed sensors. The existing PVC conduit will be reused for gate actuator controls and sensor wiring.

- The existing cabinet will be replaced with an approved NEMA-rated cabinet to house gate controls and electrical feed connections and installed on a concrete pad such that the bottom of the cabinet is above the predicted flood level of 177.3m.

This work includes allowances for land taken in favour of an access right to maintain the existing outlet. A 3m reserve across two properties is recognized and shown on the Wignell Outlet Drawing W.P6. This reserve is being implemented at the owner's request, Mr. White, Roll No. 271104000400500.

These costs will be distributed using the runoff ratio method, including contributing areas from the Michener Drain, the Port Colborne Drain and the Wignell Drain, all in their entirety.

The cost of pumping is not included in these assessments. Two proposals for pumping are addressed in this report. On an as requested basis, the City will deploy a trailer mounted pump to the Wignell ramp facility and the cost of that deployment will be assessed to the upstream landowners who request pumping on an as needed when needed basis.

Restoring pumping with a retrofit of the existing pumping station or a new pumping station can proceed where 50% of the landowners representing 60% of the land area agree to the total estimate as identified in a prepared Preliminary Design Report for City consideration at a later date. The restoration of a permanent pumping station to meet current requirements is estimated at \$450,000. This is a rough estimate only without any pre-qualifying scope of requirements.

Alternatively, where any individual or collection of landowners agree through petition to pay the estimated Total Capital cost of pumping station reinstatement along with the ongoing operating costs (similar to the previous pumping station practice), then a new pumping station can be considered, financed and constructed as part of the Drainage Act as a Schedule 78 improvement assessed to those owners requesting pumping.

Table 9 Interval 6: Wignell Gate Structure Improvements Assessment Summary

Outlet Liability Assessment (Section 23)			
	Private Lands	\$622,420.55	
	Road Right of Way Lands	\$67,484.92	
	Total Benefits Assessed:		\$689,905.47

5.5 Allowance and Assessment Schedules

Additional details on the Assessment calculations including MS Excel tables are included in Appendix B.

5.5.1 Wignell Drain Construction Assessment Schedules

The improvement of the Wignell Drain using Section 78 is to make specific changes in the drain and assign the cost for the same using an updated schedule and to achieve enhanced stormwater management functions.

The assessment tables show the resulting assessment schedules for the past construction works and the proposed construction works based on the calculations performed. They

are included in Appendix B. Past costs are presented by summary reports in Appendix C.

5.5.2 Wignell Drain Maintenance Schedules

The future maintenance assessment tables show the cost sharing schedules for future works completed as maintenance as detailed in the Drainage Act of Ontario and based on the calculations performed and included in Appendix B.

Wignell Municipal Drain
City of Port Colborne
Regional Municipality of Niagara
Section 22: Assessed Benefit
Section 23 Outlet Benefit / Outlet Liability
Section 24 Special Benefit

Owner	Legal Text	Roll No	Drain Area,		Assessment			Total	Allowance	Net
			Ha	QRF Ratio	Benefit	Outlet Liability	Special			
City of Port Colborne - Lands Assessed										
	Sollbach Katherine Jestina	HUMBERSTONE CON 1 PT LOT 23	2711-020-007-00800	0.220	0.00011		\$129	\$129	\$129	
	Lee Christopher Bernard	HUMBERSTONE CON 1 PT LOT 23 AND PT WATER LOT	2711-020-007-00900	0.110	0.00006		\$65	\$65	\$65	
	Hipfner Layton	CON 1 PT LOT 23	2711-020-007-01300	0.509	0.00026		\$300	\$300	\$300	
	Vale Canada Limited	HUMBERSTONE CON 1 PT LOTS 24 TO 26 PT WATER LOT PT RD ALLOW PLAN 849 LOTS 1 TO 4 W DAVIS ST AND E MITCHELL ST LOTS 6 AND 7 N LAKE ST PT PARK LOTS 1 TO 5 S DURHAM ST	2711-020-007-18000	0.080	0.00004		\$44	\$44	\$44	
	Vale Canada Limited	HUMBERSTONE CON 1 PT LOTS 24 TO 26 PT WATER LOT PT RD ALLOW PLAN 849 LOTS 1 TO 4 W DAVIS ST AND E MITCHELL ST LOTS 6 AND 7 N LAKE ST PT PARK LOTS 1 TO 5 S DURHAM ST	2711-020-007-18000	1.735	0.00131		\$930	\$930	\$930	
	Port Wilder Land Inc	CON 1 PT LOT 23	2711-020-007-18201	2.598	0.00557		\$6,503	\$6,503	\$6,503	
	Vale Canada Limited	CON 1 PT TWP LOT 23	2711-020-007-18300	0.186	0.00014		\$164	\$164	\$164	
	PC City Hall	CON 1 PT TWP LOT 23	2711-020-007-18400	0.334	0.00025		\$295	\$295	\$295	
	Vale Canada Limited	CON 1 PT TWP LOT 23	2711-020-007-18500	0.374	0.00028		\$330	\$330	\$330	
	Vale Canada Limited	CON 1 PT TWP LOT 23	2711-020-007-18600	0.372	0.00028		\$328	\$328	\$328	
	Vale Canada Limited	CON 1 PT TWP LOT 23	2711-020-007-18700	0.186	0.00014		\$164	\$164	\$164	
	Vale Canada Limited	HUMBERSTONE CON 1 PT LOT 23	2711-020-007-18800	1.648	0.00125		\$1,455	\$1,455	\$1,455	
	Vale Canada Limited	CON 1 PT TWP LOT 23 RP 59R10985 PART 1	2711-020-007-18900	2.229	0.00169		\$1,969	\$1,969	\$1,969	
	McLean William Richard Samue	CON 1 PT TWP LOT 23	2711-020-013-11300	0.095	0.00006		\$70	\$70	\$70	
	Ferri Vincent	CON 1 PT TWP LOT 23	2711-020-013-11400	0.191	0.00012		\$140	\$140	\$140	
	Scott Gregory George	CON 1 PT TWP LOT 23	2711-020-013-11500	0.190	0.00012		\$140	\$140	\$140	
	Elite Cap PC Holdings Inc	CON 2 PT LOT 24	2711-020-013-12000	0.534	0.00047		\$550	\$550	\$550	
	F Jarry Terry Alain	CON 2 PT LOT 17	2711-040-003-08000	4.073	0.00360		\$5,966	\$5,966	\$5,966	
	Mackay Graham	CON 2 PT LOT 17	2711-040-003-08100	4.068	0.00359		\$5,960	\$5,960	\$5,960	
	F Bury Alexander	CON 2 PT LOT 17	2711-040-003-08101	4.073	0.00360		\$5,966	\$5,966	\$5,966	
	F Ruston Earl John	CON 2 PT LOT 17	2711-040-003-08200	1.597	0.00141		\$2,339	\$2,339	\$2,339	
	Fehrman Paul Allan	HUMBERSTONE CON 2 PT LOT 17	2711-040-003-08201	5.595	0.00494		\$8,196	\$8,196	\$8,196	
	F Fehrman Mark David	HUMBERSTONE CON 2 PT LOT 17 RP 59R15085 PART 1	2711-040-003-08203	0.256	0.00016		\$268	\$268	\$268	
	F 1970065 Ontario Inc	CON 2 PT LOT 17	2711-040-003-08300	6.417	0.00842		\$13,965	\$13,965	\$13,965	
	F Li Yue	CON 2 PT LOT 17	2711-040-003-08400	2.706	0.00239		\$3,965	\$3,965	\$3,965	
	F Noel Marc Raymond	CON 2 PT LOT 17	2711-040-003-08401	2.679	0.00237		\$3,925	\$3,925	\$3,925	
	Fabi David George	CON 2 PT LOT 17	2711-040-003-08500	4.033	0.00356		\$5,908	\$5,908	\$5,908	
	Vince Terrance Andrew	CON 2 PT LOT 17RP 59R13523 PART 1	2711-040-003-08600	0.562	0.00035		\$588	\$588	\$588	
	F Vince Terrance Andrew	CON 2 PT LOT 17	2711-040-003-08601	0.175	0.00011		\$183	\$183	\$183	
	F Bowman Douglas Murray	CON 2 PT LOT 17	2711-040-003-08700	15.520	0.01371		\$22,735	\$22,735	\$22,735	
	F Cooper Morgan Katherine	CON 1 PT LOT 18	2711-040-003-10200	2.153	0.00190		\$3,154	\$3,154	\$3,154	
	F Ladd Sharon Lynn	CON 2 PT LOT 19	2711-040-003-10201	8.234	0.00727		\$12,062	\$12,062	\$12,062	
	F Bankert David Roy	CON 1 PT LOT 18	2711-040-003-10300	5.311	0.00469		\$7,780	\$7,780	\$7,780	
	Port Colborne Quarries Inc	CON 2 PT LOT 18	2711-040-003-11200	19.989	0.01765	\$1,425	\$29,282	\$167,465	\$198,172	
	F Bonin Emma Sylvia	CON 2 PT LOT 18	2711-040-003-11201	1.677	0.00106		\$1,755	\$1,755	\$1,755	
	Ruston James Daryl	CON 2 PT LOT 18	2711-040-003-11202	2.254	0.00199		\$3,301	\$3,301	\$3,301	
	Rankin Engineering Inc	HUMBERSTONE CON 2 PT LOT 18 AND RP 59R3391 PT PART 1	2711-040-003-11300	10.331	0.00912		\$15,135	\$15,135	\$14,019	
	F Van Boom Maria	CON 2 PT LOT 18	2711-040-003-11400	0.622	0.00039		\$651	\$651	\$651	
	Fehrman John Paul	HUMBERSTONE CON 2 PT LOT 18 AND RP 59R9411 PART 3	2711-040-003-11500	14.086	0.01244		\$20,634	\$18,021	\$38,655	
	Jacques Timothy Maurice	CON 2 PT LOT 18 RP 59R9411 PART 1	2711-040-003-11600	0.408	0.00026		\$427	\$427	\$427	
	Bankert Ralph Edward	CON 2 PT LOT 18 RP 59R9411 PART 2 PART 4	2711-040-003-11700	0.074	0.00005		\$77	\$77	\$77	
	Leaman Carol Christine	CON 2 PT LOT 19	2711-040-003-12100	0.125	0.00008		\$131	\$131	\$131	
	Seredine Michael Nicholas	CON 2 PT LOT 19	2711-040-003-12200	0.075	0.00005		\$79	\$79	\$79	
	Hobbs Edward George	CON 2 PT LOT 19	2711-040-003-12300	0.167	0.00011		\$175	\$175	\$175	
	Wright Timothy James	CON 2 PT LOT 19	2711-040-003-12400	0.576	0.00036		\$602	\$602	\$602	
	Shave Harry Albert	CON 2 PT LOT 19	2711-040-003-12500	0.400	0.00025		\$419	\$419	\$419	
	Van Schaik Thomas Albert	CON 2 PT LOT 19	2711-040-003-12600	0.405	0.00026		\$424	\$424	\$424	
	1000149971 Ontario Corporation	CON 2 PT LOT 19	2711-040-003-12700	1.284	0.00081		\$1,343	\$1,343	\$1,343	
	Butters Larry R	CON 2 PT LOT 19	2711-040-003-12800	0.235	0.00015		\$246	\$246	\$246	
	Landry Rita	CON 2 PT LOT 19	2711-040-003-12900	0.161	0.00010		\$168	\$168	\$168	
	Doolittle Douglas Burkin	PLAN 19 LOT 23 LOT 24 NP778	2711-040-003-14300	0.071	0.00004		\$25	\$25	\$25	
	F Leblanc Marc	PLAN 19 PT LOT 25 PT LOT 26 NP778	2711-040-003-14500	0.289	0.00015		\$101	\$101	\$101	
	F Pye Laurie Lynne	CON 1 PT LOT 19 PT LOT 20	2711-040-003-14600	12.370	0.01092		\$7,541	\$7,541	\$7,541	
	Bankert David Roy	CON 1 PT LOT 19 RP 59R12136 PARTS 1 AND 2	2711-040-003-14700	3.938	0.00348		\$2,401	\$2,401	\$2,401	
	F Little Lisa Marie	CON 1 PT LOT 19 RP 59R1775 PART 1	2711-040-003-14900	2.690	0.00238		\$3,940	\$3,940	\$3,940	
	Vandebeld Grace Elizabeth	CON 1 PT LOT 19 PT LOT 20	2711-040-003-15000	22.944	0.02026		\$29,199	\$29,199	\$29,199	
	Hennigar Vernon Charles	HUMBERSTONE CON 2 PT LOT 19 AND RP 59R14613 PART 1	2711-040-003-15100	0.695	0.00044		\$727	\$727	\$727	
	F Crawford David Emerson T	HUMBERSTONE CON 2 PT LOT 19 RP 59R17241 PART 1	2711-040-003-15101	1.655	0.00104		\$1,732	\$1,732	\$1,732	
	Ladd Sharon Lynn	CON 2 PT LOT 19	2711-040-003-15102	2.498	0.00221		\$3,659	\$3,659	\$3,659	
	Ladd Kevin Wilfred	CON 2 PT LOT 19	2711-040-003-15200	0.370	0.00028		\$464	\$464	\$464	
	F Fehrhaven Farms Inc	HUMBERSTONE CON 2 PT LOT 19 RP 59R17241 PARTS 2 AND 3	2711-040-003-15300	0.067	0.00005		\$84	\$84	\$84	
	1970065 Ontario Inc	AND RP 59R16702 PARTS 1 AND 2	2711-040-003-15305	59.561	0.05260		\$87,251	\$87,251	\$87,251	
	Rankin Engineering Inc	CON 2 PT LOT 19	2711-040-003-15400	3.802	0.00240		\$3,978	\$3,978	\$3,978	
	2053048 Ontario Inc	CON 2 PT LOT 19	2711-040-003-15500	2.189	0.00138		\$2,290	\$2,290	\$2,290	
	F Port Colborne Quarries Inc	HUMBERSTONE CON 2 PT LOTS 19 AND 20 RP 59R8010 PT PART 2	2711-040-003-15600	70.006	0.06182		\$73,847	\$73,847	\$73,847	
	Fehrman Paul Allan	HUMBERSTONE CON 2 PT LOT 20 RP 59R8342 PT PART 1	2711-040-003-15700	29.095	0.02570		\$42,617	\$42,617	\$42,617	
	Phillips Richard Gordon	CON 2 PT LOT 20 RP 59R-1546 PARTS 1, 2, 3	2711-040-003-15702	1.355	0.00085		\$1,390	\$1,390	\$1,390	
	Walker William Shawn Robert	HUMBERSTONE CON 2 PT LOT 20 RP 59R15509 PART 1	2711-040-003-15705	0.944	0.00060		\$988	\$988	\$988	
	Watson Carol Ann	CON 2 PT LOT 20	2711-040-003-15900	0.373	0.00024		\$390	\$390	\$390	
	Brodeur Christa Nicole	CON 2 PT LOT 20	2711-040-003-16000	0.125	0.00008		\$130	\$130	\$130	
	Lee Derek	CON 2 PT LOT 20	2711-040-003-16100	0.344	0.00022		\$360	\$360	\$360	
	Shibley Chad William	CON 2 PT LOT 19	2711-040-003-16200	0.254	0.00016		\$265	\$265	\$265	
	Interisano Tyler John	CON 2 PT LOT 19 RP 59R2896 PART 1	2711-040-003-16300	3.086	0.00272		\$4,520	\$4,520	\$4,520	
	F Long Mark Christopher	CON 2 PT LOT 19	2711-040-003-16400	0.453	0.00029		\$474	\$474	\$474	
	Harrington Peter Anthony	CON 2 PT LOT 19	2711-040-003-16500	4.891	0.00432		\$7,164	\$7,164	\$7,164	
	Burke Michael	CON 2 PT LOT 19 RP 59R12723 PART 1	2711-040-003-16600	0.174	0.00011		\$182	\$182	\$182	
	Burke Michael	CON 2 PT LOT 19	2711-040-003-16700	0.220	0.00014		\$230	\$230	\$230	
	Phillips Charles Milton	CON 2 PT LOT 19 PLAN 59R 7048 PART 1	2711-040-003-16800	0.119	0.00008		\$125	\$125	\$125	
	Reles David Leonard	CON 2 PT LOT 19	2711-040-003-16900	0.242	0.00015		\$253	\$253	\$253	
	King Carl Rodney	CON 2 PT LOT 19	2711-040-003-17000	0.198	0.00013		\$208	\$208	\$208	
	Arsenault Henri Claude	CON 2 PT LOT 19	2711-040-003-17100	0.210	0.00013		\$220	\$220	\$220	
	Gillespie Evan John	CON 2 PT LOT 19 RP 59R10597 PART 1	2711-040-003-17200	0.221	0.00014		\$231	\$231	\$231	
	Smith Reginald Garfield	CON 2 PT LOT 19	2711-040-003-17400	0.150	0.00009		\$157	\$157	\$157	
	Pagliaro Carlo	CON 1 PT LOT 20	2711-040-003-17501	0.652	0.00041		\$682	\$682	\$682	
	F Ribau Jeffrey	CON 1 PT LOT 20	2711-040-003-17600	0.908	0.00057		\$950	\$950	\$950	
	F Bankert Roy Wallace	CON 1 PT LOT 20	2711-040-003-17700	2.308	0.00146		\$2,415	\$2,415	\$2,415	
	Bankert Helen Irene	CON 1 PT LOT 20	2711-040-003-17710	5.230	0.00462		\$7,662	\$7,662	\$7,662	
	Quesselle Andrew Todd	CON 1 PT LOT 20 PLAN 59R 9375 PARTS 2 & 3	2711-040-003-17800	0.617	0.00039		\$645	\$645	\$645	
	Clow Kevin	CON 1 PT LOT 20	2711-040-003-17825	3.692	0.00233		\$2,202	\$2,202	\$2,202	
	F Grist William Joseph	CON 1 PT LOT 20 RP59R 11429 PART 1	2711-040-003-17850	0.406	0.00026		\$177	\$177	\$177	
	Van Kralingen Allert	CON 1 PT LOT 20	2711-040-003-17900	17.360	0.01533		\$10,584	\$10,584	\$10,584	
	Nero Felice	CON 1 PT LOT 20	2711-040-003-18000	2.431	0.00215		\$1,482	\$1,482	\$1,482	

Owner	Legal Text	Roll No	Drain Area, Ha	QRF Ratio	Benefit	Assessment			Total	Allowance	Net
						Outlet Liability	Special				
Whisky Run Golf Club Ltd	CON 1 PT LOT 20	2711-040-003-18010	5.105	0.00451		\$3,113			\$3,113	\$3,113	
Nieuwland Liewue Cornelis	CON 1 PT LOT 20 RP 59R5493 PART 1	2711-040-003-18100	0.560	0.00028		\$195			\$195	\$195	
O'Hara Gregory G	CON 1 PT LOT 21 PT WATER LOT RP 59R5808 PART 3	2711-040-004-00100	0.357	0.00018		\$124			\$124	\$124	
Leon Lou Ann M	HUMBERSTONE CON 1 PT LOT 21 PT WATER LOT AND RP 59R5808 PT PART 2	2711-040-004-00101	0.889	0.00045		\$310			\$310	\$310	
Weebadurachchige Asela	CON 1 PT LOT 21 PT WATER LOT RP 59R5808 PART 1	2711-040-004-00102	0.513	0.00026		\$179			\$179	\$179	
Neumann Gary	CON 1 PT LOT 21	2711-040-004-00300	0.385	0.00019		\$134			\$134	\$134	
Frame John Douglas	HUMBERSTONE CON 1 PT LOT 21 PT WATER LOT RP 59R9880 PARTS 1 AND 2	2711-040-004-00305	0.553	0.00028		\$96			\$96	\$588	
Matheson Gary	CON 1 PT LOT 21	2711-040-004-00400	0.414	0.00021		\$144			\$144	\$144	
White Stephen Christopher	CON 1 PT LOT 21 RP59R 9880 PART 3	2711-040-004-00500	1.150	0.00058		\$200			\$200	\$1,201	
McKay Terence	CON 1 PT LOT 21 PT WATER LOT RP 59R5181 PART 1 PART 2	2711-040-004-00505	0.753	0.00038		\$131			\$131	\$131	
Stivoric Joseph Michael	CON 1 PT LOT 21 RP 59R9381 PARTS 8 TO 12	2711-040-004-00510	0.058	0.00003		\$20			\$20	\$20	
Singh Anthony	CON 1 PT LOT 21 RP 59R12934 PART 1 RP 59R13445 PART 1	2711-040-004-00620	0.113	0.00006		\$40			\$40	\$40	
Bowman Patricia May	CON 1 PT LOT 22 PT WATER LOT	2711-040-004-00700	0.156	0.00008		\$54			\$54	\$54	
Cunningham Jesse	CON 1 PT LOT 22	2711-040-004-00800	0.061	0.00003		\$21			\$21	\$21	
Pelchat Brock	CON 1 PT LOT 22	2711-040-004-00820	0.033	0.00002		\$12			\$12	\$12	
MacNeil Robert Joseph F	CON 1 PT LOT 22	2711-040-004-00900	0.400	0.00020		\$177	\$6,150		\$6,328	\$6,328	
Anthony Thomas	CON 1 PT LOT 22	2711-040-004-01000	0.015	0.00001		\$5			\$5	\$5	
Cudmore Blair	CON 1 PT LOT 22	2711-040-004-01100	0.055	0.00003		\$19			\$19	\$19	
Taliano David	CON 1 PT LOT 22	2711-040-004-01200	0.099	0.00005		\$35			\$35	\$35	
Zahn Jeffrey Bard	CON 1 PT LOT 22 PT WATER LOT 59R3741 PART 2 59R4853 PART 1	2711-040-004-01300	0.115	0.00006		\$40			\$40	\$40	
Colling Candace Nadine	PT WATER LOT 59R3741 PART 1	2711-040-004-01301	0.088	0.00004		\$31			\$31	\$31	
Dietrich Law Firm PC	CON 1 PT LOT 22 RP59R4853 PART 2	2711-040-004-01400	0.081	0.00004		\$28			\$28	\$28	
Cassan James Cameron Gregory	CON 1 PT LOT 22	2711-040-004-01500	0.096	0.00005		\$34			\$34	\$34	
Hall Valerie	CON 1 PT LOT 22	2711-040-004-01700	0.248	0.00013		\$87			\$87	\$87	
McKeil Blair Daniel	CON 1 PT LOT 23 RP 59R3304 PART 1	2711-040-004-01800	0.490	0.00025		\$288			\$288	\$288	
Gabriele Janice Ann	CON 1 PT LOT 23	2711-040-004-02100	0.282	0.00014		\$166			\$166	\$166	
Peacock Kent William	CON 1 PT LOT 23	2711-040-004-02300	0.294	0.00015		\$173			\$173	\$173	
Moscrip Pearl Hope	CON 1 PT LOT 23 AND PT WATER LOT	2711-040-004-02400	0.073	0.00004		\$43			\$43	\$43	
Peppas Apostolos Paul	CON 1 PT LOT 23 AND PT WATER LOT	2711-040-004-02500	0.144	0.00007		\$85			\$85	\$85	
Nagle Gary Patrick	CON 1 PT LOT 23 AND PT WATER LOT	2711-040-004-02600	0.148	0.00007		\$87			\$87	\$87	
Scarlett Rebecca Ann	CON 1 PT LOT 23 AND PT WATER LOT	2711-040-004-02700	0.133	0.00007		\$78			\$78	\$78	
Papadakis Patricia	CON 1 PT LOT 23	2711-040-004-02801	0.138	0.00007		\$81			\$81	\$81	
Coury Corinne	CON 1 PT LOT 23 PT WATER LOT RP59R3560 PART 2	2711-040-004-02900	0.124	0.00006		\$73			\$73	\$73	
Duffy John	CON 1 PT LOT 23 RP 59R10985 PART 3	2711-040-004-02901	0.430	0.00022		\$253			\$253	\$253	
Maloney John David	CON 1 PT LOT 23 PT WATER LOT RP59R3560 PART 1	2711-040-004-02902	0.119	0.00006		\$70			\$70	\$70	
Pruyn Francis M R	CON 1 PT LOT 23 RP 59R10985 PART 2	2711-040-004-02905	0.570	0.00029		\$336			\$336	\$336	
McQuilkin Vanessa	CON 1 PT LOT 23	2711-040-004-03000	0.277	0.00014		\$163			\$163	\$163	
Vale Canada Limited	HUMBERSTONE CON 1 PT LOT 23	2711-040-004-03100	0.064	0.00003		\$38			\$38	\$38	
Siba Jayne Leslie	CON 1 PT LOT 23	2711-040-004-03200	0.276	0.00014		\$163			\$163	\$163	
Peshimam Abid Zahoor	CON 1 PT LOT 23	2711-040-004-03300	0.238	0.00012		\$140			\$140	\$140	
Dutcher Lori	CON 1 PT LOT 23	2711-040-004-03400	0.236	0.00012		\$139			\$139	\$139	
Soldat Lesley	CON 1 PT LOT 23	2711-040-004-03500	0.233	0.00012		\$137			\$137	\$137	
Lawson Snider	CON 1 PT LOT 23 RP59R7556 PART 1	2711-040-004-03600	0.408	0.00021		\$240			\$240	\$240	
Ramautarsingh Lindsey D	CON 1 PT LOT 23 PLAN 59R7556 PART 2 3 4	2711-040-004-03605	0.407	0.00021		\$240			\$240	\$240	
Vale Canada Limited	HUMBERSTONE CON 1 PT LOT 23	2711-040-004-03700	7.780	0.00589		\$6,872			\$6,872	\$6,872	
Vale Canada Limited	HUMBERSTONE CON 1 PT LOT 22	2711-040-004-03710	1.715	0.00130		\$1,515			\$1,515	\$1,515	
Vale Canada Limited	HUMBERSTONE CON 1 PT LOT 22	2711-040-004-03720	6.459	0.00489		\$4,825	\$20,143		\$24,969	\$24,969	
Arnold Alicia	CON 1 PT LOT 22	2711-040-004-03800	0.380	0.00019		\$224	\$19,283		\$19,507	\$19,507	
Snider Harvey Wilson	CON 1 PT LOT 22	2711-040-004-03900	0.264	0.00013		\$117			\$117	\$117	
Roman Catholic Episcopal Corporat	CON 1 PT LOT 22	2711-040-004-04100	2.601	0.00295		\$2,592			\$2,592	\$2,592	
Mitchell Timothy J	CON 1 PT LOT 22	2711-040-004-04200	1.150	0.00058		\$509			\$509	\$509	
Nieuwland Kevin	HUMBERSTONE CON 1 PT LOT 22 RP 59R13926A PART 4	2711-040-004-04300	3.815	0.00289		\$2,535			\$2,535	\$2,535	
570466 Ontario Limited	CON 1 PT LOT 21	2711-040-004-04301	5.117	0.00452		\$3,173			\$3,173	\$3,173	
Mason Martha Jeanne	CON 1 PT LOT 21	2711-040-004-04303	3.068	0.00232		\$1,603			\$1,603	\$1,603	
Nieuwland Kevin	HUMBERSTONE CON 1 PT LOT 22 RP 59R13926A PARTS 1 TO 3	2711-040-004-04320	0.445	0.00022		\$197			\$197	\$197	
Gibbs Irene	CON 1 PT LOT 21	2711-040-004-04400	0.442	0.00028		\$192			\$192	\$192	
Nicholls Larry James	CON 1 PT LOT 21	2711-040-004-04500	1.220	0.00077		\$531			\$531	\$531	
Winger Lloyd James Junior	CON 1 PT LOT 21	2711-040-004-04600	0.849	0.00054		\$370			\$370	\$370	
Martin James Alan	CON 1 PT LOT 21 PLAN 59R6790 PART 1	2711-040-004-04601	0.405	0.00026		\$176			\$176	\$176	
F Whisky Run Golf Club Ltd	CON 1 PT LOT 21 PT LOT 22 RP 59R8112 PART 1	2711-040-004-04700	18.777	0.01658		\$11,453			\$11,453	\$11,453	
F Bankert David Roy	HUMBERSTONE CON 1 PT LOT 21	2711-040-004-04800	13.855	0.01224		\$10,557			\$10,557	\$10,557	
F Spiteri Claudia Maria	HUMBERSTONE CON 1 PT LOT 21 RP 59R17058 PART 1	2711-040-004-04802	0.681	0.00043		\$297			\$297	\$297	
Talbot Jason J	CON 1 PT LOT 21	2711-040-004-04900	0.316	0.00020		\$138			\$138	\$138	
Vale Canada Limited	CON 1 PT LOT 21 RP 59R9448 PART 1	2711-040-004-05000	0.348	0.00022		\$151			\$151	\$151	
Vale Canada Limited	CON 1 PT LOT 21 PT LOT 22	2711-040-004-05100	15.399	0.01360		\$11,574			\$11,574	\$11,574	
Vale Canada Limited	CON 1 PT LOT 21	2711-040-004-05200	7.941	0.00701		\$4,913			\$4,913	\$4,913	
Arsenault Robert Eugene	CON 1 PT LOT 21	2711-040-004-05300	0.236	0.00015		\$103			\$103	\$103	
Perron Alysha Marie	CON 1 PT LOT 21	2711-040-004-05400	0.340	0.00021		\$148			\$148	\$148	
Peterson Chad Allan	CON 1 PT LOT 21	2711-040-004-05500	9.486	0.00838		\$5,915			\$5,915	\$5,915	
Kriter Robert	HUMBERSTONE CON 1 PT LOT 21 AND 22 RP 59R10301 PART 2	2711-040-004-05600	3.069	0.00271		\$2,730			\$2,730	\$2,730	
F Paxton Matthew Ryan	HUMBERSTONE CON 1 PT LOT 21 AND 22 RP 59R10301 PART 6	2711-040-004-05602	3.050	0.00269		\$2,179			\$2,179	\$2,179	
Moskalyk John Joseph	CON 1 PT LOT 21	2711-040-004-05700	6.809	0.00601		\$8,032			\$8,032	\$8,032	
Pace Christopher Alan	CON 1 PT LOT 21	2711-040-004-05800	1.795	0.00113		\$1,878	\$976		\$902	\$902	
Bodorkos Brian	CON 1 PT LOT 21 RP 59R9110 PT 1	2711-040-004-05900	0.151	0.00010		\$158			\$158	\$158	
Besselink Leo	CON 1 PT LOT 21	2711-040-004-06000	0.332	0.00021		\$347			\$347	\$347	
Vanderhoeck James Anthony	CON 1 PT LOT 21	2711-040-004-06100	0.335	0.00021		\$350			\$350	\$350	
Sieber Michael Joseph	CON 1 PT LOT 21	2711-040-004-06200	0.366	0.00023		\$383			\$383	\$383	
Thalen William Douglas	CON 1 PT LOT 21	2711-040-004-06300	0.511	0.00032		\$534			\$534	\$534	
Fahay Kevin Thomas	CON 1 PT LOT 21 RP 59R14550 PART 1	2711-040-004-06400	0.416	0.00026		\$435			\$435	\$435	
Lagace Raymond Yvon	CON 1 PT LOT 21 RP 59R4325 PART 1	2711-040-004-06500	0.416	0.00026		\$435			\$435	\$435	
Devries Susan Joanna	CON 1 PT LOT 21 RP 59R13702 PART 1	2711-040-004-06600	0.416	0.00026		\$435			\$435	\$435	
Iovio Gregory Simon	CON 1 PT LOT 21 RP 59R13702 PART 2	2711-040-004-06700	0.416	0.00026		\$435			\$435	\$435	
Riegler Colleen	CON 1 PT LOT 21	2711-040-004-06800	0.415	0.00026		\$434			\$434	\$434	
Bertulli David Raymond	CON 1 PT LOT 21	2711-040-004-06900	0.399	0.00025		\$418			\$418	\$418	
Pare Robert Laurent	CON 1 PT LOT 21	2711-040-004-07000	0.747	0.00047		\$782			\$782	\$782	
F Dunham Traci Lynn	CON 1 PT LOT 21	2711-040-004-07100	0.111	0.00007		\$116			\$116	\$116	
F Bearss Douglas John	CON 1 PT LOT 21 PT LOT 22	2711-040-004-07200	5.650	0.00499		\$8,276			\$8,276	\$8,276	
F White Margaret Ann	CON 1 PT LOT 22	2711-040-004-07300	9.076	0.00802		\$11,589			\$11,589	\$11,589	
White Margaret Ann	CON 1 PT LOT 22	2711-040-004-07300	5.226	0.00462		\$9,242			\$9,242	\$9,242	
Johnson David Allen	CON 1 PT LOT 22	2711-040-004-07400	0.345	0.00022		\$361			\$361	\$361	
Hassam Kirsten Anne	CON 1 PT LOT 22	2711-040-004-07500	0.464	0.00029		\$485			\$485	\$485	
Rittner Robert	CON 1 PT LOT 22	2711-040-004-07600	0.349	0.00022		\$366			\$366	\$366	
Pipher Eric James	CON 1 PT LOT 22	2711-040-004-07700	0.149	0.00009		\$156			\$156	\$156	
Elite Cap PC Holdings Inc	CON 1 PT LOT 22 RP59R3591 PART 1	2711-040-004-07800	7.680	0.00678		\$8,449			\$8,449	\$8,449	
PC City Hall	CON 1 PT LOT 22 RP 59R10										

Owner	Legal Text	Roll No	Drain Area, Ha	QRF Ratio	Benefit	Assessment			Total	Allowance	Net
						Liability	Special	Outlet			
Vale Canada Limited	CON 1 PT LOT 23 RP 59R3414 PART 5 TO 7	2711-040-004-08600	8.441	0.00639				\$7,456		\$7,456	
Schlenger Uszer	CON 1 PT LOT 23	2711-040-004-08700	6.732	0.00510			\$5,946		\$5,946		
Schlenger Uszer	CON 1 PT LOT 23	2711-040-004-08700	10.882	0.00824			\$8,115		\$8,115		
PC City Hall	CON 1 PT LOTS 23, 24 RP 59R10294 PART 1	2711-040-004-08715	2.461	0.00186			\$2,174		\$2,174		
Schlenger Uszer	CON 1 PT LOT 23	2711-040-004-08800	0.373	0.00030			\$351		\$351		
Coccagna Anthony	CON 1 PT LOT 23	2711-040-004-08900	0.631	0.00040			\$465		\$465		
1346618 Ontario Ltd	CON 1 PT LOT 23	2711-040-004-09000	0.463	0.00029			\$341		\$341		
Ostrie Milan	CON 1 PT LOT 23 RP 59R5797 PART 1	2711-040-004-09100	0.201	0.00013			\$148		\$148		
S G Red III Land Corp	CON 1 PT LOT 23 PT LOT 24	2711-040-004-09200	0.778	0.00059			\$688		\$688		
Favero Lidia	CON 1 PT LOT 23	2711-040-004-09300	0.202	0.00013			\$149		\$149		
Ed Christensen Roofing Limited	CON 1 PT LOT 23	2711-040-004-09400	0.190	0.00012			\$140		\$140		
Sauder William Edward	HUMBERSTONE CON 1 PT LOT 23	2711-040-004-09500	0.190	0.00012			\$140		\$140		
Stenson Ian John	CON 1 PT LOT 23	2711-040-004-09600	0.190	0.00012			\$140		\$140		
Polverari Giuseppe	CON 1 PT LOT 23	2711-040-004-09700	0.190	0.00012			\$140		\$140		
S G Red III Land Corp	HUMBERSTONE CON 1 PT LOTS 23 AND 24 SRO	2711-040-004-09800	5.747	0.00435			\$5,068		\$5,068		
JTL Integrated Machine Ltd	CON 1 PT LOT 23 RP 59R13636 PARTS 1 AND 2	2711-040-004-09801	2.212	0.00474			\$5,535		\$5,535		
Vale Canada Limited	CON 1 PT LOT 23	2711-040-004-09802	3.949	0.00299			\$3,488		\$3,488		
Elite 869 Killaly Holdings Inc	CON 2 PT LOT 21	2711-040-004-09900	12.547	0.01108			\$18,380		\$18,380		
Elite Cap PC Holdings Inc	CON 2 PT LOT 21 RP 59R3588 PART 1	2711-040-004-10000	15.732	0.01389			\$20,889		\$20,889		
Sherry Vernon Eugene Martin	CON 2 PT LOT 21	2711-040-004-10100	4.047	0.00357			\$5,929		\$5,929		
Vale Canada Limited	CON 2 PT LOT 21 RP59R3588 PART 2	2711-040-004-10101	0.121	0.00008			\$127		\$127		
Baillargeon Steve	CON 2 PT LOT 21	2711-040-004-10200	0.152	0.00010			\$159		\$159		
Dennis Wayne	CON 2 PT LOT 21	2711-040-004-10300	0.182	0.00012			\$191		\$191		
Huffman John Wayne	CON 2 PT LOT 21	2711-040-004-10400	0.179	0.00011			\$166		\$166		
Young Tammy Lynn	CON 2 PT LOT 21	2711-040-004-10500	0.212	0.00013			\$189		\$189		
2867781 Ontario Inc	CON 2 PT LOT 21	2711-040-004-10600	0.197	0.00012			\$157		\$157		
Citrigno Angela	CON 2 PT LOT 21	2711-040-004-10700	0.205	0.00013			\$163		\$163		
Stark Raymond	CON 2 PT LOT 21 RP 59R4333 PART 1	2711-040-004-10705	3.954	0.00349			\$4,951		\$4,951		
Konc John Andrew	CON 2 PT LOT 22 RP 59R4801 PART 3	2711-040-004-10710	2.899	0.00256			\$2,987		\$2,987		
Van Ruven Josef Nicolaas	CON 2 PT LOT 22 RP 59R4801 PART 2	2711-040-004-10800	4.199	0.00371			\$4,327		\$4,327		
F Stewart Scott James	CON 2 PT LOT 22 RP 59R 5732 PART 1	2711-040-004-10810	0.407	0.00026			\$299		\$299		
705 Main PC Holdings Inc	CON 2 PT LOT 22 RP59R4801 PART 1	2711-040-004-10900	7.711	0.00681			\$7,947		\$7,947		
Hellinga Jack Simon	CON 2 PT LOT 22	2711-040-004-11000	5.411	0.00341			\$3,983		\$3,983		
Kinzie Patricia Helen	CON 2 PT LOT 21 RP 59R6766 PART 2	2711-040-004-11200	1.202	0.00076			\$885		\$885		
Pipher Lynn Mae	CON 2 PT LOT 21 RP 59R6766 PART 1	2711-040-004-11205	1.208	0.00076			\$889		\$889		
Scace Wesley	CON 2 PT LOT 21	2711-040-004-11300	0.067	0.00004			\$49		\$49		
Port Colborne Quarries Inc	CON 2 PT LOT 21 PT LOT 22 RP 59R8010 PART 1	2711-040-004-11500	73.171	0.06462			\$75,405		\$75,405		
Parsons David Scott	CON 2 PT LOT 22	2711-040-004-11600	0.418	0.00026			\$308		\$308		
Leavere Larry Allan Thomas	CON 2 PT LOT 22	2711-040-004-11700	0.209	0.00013			\$154		\$154		
Yanni Bill	CON 2 PT LOT 22	2711-040-004-11900	0.418	0.00026			\$308		\$308		
Fitzgerald Shawn Patrick	HUMBERSTONE CON 2 PT LOT 22	2711-040-004-12000	0.209	0.00013			\$154		\$154		
Orlowski Jeffrey	CON 2 PT LOT 22 RP 59R4884 PART 1	2711-040-004-12100	0.209	0.00013			\$154		\$154		
Moes Frank Allan	HUMBERSTONE CON 2 PT LOT 22	2711-040-004-12200	0.357	0.00023			\$263		\$263		
Boda Terry Joseph	CON 2 PT LOT 22	2711-040-004-12400	0.186	0.00012			\$137		\$137		
Elite Capital P.C Developments Inc	CON 2 PT LOT 22	2711-040-004-12600	12.732	0.01124			\$16,865		\$16,865		
Elite Cap PC Holdings Inc	CON 2 PT LOT 22 PT LOT 23	2711-040-004-12700	12.627	0.01115			\$14,087		\$14,087		
Elite Cap PC Holdings Inc	CON 2 PT LOT 22 PT LOT 23	2711-040-004-12700	22.193	0.01960			\$19,919		\$19,919		
Elite Cap PC Holdings Inc	CON 2 PT LOT 23	2711-040-004-12800	0.363	0.00028			\$321		\$321		
NCDSB	CON 2 PT LOT 23	2711-040-004-12900	5.947	0.00450			\$5,253		\$5,253		
Dyson Patrick James	CON 2 PT LOT 23	2711-040-004-13000	0.176	0.00011			\$129		\$129		
Dyson Mary Lynn	CON 2 PT LOT 23	2711-040-004-13100	0.182	0.00011			\$134		\$134		
Hortobagyi Zoltan	CON 2 PT LOT 23	2711-040-004-13200	0.186	0.00012			\$137		\$137		
Wakunick Deborah Ivy	CON 2 PT LOT 24	2711-040-004-13300	0.085	0.00005			\$63		\$63		
Wells Donna Louise	CON 2 PT LOT 23 PT LOT 24 RP59R-6141 PART 7	2711-040-004-13400	0.424	0.00027			\$312		\$312		
Elite Cap PC Holdings Inc	HUMBERSTONE CON 2 PT LOTS 23 PT LOT 24 RP 59R6141 PARTS 1 2 PT PART 3	2711-040-004-13401	7.409	0.00654			\$7,635		\$7,635		
Elite Cap PC Holdings Inc	CON 2 PT LOT 23 PT LOT 24 RP 59R6141 PT PART 6	2711-040-004-13410	9.878	0.00872			\$10,180		\$10,180		
Elite Cap PC Holdings Inc	CON 2 PT LOT 24 RP 59R10047 PARTS 1 TO 3	2711-040-004-13435	0.533	0.00047			\$549		\$549		
Port Colborne Quarries Inc	HUMBERSTONE CON 2 PT LOTS 23 AND 24 RP 59R1037 PARTS 1 TO 4 8 TO 10 RP 59R8010 PART 3	2711-040-004-14000	3.313	0.00293			\$3,415		\$3,415		
Elite Cap PC Holdings Inc	CON 2 PT LOT 24	2711-040-004-14120	0.929	0.00082			\$957		\$957		
Leon Lou Ann M	CON 1 PT LOT 21 RP 59R13013 PART 1	2711-040-004-17902	0.580	0.00029			\$202		\$202		
PC City Hall	CON 1 PT LOTS 1-22	2711-040-004-99900	1.603	0.00324			\$2,626		\$2,626		
PC City Hall	CON 1 PT LOTS 1-22	2711-040-004-99900	1.011	0.00204			\$1,801		\$1,801		
Matej Dimitrov	CON 3 PT LOT 17	2711-040-005-01700	0.665	0.00042			\$696		\$696		
Huffman Audrey Ferne	CON 3 PT LOT 17	2711-040-005-01800	1.528	0.00135			\$2,239		\$2,239		
F Larocque Lucille	CON 3 PT LOT 17	2711-040-005-02301	0.042	0.00003			\$44		\$44		
Tice George Edward	CON 3 S PT LOT 17	2711-040-005-02400	15.844	0.01399			\$23,209		\$23,209		
Larocque Yvon	CON 3 PT LOT 17	2711-040-005-02500	0.251	0.00016			\$263		\$263		
F McIntyre David John	CON 3 N PT LOT 17	2711-040-005-03100	2.845	0.00251			\$4,165		\$4,165		
Fritz Julius	CON 3 PT LOT 18	2711-040-005-04500	13.612	0.01202			\$19,932		\$19,932		
2023165 Ontario Inc	CON 3 PT LOT 18 RP 59R 4060 PART 1	2711-040-005-04505	0.673	0.00042			\$704		\$704		
F 1374894 Ontario Inc	CON 3 N PT LOT 18	2711-040-005-04700	36.379	0.03213			\$53,291		\$53,291		
Tsoukalas Harry	CON 3 S PT LOT 18	2711-040-005-04800	4.164	0.00368			\$6,101		\$6,101		
Seguin Neil Donald	HUMBERSTONE CON 3 PT LOT 19 RP 59R8914 PT PART 1	2711-040-005-05105	0.131	0.00008			\$137		\$137		
Patterson Carlee Elizabeth	CON 3 PT LOT 19 PLAN 59R 8914 PART 2	2711-040-005-05110	0.492	0.00031			\$515		\$515		
Milkovich Christopher John	CON 3 PT LOT 19 PLAN 59R 8914 PART 3	2711-040-005-05120	0.497	0.00031			\$520		\$520		
De Cicco Carmen	CON 3 PT LOT 19 PLAN 59R 8914 PART 4	2711-040-005-05130	0.503	0.00032			\$526		\$526		
Elliott Cory Lyndon	CON 3 PT LOT 19 PLAN 59R 8914 PART 5	2711-040-005-05140	0.242	0.00015			\$253		\$253		
F 2023165 Ontario Inc	CON 3 PT LOT 19 PT LOT 20	2711-040-005-06400	38.250	0.03378			\$55,475		\$55,475		
Koch Olga	CON 3 LOT 19CPT	2711-040-005-06500	0.224	0.00014			\$165		\$165		
F Kozelj Stif	CON 3 PT LOT 20	2711-040-005-06600	0.079	0.00005			\$58		\$58		
Orsetto Aldo	CON 3 PT LOT 20	2711-040-005-06700	17.062	0.01507			\$23,167		\$23,167		
Forsey Cynthia Lynn	CON 3 PT LOT 20	2711-040-005-06701	0.186	0.00012			\$194		\$194		
F Currie Michael Bruce	CON 3 PT LOT 20	2711-040-005-06702	0.085	0.00005			\$63		\$63		
Fijav David	CON 3 PT LOT 20	2711-040-005-06703	0.334	0.00021			\$245		\$245		
Levitt Corie	CON 3 PT LOT 20 PLAN 59R 8240 PART 2	2711-040-005-06710	0.211	0.00013			\$156		\$156		
F Michaud Antonio Abel	CON 3 PT LOT 20 RP 59R8240 PART 1	2711-040-005-06800	0.271	0.00017			\$199		\$199		
F Henderson David Marshall	CON 3 PT LOT 20	2711-040-005-06801	15.670	0.01384			\$18,172		\$18,172		
Babion Gail J	HUMBERSTONE CON 3 PT LOT 21	2711-040-005-06900	15.252	0.01347			\$15,717		\$15,717		
Wagner Dan Patrick	CON 3 PT LOT 21	2711-040-005-07400	3.050	0.00269			\$3,143		\$3,143		
F Stovell David Alan	CON 3 PT LOT 21 59R8535 PARTS 1 TO 3	2711-040-005-07500	1.238	0.00078			\$912		\$912		
F Sidhu Navreet	CON 3 S PT LOT 21 S PT LOT 22	2711-040-005-08100	7.613	0.00672			\$7,846		\$7,846		
Henderson Drew David	CON 3 PT LOT 22	2711-040-005-08301	1.055	0.00093			\$1,087		\$1,087		
Beaulieu George E	CON 3 E PT LOT 23	2711-040-005-08900	0.388	0.00024			\$285		\$285		
Garner Mark Edward	CON 3 PT LOT 23	2711-040-005-09100	0.346	0.00022			\$255		\$255		
Joseph Grandilli	CON 3 PT LOT 23	2711-040-005-09300	0.082	0.00005			\$61		\$61		
Stefan John	CON 3 PT LOT 23	2711-040-005-09400	0.016	0.00001			\$12		\$12		
Szegedi Zsuzsanna	CON 3 PT LOT 23 RP 59R2123 PART 1	2711-040-005-10100	0.001	0.00000			\$1		\$1		
Johnson Raymond Francis Jr	CON 3 PT LOT 23 RP 59R10549 PART 1	2711-040-005-10200	0.208	0.00013			\$153		\$153		
Vance Gregory Thomas	CON 3 PT LOT 23 RP 59R10549 PART 2	2711-040-005-10202	0.417	0.00026			\$307		\$307		
Saxon Ronald Joseph	CON 3 PT LOT 23 PLAN 59R-5754 PART 2	2711-040-005-10204	0.605	0.00038			\$445		\$445		
F Pilkey Dean Lloyd	CON 3 PT LOT 23 PLAN 59R-5754 PART 1	2711-040-									

Owner	Legal Text	Roll No	Drain Area, Ha	QRF Ratio	Benefit	Assessment			Total	Allowance	Net		
						Liability	Special						
Medvic Peter James	CON 3 PT LOT 24	2711-040-005-11600	0.356	0.00022		\$262			\$262		\$262		
McIntyre Shelly	CON 3 PT LOT 24	2711-040-005-11700	0.191	0.00012		\$141			\$141		\$141		
PC City Hall	59R11176 PART 1 59R11176 PARTS 1 TO 7 59R11178 PARTS 1 TO 8 59R11179 PARTS 1 TO 4 59R11180 PARTS 2 4 AND 5	2711-040-006-99500	0.815	0.00165		\$1,920			\$1,920		\$1,920		
						1046.533	0.9022	\$1,425	\$1,193,612	\$231,064	\$1,426,101	\$3,880	\$1,422,221

Roads

Owner	ROW description	Area											
City of Port Colborne	Carl Rd From Second Concession Rd To Chippawa Rd	2.4131	0.00518	\$0	\$8,585	\$0	\$8,585						
City of Port Colborne	Second Concession Rd From Carl Rd To Miller Rd	1.6731	0.00359	\$0	\$5,952	\$0	\$5,952						
City of Port Colborne	Snider Rd From Second Concession Rd To Chippawa Rd	0.0715	0.00015	\$0	\$179	\$0	\$179						
City of Port Colborne	Chippawa Rd From Snider rd To Babion Rd	0.1328	0.00028	\$0	\$332	\$0	\$332						
City of Port Colborne	Babion Rd From Second Concession Rd To Chippawa Rd	1.4336	0.00307	\$0	\$3,588	\$0	\$3,588						
City of Port Colborne	Chippawa Rd From Babion Rd To Carl rd	0.5891	0.00126	\$0	\$1,474	\$0	\$1,474						
City of Port Colborne	Second Concession Rd From Chippawa Rd To Carl Rd	4.5466	0.00975	\$0	\$12,493	\$0	\$12,493						
City of Port Colborne	Reuter Rd From Lake Erie To Durham St	1.4966	0.00321	\$0	\$3,690	\$0	\$3,690						
City of Port Colborne	Lakeshore Rd E From Reuter Rd To Snider Rd	0.726	0.00156	\$0	\$1,817	\$0	\$1,817						
City of Port Colborne	Snider Rd From Highway #3 To Second Concessions Rd	2.0239	0.00383	\$0	\$4,469	\$0	\$4,469						
City of Port Colborne	Snider Rd From Killaly St E To Highway #3	2.0275	0.00435	\$0	\$5,074	\$0	\$5,074						
City of Port Colborne	Killaly St E From Elizabeth St To Lorraine Rd	3.1333	0.00672	\$0	\$9,805	\$0	\$9,805						
City of Port Colborne	Lorraine Rd From Killaly St E To Highway #3	1.7385	0.00373	\$0	\$6,531	\$0	\$6,531						
City of Port Colborne	Babion Rd From Highway #3 To Second Concession Rd	2.2712	0.00487	\$0	\$7,483	\$0	\$7,483						
City of Port Colborne	Killaly St E - North Easement From Weaver Rd To Miller Rd	0.0903	0.00019	\$0	\$321	\$0	\$321						
City of Port Colborne	Killaly St E From Lorraine Rd To Miller Rd	2.7402	0.00588	\$0	\$9,749	\$0	\$9,749						
City of Port Colborne	Weaver Rd From Killaly St E To Highway #3	1.216	0.00261	\$0	\$4,326	\$0	\$4,326						
City of Port Colborne	Weaver Rd From Friendship Trail To Killaly St E	0.9939	0.00213	\$0	\$3,312	\$0	\$3,312						
City of Port Colborne	Snider Rd From Lake Erie To Killaly St E	4.8075	0.00910	\$0	\$10,451	\$0	\$10,451						
City of Port Colborne	Lorraine Rd From Lake Erie To Killaly St E	3.854	0.00827	\$0	\$8,018	\$0	\$8,018						
City of Port Colborne	Lakeshore Rd E From Snider Rd To Lorraine Rd	1.7236	0.00370	\$0	\$3,182	\$0	\$3,182						
MTO	Highway #3 From Elizabeth St To Babion Rd	2.8221	0.00676	\$0	\$7,894	\$0	\$7,894						
MTO	Highway #3 From Babion Rd To Weaver Rd	1.9479	0.00467	\$0	\$7,299	\$0	\$7,299						
MTO	Highway #3 From Weaver Rd To Miller Rd	1.2077	0.00289	\$0	\$4,762	\$0	\$4,762						
						45.680	0.0978	\$0	\$130,789	\$0	\$130,789	\$0.00	\$0.00

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Section 26 - Special Assessments

City of Port Colborne		\$3,989	\$3,989
Regional Municipality of Niagara	No roads assessed during design.	\$0	\$0
MINISTRY OF TRANSPORTATION ON	No special assessments during design.	\$0	\$0
Utilities - Enbridge	No conflicts assessed during design.	\$0	\$0
Utilities - Other	Protect existing Bell line in place or relocate at depth further south of proposed drain.	\$9,913	\$9,913
		\$13,902	\$13,902

Wignell Drain

Total Assessed:

\$1,570,792

Notes:

- The above lands marked "F" are currently classified as agricultural according to the OMAFRA and are therefore entitled to a 1/3 grant.
- Section 21 of the Drainage Act, RSO 1990 requires that assessments be shown for each parcel of land and road affected. The affected parcels of land are identified using the roll number received from the City. For convenience only, the owners' names are shown.
- The value of the assessments identified in this schedule are estimates only, and should not be considered final.

Wignell Branch Drains
City of Port Colborne
Regional Municipality of Niagara

Section 22: Assessed Benefit
Section 23 Outlet Benefit / Outlet Liability
Section 24 Special Benefit

Bower Branch Drain #1							Assessment			Total	Allowance	Net
Owner	Legal Text	Roll No	Area, Ha	Abutting, m	QRF Ratio	Benefit	Outlet Liability	Special				
City of Port Colborne - Lands Assessed												
JTI Integrated Machine Ltd	CON 1 PT LOT 23 RP 59R13636	271104000409801	2.2116	202	0.3391	\$0	\$1,315	\$0	\$1,315	\$0	\$1,315	
City of Port Colborne	59R11175 PART 1 59R11176	271104000699500	0.1737	0	0.0143	\$0	\$56	\$0	\$56	\$0	\$56	
Vale Canada Limited	CON 1 PT LOT 23	271102000718201	2.5985	84.7	0.3984	\$0	\$1,544	\$0	\$1,544	\$0	\$1,544	
Schlenger Uszer	CON 1 PT LOT 23	271104000408700	3.0301	208.8	0.1787	\$0	\$693	\$0	\$693	\$0	\$693	
						8.014	0.9306	\$0	\$3,607	\$0	\$3,607	
Roads												
City of Port Colborne	Reuter Rd From Lake Erie To Durham St		0.2773				0.0694	\$269	\$269	\$0	\$269	
						0.277	0.069	\$0	\$269	\$0	\$269	
Section 26 - Special Assessments												
City of Port Colborne									\$1,885	\$1,885	\$1,885	
MINISTRY OF TRANSPORTATION												
ONTARIO												
Utilities - Enbridge										\$0	\$0	
Utilities - Other										\$0	\$0	
								\$0	\$0	\$1,885	\$1,885	
Bower Branch Drain #1												
Total Assessed:										\$5,761	\$5,761	

Wignell Branch Drain #2							Assessment			Total	Allowance	Net
Owner	Legal Text	Roll No	Area, Ha	Abutting, m	QRF Ratio	Benefit	Outlet Liability	Special				
City of Port Colborne - Lands Assessed												
Pace Christopher Alan	CON 1 PT LOT 21	271104000405800	0.1384			\$0	\$19	\$0	\$19	\$982	-\$962	
Thalen William Douglas	CON 1 PT LOT 21	271104000406300	0.0676			\$0	\$9	\$0	\$9	\$0	\$9	
Fahay Kevin Thomas	CON 1 PT LOT 21 RP 59R14550	271104000406400	0.1884			\$0	\$26	\$0	\$26	\$0	\$26	
Lagace Raymond Yvon	CON 1 PT LOT 21 RP 59R4325	271104000406500	0.232			\$0	\$32	\$0	\$32	\$0	\$32	
Devries Susan Joanna	CON 1 PT LOT 21 RP 59R13702	271104000406600	0.2663			\$0	\$37	\$0	\$37	\$0	\$37	
Iovio Gregory Simon	CON 1 PT LOT 21 RP 59R13702	271104000406700	0.3055			\$0	\$43	\$0	\$43	\$0	\$43	
Riegle Colleen	CON 1 PT LOT 21	271104000406800	0.3654			\$0	\$51	\$0	\$51	\$0	\$51	
Bertulli David Raymond	CON 1 PT LOT 21	271104000406900	0.3944			\$0	\$55	\$0	\$55	\$0	\$55	
Pare Robert Laurent	CON 1 PT LOT 21	271104000407000	0.7472			\$0	\$104	\$0	\$104	\$574	-\$470	
Dunham Traci Lynn	CON 1 PT LOT 21	271104000407100	0.1113			\$0	\$16	\$0	\$16	\$0	\$16	
Bearss Douglas John	CON 1 PT LOT 21 PT LOT 22	271104000407200	2.7102			\$168	\$530	\$0	\$698	\$5,135	-\$4,436	
Hurkmans Robert William	CON 2 PT LOT 21	271104000409900	12.5466			\$0	\$2,456	\$0	\$2,456	\$0	\$2,456	
Vale Canada Limited	CON 2 PT LOT 21 RP59R3588	271104000410000	10.7611			\$0	\$2,106	\$0	\$2,106	\$0	\$2,106	
Sherry Vernob Eugene Martin	CON 2 PT LOT 21	271104000410100	4.0471			\$0	\$792	\$0	\$792	\$0	\$792	
Vale Canada Limited	CON 2 PT LOT 21 RP59R3588	271104000410101	0.121			\$0	\$17	\$0	\$17	\$0	\$17	
Rottier Matthew	CON 2 PT LOT 21	271104000410200	0.1517			\$0	\$21	\$0	\$21	\$0	\$21	
Dennis Wayne	CON 2 PT LOT 21	271104000410300	0.1824			\$0	\$26	\$0	\$26	\$0	\$26	
Huffman John Wayne	CON 2 PT LOT 21	271104000410400	0.1081			\$0	\$15	\$0	\$15	\$0	\$15	
Young Tammy Lynn	CON 2 PT LOT 21	271104000410500	0.105			\$0	\$15	\$0	\$15	\$0	\$15	
Vollick Ronald Christopher	CON 2 PT LOT 21	271104000410600	0.038			\$0	\$5	\$0	\$5	\$0	\$5	
Citrigno Angela	CON 2 PT LOT 21	271104000410700	0.0374			\$0	\$5	\$0	\$5	\$0	\$5	
Stark Raymond	CON 2 PT LOT 21 RP 59R4333	271104000410705	2.0105			\$0	\$394	\$0	\$394	\$0	\$394	
Elite Capital P.C Developments Inc	CON 2 PT LOT 22	271104000412600	8.6146			\$0	\$1,686	\$0	\$1,686	\$0	\$1,686	
Vale Canada Limited	CON 2 PT LOT 22 PT LOT 23	271104000412700	2.4726			\$0	\$484	\$0	\$484	\$0	\$484	
						46.723	\$168	\$8,946	\$0	\$9,114	\$6,691	
Roads												
City of Port Colborne	Killaly St E From Elizabeth St To Lorraine Rd		1.3756			\$24	\$654	\$678	\$678	\$678	\$678	
City of Port Colborne	Babion Rd From Killaly St E To Highway #3		0.8521			\$	\$405	\$405	\$405	\$405	\$405	
						2.228	\$24	\$1,059	\$1,083	\$1,083		
Section 26 - Special Assessments												
City of Port Colborne									\$17,969	\$17,969	\$17,969	
MINISTRY OF TRANSPORTATION												
ONTARIO												
Utilities - Enbridge										\$0	\$0	
Utilities - Other										\$0	\$0	
								\$24	\$0	\$17,969	\$17,969	
Wignell Branch Drain #2												
Total Assessed:										\$10,005	\$28,166	\$21,475

Wignell Branch Drain #3							Assessment			Total	Allowance	Net
Owner	Legal Text	Roll No	Area, Ha	Abutting, m	QRF Ratio	Benefit	Outlet Liability	Special				
City of Port Colborne - Lands Assessed												
Fehrman Paul Allan	HUMBERSTONE CON 2 PT LOT 20	271104000315700	25.1839			\$0	\$11,594	\$0	\$11,594	\$0	\$11,594	
Phillips Richard Gordon	CON 2 PT LOT 20 RP 59R-1546	271104000315702	1.3548			\$0	\$446	\$0	\$446	\$0	\$446	
Walker William Shawn Robert	HUMBERSTONE CON 2 PT LOT 20	271104000315705	0.9362			\$0	\$308	\$0	\$308	\$0	\$308	
Watson Carol Ann	CON 2 PT LOT 20	271104000315900	0.3731			\$0	\$123	\$0	\$123	\$0	\$123	
Brodeur Christa Nicole	CON 2 PT LOT 20	271104000316000	0.1245			\$0	\$41	\$0	\$41	\$0	\$41	
Lee Derek	CON 2 PT LOT 20	271104000316100	0.3439			\$0	\$113	\$0	\$113	\$0	\$113	
Bankert Helen Irene	CON 1 PT LOT 20	271104000317710	1.8461			\$0	\$850	\$0	\$850	\$5,736	-\$4,886	
Quesnelle Andrew	CON 1 PT LOT 20 PLAN 59R	271104000317800	0.582			\$0	\$191	\$0	\$191	\$1,593	-\$1,401	
						30.745	\$0	\$13,665	\$0	\$13,665	\$7,329	
Roads												
City of Port Colborne	Babion Rd From Killaly St E To Highway #3		0.8469				\$947	\$947	\$947	\$947	\$947	
City of Port Colborne	Killaly St E From Lorraine Rd To Miller Rd		0.4685				\$524	\$524	\$524	\$524	\$524	
City of Port Colborne	Lorraine Rd From Lake Erie To Killaly St E		0.0012				\$1	\$1	\$1	\$1	\$1	
MTO	Highway #3 From Babion Rd To Weaver Rd		0.2711				\$339	\$339	\$339	\$339	\$339	
						1.588	\$0	\$1,811	\$0	\$1,811	\$1,811	
Section 26 - Special Assessments												
City of Port Colborne									\$22,083	\$22,083	\$22,083	
MINISTRY OF TRANSPORTATION												
ONTARIO												
Utilities - Enbridge										\$0	\$0	
Utilities - Other										\$0	\$0	
								\$0	\$0	\$22,083	\$22,083	
Wignell Branch Drain #3												
Total Assessed:										\$15,476	\$37,559	\$30,230

Table 11 Maintenance Schedule

Wignell Municipal Drain
City of Port Colborne
Regional Municipality of Niagara

Maintenance Schedule
Wignell Drain

Owner	Legal_Txt	Roll No	Land Area			Watershed				
			Ha	Area in Drain Ha	Runoff Factor 'C'	QRF	SWM	SWMF	QRF-SWMF	QRF Ratio
City of Port Colborne - Lands Assesed										
Solbach Katherine Jestina	HUMBERSTONE CON 1 PT LOT 23	2711-020-007-00800	0.467	0.220	20	0.28640	0	0	0.28640	0.00011
Lee Christopher Bernard	HUMBERSTONE CON 1 PT LOT 23 AND PT WATER LOT	2711-020-007-00900	0.556	0.110	20	0.14342	0	0	0.14342	0.00006
Hifpner Layton	CON 1 PT LOT 23	2711-020-007-01300	0.509	0.509	20	0.66453	0	0	0.66453	0.00026
Vale Canada Limited	HUMBERSTONE CON 1 PT LOTS 24 TO 26 PT WATER LOT PT RD ALLOW PLAN 849 LOTS 1 TO 4 W DAVIS ST AND E MITCHELL ST LOTS 6 AND 7 N LAKE ST PT PARK LOTS 1 TO 5 S DURHAM ST	2711-020-007-18000	139.588	0.080	20	0.10470	0	0	0.10470	0.00004
Vale Canada Limited	HUMBERSTONE CON 1 PT LOTS 24 TO 26 PT WATER LOT PT RD ALLOW PLAN 849 LOTS 1 TO 4 W DAVIS ST AND E MITCHELL ST LOTS 6 AND 7 N LAKE ST PT PARK LOTS 1 TO 5 S DURHAM ST	2711-020-007-18000	1.734	1.735	30	3.39494	0	0	3.39494	0.00131
Port Wilder Land Inc	CON 1 PT LOT 23	2711-020-007-18201	2.598	2.598	85	14.40963	0	0	14.40963	0.00557
Vale Canada Limited	CON 1 PT TWP LOT 23	2711-020-007-18300	0.186	0.186	30	0.36388	0	0	0.36388	0.00014
PC City Hall	CON 1 PT TWP LOT 23	2711-020-007-18400	0.334	0.334	30	0.65448	0	0	0.65448	0.00025
Vale Canada Limited	CON 1 PT TWP LOT 23	2711-020-007-18500	0.374	0.374	30	0.73126	0	0	0.73126	0.00028
Vale Canada Limited	CON 1 PT TWP LOT 23	2711-020-007-18600	0.371	0.372	30	0.72719	0	0	0.72719	0.00028
Vale Canada Limited	CON 1 PT TWP LOT 23	2711-020-007-18700	0.186	0.186	30	0.36375	0	0	0.36375	0.00014
Vale Canada Limited	HUMBERSTONE CON 1 PT LOT 23	2711-020-007-18800	1.647	1.648	30	3.22461	0	0	3.22461	0.00125
Vale Canada Limited	CON 1 PT TWP LOT 23 RP 59R10985 PART 1	2711-020-007-18900	2.228	2.229	30	4.36222	0	0	4.36222	0.00169
McLean William Richard Samue	CON 1 PT TWP LOT 23	2711-020-013-11300	0.205	0.095	25	0.15499	0	0	0.15499	0.00006
Farril Vincent	CON 1 PT TWP LOT 23	2711-020-013-11400	0.190	0.191	25	0.31076	0	0	0.31076	0.00012
Scott Gregory George	CON 1 PT TWP LOT 23	2711-020-013-11500	0.190	0.190	25	0.31048	0	0	0.31048	0.00012
Elite Cap PC Holdings Inc	CON 2 PT LOT 24	2711-020-013-12000	3.208	0.534	35	1.21824	0	0	1.21824	0.00047
Jarry Terry Alan	CON 2 PT LOT 17	2711-040-003-08000	4.071	4.073	35	9.29928	0	0	9.29928	0.00360
Mackay Graham	CON 2 PT LOT 17	2711-040-003-08100	4.071	4.068	35	9.28989	0	0	9.28989	0.00359
Bury Alexander	CON 2 PT LOT 17	2711-040-003-08101	4.072	4.073	35	9.29973	0	0	9.29973	0.00360
Ruston Earl John	CON 2 PT LOT 17	2711-040-003-08200	16.096	1.597	35	3.64664	0	0	3.64664	0.00141
Fehrman Paul Allan	HUMBERSTONE CON 2 PT LOT 17	2711-040-003-08201	12.527	5.955	35	12.77598	0	0	12.77598	0.00494
Fehrman Mark David	HUMBERSTONE CON 2 PT LOT 17 RP 59R15085 PART 1	2711-040-003-08203	0.492	0.256	25	0.41830	0	0	0.41830	0.00016
1970065 Ontario Inc	CON 2 PT LOT 17	2711-040-003-08300	10.102	6.417	52	21.76813	0	0	21.76813	0.00842
Li Yue	CON 2 PT LOT 17	2711-040-003-08400	4.071	2.706	35	6.17982	0	0	6.17982	0.00239
Noel Marc Raymond	CON 2 PT LOT 17	2711-040-003-08401	4.072	2.679	35	6.11752	0	0	6.11752	0.00237
Fabi David George	CON 2 PT LOT 17	2711-040-003-08500	4.032	4.033	35	9.20866	0	0	9.20866	0.00356
Vince Terrance Andrew	CON 2 PT LOT 17RP 59R13523 PART 1	2711-040-003-08600	0.562	0.562	25	0.91613	0	0	0.91613	0.00035
Vince Terrance Andrew	CON 2 PT LOT 17	2711-040-003-08601	0.175	0.175	25	0.28525	0	0	0.28525	0.00011
Bowman Douglas Murray	CON 2 PT LOT 17	2711-040-003-08700	15.516	15.520	35	35.43796	0	0	35.43796	0.01371
Cooper Morgan Katherine	CON 1 PT LOT 18	2711-040-003-10200	4.100	2.153	35	4.91699	0	0	4.91699	0.00190
Ladd Sharon Lynn	CON 2 PT LOT 19	2711-040-003-10201	8.232	8.234	35	18.80141	0	0	18.80141	0.00727
Bankert David Roy	CON 1 PT LOT 18	2711-040-003-10300	15.449	5.311	35	12.12643	0	0	12.12643	0.00469
Port Colborne Quarries Inc	CON 2 PT LOT 18	2711-040-003-11200	19.983	19.989	35	45.64233	0	0	45.64233	0.01765
Bonin Emma Sylvia	CON 2 PT LOT 18	2711-040-003-11201	1.677	1.677	25	2.73530	0	0	2.73530	0.00106
Ruston James Daryl	CON 2 PT LOT 18	2711-040-003-11202	3.342	2.254	35	5.14576	0	0	5.14576	0.00199
Rankin Engineering Inc	HUMBERSTONE CON 2 PT LOT 18 AND RP 59R3391 PT PART 1	2711-040-003-11300	10.329	10.331	35	23.59080	0	0	23.59080	0.00912
Van Boom Maria	CON 2 PT LOT 18	2711-040-003-11400	0.622	0.622	25	1.01447	0	0	1.01447	0.00039
Fehrman John Paul	HUMBERSTONE CON 2 PT LOT 18 AND RP 59R9411 PART 3	2711-040-003-11500	14.338	14.086	35	32.16362	0	0	32.16362	0.01244
Jacques Timothy Maurice	CON 2 PT LOT 18 RP 59R9411 PART 1	2711-040-003-11600	0.408	0.408	25	0.66606	0	0	0.66606	0.00026
Bankert Ralph Edward	CON 2 PT LOT 18 RP 59R9411 PART 2 PART 4	2711-040-003-11700	0.670	0.074	25	0.12034	0	0	0.12034	0.00005
Leaman Carol Christine	CON 2 PT LOT 19	2711-040-003-12100	0.125	0.125	25	0.20379	0	0	0.20379	0.00008
Seredine Michael Nicholas	CON 2 PT LOT 19	2711-040-003-12200	0.075	0.075	25	0.12303	0	0	0.12303	0.00005
Hobbs Edward George	CON 2 PT LOT 19	2711-040-003-12300	0.167	0.167	25	0.27228	0	0	0.27228	0.00011
Wright Timothy James	CON 2 PT LOT 19	2711-040-003-12400	0.576	0.576	25	0.93897	0	0	0.93897	0.00036
Shave Harry Albert	CON 2 PT LOT 19	2711-040-003-12500	0.400	0.400	25	0.65313	0	0	0.65313	0.00025
Van Schaik Thomas Albert	CON 2 PT LOT 19	2711-040-003-12600	0.405	0.405	25	0.66606	0	0	0.66606	0.00026
1000149971 Ontario Corporation	CON 2 PT LOT 19	2711-040-003-12700	1.283	1.284	25	2.09379	0	0	2.09379	0.00081
Butters Larry R	CON 2 PT LOT 19	2711-040-003-12800	0.235	0.235	25	0.38292	0	0	0.38292	0.00015
Landry Rita	CON 2 PT LOT 19	2711-040-003-12900	0.161	0.161	25	0.26212	0	0	0.26212	0.00010
Doolittle Douglas Burklin	PLAN 19 LOT 23 LOT 24 NP778	2711-040-003-14300	1.427	0.071	20	0.09285	0	0	0.09285	0.00004
Leblanc Marc	PLAN 19 PT LOT 25 PT LOT 26 NP778	2711-040-003-14500	0.443	0.289	20	0.37678	0	0	0.37678	0.00015
Pye Laurie Lynne	CON 1 PT LOT 19 PT LOT 20	2711-040-003-14600	26.481	12.370	35	28.24555	0	0	28.24555	0.01092
Bankert David Roy	CON 1 PT LOT 19 RP 59R12136 PARTS 1 AND 2	2711-040-003-14700	10.513	3.938	35	8.99152	0	0	8.99152	0.00348
Little Lisa Marie	CON 1 PT LOT 19 RP 59R1775 PART 1	2711-040-003-14900	2.689	2.690	35	6.14184	0	0	6.14184	0.00238
Vandebeled Grace Elizabeth	CON 1 PT LOT 19 PT LOT 20	2711-040-003-15000	22.938	22.944	35	52.39039	0	0	52.39039	0.02026
Hennigar Vernon Charles	HUMBERSTONE CON 2 PT LOT 19 AND RP 59R14613 PART 1	2711-040-003-15100	0.694	0.695	25	1.13285	0	0	1.13285	0.00044
Crawford David Emerson T	HUMBERSTONE CON 2 PT LOT 19 RP 59R17241 PART 1	2711-040-003-15101	1.655	1.655	25	2.70012	0	0	2.70012	0.00104
Ladd Sharon Lynn	CON 2 PT LOT 19	2711-040-003-15102	2.497	2.498	35	5.70408	0	0	5.70408	0.00221
Ladd Kevin Wilfred	CON 2 PT LOT 19	2711-040-003-15200	0.370	0.370	30	0.72395	0	0	0.72395	0.00028
Fehrhaven Farms Inc	HUMBERSTONE CON 2 PT LOT 19 RP 59R17241 PARTS 2 AND 3	2711-040-003-15300	0.066	0.067	30	0.13017	0	0	0.13017	0.00005
1970065 Ontario Inc	HUMBERSTONE CON 2 PT LOTS 18 AND 19 PT RD ALLOW AND RP 59R16702 PARTS 1 AND 2	2711-040-003-15305	59.545	59.561	35	136.00171	0	0	136.00171	0.05260
Rankin Engineering Inc	CON 2 PT LOT 19	2711-040-003-15400	3.801	3.802	25	6.20114	0	0	6.20114	0.00240
2053048 Ontario Inc	CON 2 PT LOT 19	2711-040-003-15500	2.188	2.189	25	3.56983	0	0	3.56983	0.00138
Port Colborne Quarries Inc	HUMBERSTONE CON 2 PT LOTS 19 AND 20 RP 59R8010 PT PART 2	2711-040-003-15600	69.987	70.006	35	159.85194	0	0	159.85194	0.06182
Fehrman Paul Allan	HUMBERSTONE CON 2 PT LOT 20 RP 59R8342 PT PART 1	2711-040-003-15700	29.087	29.095	35	66.43654	0	0	66.43654	0.02570
Phillips Richard Gordon	CON 2 PT LOT 20 RP 59R-1546 PARTS 1,2,3	2711-040-003-15702	1.354	1.355	25	2.20960	0	0	2.20960	0.00085
Walker William Shawn Robert	HUMBERSTONE CON 2 PT LOT 20 RP 59R15509 PART 1	2711-040-003-15705	0.944	0.944	25	1.53954	0	0	1.53954	0.00060
Watson Carol Ann	CON 2 PT LOT 20	2711-040-003-15900	0.373	0.373	25	0.60859	0	0	0.60859	0.00024
Brodeur Christa Nicole	CON 2 PT LOT 20	2711-040-003-16000	0.124	0.125	25	0.20311	0	0	0.20311	0.00008
Lee Derek	CON 2 PT LOT 20	2711-040-003-16100	0.344	0.344	25	0.56098	0	0	0.56098	0.00022
Shibley Chad William	CON 2 PT LOT 19	2711-040-003-16200	0.254	0.254	25	0.41363	0	0	0.41363	0.00016
Interisano Tyler John	CON 2 PT LOT 19 RP 59R2896 PART 1	2711-040-003-16300	3.085	3.086	35	7.04561	0	0	7.04561	0.00272
Long Mark Christopher	CON 2 PT LOT 19	2711-040-003-16400	0.453	0.453	25	0.73863	0	0	0.73863	0.00029
Harrington Peter Anthony	CON 2 PT LOT 19	2711-040-003-16500	4.889	4.891	35	11.16734	0	0	11.16734	0.00492
Burke Michael	CON 2 PT LOT 19 RP 59R12723 PART 1	2711-040-003-16600	0.174	0.174	35	0.28355	0	0	0.28355	0.00011
Burke Michael	CON 2 PT LOT 19	2711-040-003-16700	0.220	0.220	25	0.35865	0	0	0.35865	0.00014
Phillips Charles Milton	CON 2 PT LOT 19 PLAN 59R 7048 PART 1	2711-040-003-16800	0.119	0.119	25	0.19432	0	0	0.19432	0.00008
Reles David Leonard	CON 2 PT LOT 19	2711-040-003-16900	0.242	0.242	25	0.39486	0	0	0.39486	0.00015
King Carl Rodney	CON 2 PT LOT 19	2711-040-003-17000	0.198	0.198	25	0.32360	0	0	0.32360	0.00013
Arsenault Henri Claude	CON 2 PT LOT 19	2711-040-003-17100	0.210	0.210	25	0.34290	0	0	0.34290	0.00013
Gillespie Evan John	CON 2 PT LOT 19 RP 59R10597 PART 1	2711-040-003-17200	0.221	0.221	25	0.36026	0	0	0.36026	0.00014
Smith Reginald Garfield	CON 2 PT LOT									

Table 11 Maintenance Schedule

Owner	Legal Txt	Land Area			Watershed					
		Roll No	Area in Drain	Runoff						
Weebaduarachigye Asela	CON 1 PT LOT 21 PT WATER LOT RP 59R5808 PART 1	2711-040-004-00102	0.874	0.513	20	0.66930	0	0	0.66930	0.00026
Neumann Gary	CON 1 PT LOT 21	2711-040-004-00300	0.586	0.385	20	0.50188	0	0	0.50188	0.00019
Frame John Douglas	HUMBERSTONE CON 1 PT LOT 21 PT WATER LOT RP 59R9880 PARTS 1 AND 2	2711-040-004-00305	0.872	0.553	20	0.72212	0	0	0.72212	0.00028
Matheson Gary	CON 1 PT LOT 21	2711-040-004-00400	0.663	0.414	20	0.54072	0	0	0.54072	0.00021
White Stephen Christopher	CON 1 PT LOT 21 RP59R 9880 PART 3	2711-040-004-00500	1.304	1.150	20	1.50020	0	0	1.50020	0.00058
McKay Terence	CON 1 PT LOT 21 PT WATER LOT RP 59R5181 PART 1 PART 2	2711-040-004-00505	1.816	0.753	20	0.98235	0	0	0.98235	0.00038
Stivoric Joseph Michael	CON 1 PT LOT 21 RP 59R9381 PARTS 8 TO 12	2711-040-004-00510	1.238	0.058	20	0.07533	0	0	0.07533	0.00003
Singh Anthony	CON 1 PT LOT 21 RP 59R12934 PART 1 RP 59R13445 PART 1	2711-040-004-00620	0.878	0.113	20	0.14806	0	0	0.14806	0.00006
Bowman Patricia May	CON 1 PT LOT 22 PT WATER LOT	2711-040-004-00700	4.337	0.156	20	0.20316	0	0	0.20316	0.00008
Cunningham Jesse	CON 1 PT LOT 22	2711-040-004-00800	0.233	0.061	20	0.07931	0	0	0.07931	0.00003
Peichat Brock	CON 1 PT LOT 22	2711-040-004-00820	0.086	0.033	20	0.04344	0	0	0.04344	0.00002
MacNeil Robert Joseph F	CON 1 PT LOT 22	2711-040-004-00900	0.400	0.400	20	0.52207	0	0	0.52207	0.00020
Anthony Thomas	CON 1 PT LOT 22	2711-040-004-01000	3.432	0.015	20	0.01899	0	0	0.01899	0.00001
Cudmore Blair	CON 1 PT LOT 22	2711-040-004-01100	1.330	0.055	20	0.07155	0	0	0.07155	0.00003
Talano David	CON 1 PT LOT 22	2711-040-004-01200	1.349	0.099	20	0.12931	0	0	0.12931	0.00005
Zahn Jeffrey Bard	59R4853 PART 1	2711-040-004-01300	0.648	0.115	20	0.15039	0	0	0.15039	0.00006
Colling Candace Nadine	PT WATER LOT 59R3741 PART 1	2711-040-004-01301	0.068	0.088	20	0.11457	0	0	0.11457	0.00004
Dietrich Law Firm PC	CON 1 PT LOT 22 RP59R4853 PART 2	2711-040-004-01400	0.912	0.081	20	0.10507	0	0	0.10507	0.00004
Cassan James Cameron Gregory	CON 1 PT LOT 22	2711-040-004-01500	0.385	0.096	20	0.12560	0	0	0.12560	0.00005
Hall Valerie	CON 1 PT LOT 22	2711-040-004-01700	0.447	0.248	20	0.32415	0	0	0.32415	0.00013
McKeil Blair Daniel	CON 1 PT LOT 23 RP 59R3304 PART 1	2711-040-004-01800	0.960	0.490	20	0.63991	0	0	0.63991	0.00025
Gabriele Janice Ann	CON 1 PT LOT 23	2711-040-004-02100	0.519	0.282	20	0.36831	0	0	0.36831	0.00014
Peacock Kent William	CON 1 PT LOT 23	2711-040-004-02300	0.589	0.294	20	0.38323	0	0	0.38323	0.00015
Moscip Pearl Hope	CON 1 PT LOT 23 AND PT WATER LOT	2711-040-004-02400	0.206	0.073	20	0.09478	0	0	0.09478	0.00004
Peppas Apostolos Paul	CON 1 PT LOT 23 AND PT WATER LOT	2711-040-004-02500	0.419	0.144	20	0.18757	0	0	0.18757	0.00007
Nagle Gary Patrick	CON 1 PT LOT 23 AND PT WATER LOT	2711-040-004-02600	0.473	0.148	20	0.19329	0	0	0.19329	0.00007
Scarlett Rebecca Ann	CON 1 PT LOT 23 AND PT WATER LOT	2711-040-004-02700	0.407	0.133	20	0.17390	0	0	0.17390	0.00007
Papadakis Patricia	CON 1 PT LOT 23	2711-040-004-02801	0.148	0.138	20	0.17962	0	0	0.17962	0.00007
Coury Corinne	CON 1 PT LOT 23 PT WATER LOT RP59R3560 PART 2	2711-040-004-02900	0.462	0.124	20	0.16216	0	0	0.16216	0.00006
Duffy John	CON 1 PT LOT 23 RP 59R10985 PART 3	2711-040-004-02901	0.430	0.430	20	0.56099	0	0	0.56099	0.00022
Maloney John David	CON 1 PT LOT 23 PT WATER LOT RP59R3560 PART 1	2711-040-004-02902	0.487	0.119	20	0.15503	0	0	0.15503	0.00006
Pruyn Francis M R	CON 1 PT LOT 23 RP 59R10985 PART 2	2711-040-004-02905	0.570	0.570	20	0.74392	0	0	0.74392	0.00029
McQuillin Vanessa	CON 1 PT LOT 23	2711-040-004-03000	0.277	0.277	20	0.36175	0	0	0.36175	0.00014
Vale Canada Limited	HUMBERSTONE CON 1 PT LOT 23	2711-040-004-03100	0.118	0.064	20	0.08413	0	0	0.08413	0.00003
Siba Jayne Leslie	CON 1 PT LOT 23	2711-040-004-03200	0.276	0.276	20	0.36662	0	0	0.36662	0.00014
Peshimam Abd Zahoor	CON 1 PT LOT 23	2711-040-004-03300	0.238	0.238	20	0.31018	0	0	0.31018	0.00012
Dutcher Lori	CON 1 PT LOT 23	2711-040-004-03400	0.236	0.236	20	0.30752	0	0	0.30752	0.00012
Soldat Lesley	CON 1 PT LOT 23	2711-040-004-03500	0.233	0.233	20	0.30418	0	0	0.30418	0.00012
Lawson Snider	CON 1 PT LOT 23 RP59R7556 PART 1	2711-040-004-03600	0.408	0.408	20	0.53269	0	0	0.53269	0.00021
Ramautarsingh Lindsey D	CON 1 PT LOT 23 PLAN 59R7556 PART 2 3 4	2711-040-004-03605	0.407	0.407	20	0.53081	0	0	0.53081	0.00021
Vale Canada Limited	HUMBERSTONE CON 1 PT LOT 23	2711-040-004-03700	7.778	7.780	30	15.22661	0	0	15.22661	0.00589
Vale Canada Limited	HUMBERSTONE CON 1 PT LOT 22	2711-040-004-03710	1.714	1.715	30	3.35609	0	0	3.35609	0.00130
Vale Canada Limited	HUMBERSTONE CON 1 PT LOT 22	2711-040-004-03720	6.457	6.459	30	12.64188	0	0	12.64188	0.00489
Arnold Alicia	CON 1 PT LOT 22	2711-040-004-03800	0.380	0.380	20	0.49591	0	0	0.49591	0.00019
Snider Harvey Wilson	CON 1 PT LOT 22	2711-040-004-03900	0.264	0.264	20	0.34413	0	0	0.34413	0.00013
Roman Catholic Episcopal Corporat	CON 1 PT LOT 22	2711-040-004-04100	2.600	2.601	45	7.63498	0	0	7.63498	0.00295
Mitchell Timothy J	CON 1 PT LOT 22	2711-040-004-04200	1.150	1.150	20	1.50061	0	0	1.50061	0.00058
Nieuwland Kevin	HUMBERSTONE CON 1 PT LOT 22 RP 59R13926A PART 4	2711-040-004-04300	3.814	3.815	30	7.46624	0	0	7.46624	0.00289
570466 Ontario Limited	CON 1 PT LOT 21	2711-040-004-04301	5.116	5.117	35	11.68411	0	0	11.68411	0.00452
Mason Martha Jeanne	CON 1 PT LOT 21	2711-040-004-04303	3.067	3.068	30	6.00514	0	0	6.00514	0.00232
Nieuwland Kevin	HUMBERSTONE CON 1 PT LOT 22 RP 59R13926A PARTS 1 TO 3	2711-040-004-04320	0.445	0.445	20	0.58036	0	0	0.58036	0.00022
Gibbs Irene	CON 1 PT LOT 21	2711-040-004-04400	0.442	0.442	25	0.72034	0	0	0.72034	0.00028
Nicholls Larry James	CON 1 PT LOT 21	2711-040-004-04500	1.220	1.220	25	1.99031	0	0	1.99031	0.00077
Winger Loyd James Junior	CON 1 PT LOT 21	2711-040-004-04600	0.848	0.849	25	1.38417	0	0	1.38417	0.00054
Martin James Alan	CON 1 PT LOT 21 PLAN 59R6790 PART 1	2711-040-004-04601	0.405	0.405	25	0.66035	0	0	0.66035	0.00026
Whisky Run Golf Club Ltd	CON 1 PT LOT 21 PT LOT 22 RP 59R8112 PART 1	2711-040-004-04700	18.771	18.777	35	42.87469	0	0	42.87469	0.01658
Bankert David Roy	HUMBERSTONE CON 1 PT LOT 21	2711-040-004-04800	13.851	13.855	35	31.63718	0	0	31.63718	0.01224
Spliteri Claudia Maria	PART 1	2711-040-004-04802	0.681	0.681	25	1.11132	0	0	1.11132	0.00043
Talbot Jason J	CON 1 PT LOT 21	2711-040-004-04900	0.316	0.316	25	0.51529	0	0	0.51529	0.00020
Vale Canada Limited	CON 1 PT LOT 21 RP 59R4948 PART 1	2711-040-004-05000	0.347	0.348	25	0.56683	0	0	0.56683	0.00022
Vale Canada Limited	CON 1 PT LOT 21 PT LOT 22	2711-040-004-05100	15.395	15.399	35	35.16163	0	0	35.16163	0.01360
Vale Canada Limited	CON 1 PT LOT 21	2711-040-004-05200	7.939	7.941	35	18.13260	0	0	18.13260	0.00701
Arsenault Robert Eugene	CON 1 PT LOT 21	2711-040-004-05300	0.236	0.236	25	0.38548	0	0	0.38548	0.00015
Perron Alysha Marie	CON 1 PT LOT 21	2711-040-004-05400	0.340	0.340	25	0.55492	0	0	0.55492	0.00021
Peterson Chad Allan	CON 1 PT LOT 21	2711-040-004-05500	9.483	9.486	35	21.66058	0	0	21.66058	0.00838
Kriter Robert	HUMBERSTONE CON 1 PT LOT 21 AND 22 RP 59R10301 PART 2	2711-040-004-05600	3.068	3.069	35	7.00793	0	0	7.00793	0.00271
Paxton Matthew Ryan	HUMBERSTONE CON 1 PT LOT 21 AND 22 RP 59R10301 PART 6	2711-040-004-05602	3.049	3.050	35	6.96485	0	0	6.96485	0.00269
Moskalyk John Joseph	CON 1 PT LOT 21	2711-040-004-05700	6.807	6.809	35	15.54789	0	0	15.54789	0.00601
Pace Christopher Alan	CON 1 PT LOT 21	2711-040-004-05800	1.794	1.795	25	2.92740	0	0	2.92740	0.00113
Bodoros Brian	CON 1 PT LOT 21 RP 59R9110 PT 1	2711-040-004-05900	0.151	0.151	25	0.24605	0	0	0.24605	0.00010
Besselink Leo	CON 1 PT LOT 21	2711-040-004-06000	0.331	0.332	25	0.54076	0	0	0.54076	0.00021
Vanderhoeke James Anthony	CON 1 PT LOT 21	2711-040-004-06100	0.335	0.335	25	0.54615	0	0	0.54615	0.00021
Sieber Michael Joseph	CON 1 PT LOT 21	2711-040-004-06200	0.366	0.366	25	0.59735	0	0	0.59735	0.00023
Thalen William Douglas	CON 1 PT LOT 21	2711-040-004-06300	0.511	0.511	25	0.83299	0	0	0.83299	0.00032
Fahy Kevin Thomas	CON 1 PT LOT 21 RP 59R14550 PART 1	2711-040-004-06400	0.416	0.416	25	0.67869	0	0	0.67869	0.00026
Lagace Raymond Yvon	CON 1 PT LOT 21 RP 59R4325 PART 1	2711-040-004-06500	0.416	0.416	25	0.67878	0	0	0.67878	0.00026
Devries Susan Joanna	CON 1 PT LOT 21 RP 59R13702 PART 1	2711-040-004-06600	0.416	0.416	25	0.67876	0	0	0.67876	0.00026
Lovio Gregory Simon	CON 1 PT LOT 21 RP 59R13702 PART 2	2711-040-004-06700	0.416	0.416	25	0.67874	0	0	0.67874	0.00026
Riegle Colleen	CON 1 PT LOT 21	2711-040-004-06800	0.415	0.415	25	0.67676	0	0	0.67676	0.00026
Bartulli David Raymond	CON 1 PT LOT 21	2711-040-004-06900	0.399	0.399	25	0.65081	0	0	0.65081	0.00025
Pare Robert Laurent	CON 1 PT LOT 21	2711-040-004-07000	0.747	0.747	25	1.21874	0	0	1.21874	0.00047
Dunham Traci Lynn	CON 1 PT LOT 21	2711-040-004-07100	0.111	0.111	25	0.18147	0	0	0.18147	0.00007
Bearss Douglas John	CON 1 PT LOT 21 PT LOT 22	2711-040-004-07200	5.648	5.650	35	12.90028	0	0	12.90028	0.00499
White Margaret Ann	CON 1 PT LOT 22	2711-040-004-07300	9.073	9.076	35	20.72408	0	0	20.72408	0.00802
White Margaret Ann	CON 1 PT LOT 22	2711-040-004-07300	5.225	5.226	35	11.93397	0			

Table 11 Maintenance Schedule

Owner	Legal_Txt	Roll No	Land Area		Runoff	Watershed				
			Area in Drain	25		0	0	0	0	
Polverari Giuseppe	CON 1 PT LOT 23	2711-040-004-09700	0.190	0.190	25	0.31021	0	0	0.31021	0.00012
S G Red III Land Corp	HUMBERSTONE CON 1 PT LOTS 23 AND 24 SRO	2711-040-004-09800	6.080	5.747	30	11.24829	0	0	11.24829	0.00435
JTL Integrated Machine Ltd	CON 1 PT LOT 23 RP 59R13636 PARTS 1 AND 2	2711-040-004-09801	2.211	2.212	85	12.26441	0	0	12.26441	0.00474
Vale Canada Limited	CON 1 PT LOT 23	2711-040-004-09802	3.947	3.949	30	7.72822	0	0	7.72822	0.00299
Elite 869 Killaly Holdings Inc	CON 2 PT LOT 21	2711-040-004-09900	12.543	12.547	35	28.64897	0	0	28.64897	0.01108
Elite Cap PC Holdings Inc	CON 2 PT LOT 21 RP 59R3588 PART 1	2711-040-004-10000	15.727	15.732	35	35.92162	0	0	35.92162	0.00389
Sherry Vernon Eugene Martin	CON 2 PT LOT 21	2711-040-004-10100	4.046	4.047	35	9.24122	0	0	9.24122	0.01357
Vale Canada Limited	CON 2 PT LOT 21 RP59R3588 PART 2	2711-040-004-10101	0.121	0.121	25	0.19738	0	0	0.19738	0.00008
Baillargeon Steve	CON 2 PT LOT 21	2711-040-004-10200	0.152	0.152	25	0.24750	0	0	0.24750	0.00010
Dennis Wayne	CON 2 PT LOT 21	2711-040-004-10300	0.182	0.182	25	0.29751	0	0	0.29751	0.00012
Huffman John Wayne	CON 2 PT LOT 21	2711-040-004-10400	0.179	0.179	25	0.29253	0	0	0.29253	0.00011
Young Tammy Lynn	CON 2 PT LOT 21	2711-040-004-10500	0.212	0.212	25	0.34602	0	0	0.34602	0.00013
2867781 Ontario Inc	CON 2 PT LOT 21	2711-040-004-10600	0.197	0.197	25	0.32194	0	0	0.32194	0.00012
Citrigno Angela	CON 2 PT LOT 21	2711-040-004-10700	0.205	0.205	25	0.33437	0	0	0.33437	0.00013
Stark Raymond	CON 2 PT LOT 21 RP 59R4333 PART 1	2711-040-004-10705	3.953	3.954	35	9.02858	0	0	9.02858	0.00349
Konc John Andrew	CON 2 PT LOT 22 RP 59R4801 PART 3	2711-040-004-10710	2.898	2.899	35	6.61924	0	0	6.61924	0.00256
Van Ruyven Josef Nicolaas	CON 2 PT LOT 22 RP 59R4801 PART 2	2711-040-004-10800	4.198	4.199	35	9.58787	0	0	9.58787	0.00371
Stewart Scott James	CON 2 PT LOT 22 RP 59R 5732 PART 1	2711-040-004-10810	0.406	0.407	25	0.66314	0	0	0.66314	0.00086
705 Main PC Holdings Inc	CON 2 PT LOT 22 RP59R4801 PART 1	2711-040-004-10900	7.709	7.711	35	17.60825	0	0	17.60825	0.00681
Hellinga Jack Simon	CON 2 PT LOT 22	2711-040-004-11000	5.409	5.411	25	8.82521	0	0	8.82521	0.00341
Kinzle Patricia Helen	CON 2 PT LOT 21 RP 59R6766 PART 2	2711-040-004-11200	1.202	1.202	25	1.96028	0	0	1.96028	0.00076
Pipher Lynn Mae	CON 2 PT LOT 21 RP 59R6766 PART 1	2711-040-004-11205	1.208	1.208	25	1.97068	0	0	1.97068	0.00076
Scaze Wesley	CON 2 PT LOT 21	2711-040-004-11300	0.067	0.067	25	0.10901	0	0	0.10901	0.00044
Port Colborne Quarries Inc	CON 2 PT LOT 21 PT LOT 22 RP 59R8010 PART 1	2711-040-004-11500	73.150	73.171	35	167.07763	0	0	167.07763	0.00662
Parsons David Scott	CON 2 PT LOT 22	2711-040-004-11600	0.418	0.418	25	0.68182	0	0	0.68182	0.00026
Leavere Larry Allan Thomas	CON 2 PT LOT 22	2711-040-004-11700	0.209	0.209	25	0.34099	0	0	0.34099	0.00013
Yanni Bill	CON 2 PT LOT 22	2711-040-004-11900	0.418	0.418	25	0.68183	0	0	0.68183	0.00026
Fitzgerald Shawn Patrick	HUMBERSTONE CON 2 PT LOT 22	2711-040-004-12000	0.209	0.209	25	0.34122	0	0	0.34122	0.00013
Orowski Jeffrey	CON 2 PT LOT 22 RP 59R4884 PART 1	2711-040-004-12100	0.209	0.209	25	0.34106	0	0	0.34106	0.00013
Moes Frank Allan	HUMBERSTONE CON 2 PT LOT 22	2711-040-004-12200	0.357	0.357	25	0.58216	0	0	0.58216	0.00023
Boda Terry Joseph	CON 2 PT LOT 22	2711-040-004-12400	0.186	0.186	25	0.30303	0	0	0.30303	0.00012
Elite Capital P.C.Developments Inc	CON 2 PT LOT 22	2711-040-004-12600	12.728	12.732	35	29.07222	0	0	29.07222	0.01124
Elite Cap PC Holdings Inc	CON 2 PT LOT 22 PT LOT 23	2711-040-004-12700	12.623	12.627	35	28.83250	0	0	28.83250	0.01115
Elite Cap PC Holdings Inc	CON 2 PT LOT 22 PT LOT 23	2711-040-004-12700	26.275	22.193	35	50.67553	0	0	50.67553	0.01960
Elite Cap PC Holdings Inc	CON 2 PT LOT 23	2711-040-004-12800	0.363	0.363	30	0.71104	0	0	0.71104	0.00028
NCD5B	CON 2 PT LOT 23	2711-040-004-12900	5.945	5.947	30	11.63961	0	0	11.63961	0.00450
Dyson Patrick James	CON 2 PT LOT 23	2711-040-004-13000	0.176	0.176	25	0.28690	0	0	0.28690	0.00011
Dyson Mary Lynn	CON 2 PT LOT 23	2711-040-004-13100	0.181	0.182	25	0.29611	0	0	0.29611	0.00011
Hortobagyi Zoltan	CON 2 PT LOT 23	2711-040-004-13200	0.186	0.186	25	0.30304	0	0	0.30304	0.00012
Wakunich Deborah Ivy	CON 2 PT LOT 24	2711-040-004-13300	0.580	0.585	25	0.13920	0	0	0.13920	0.00005
Wells Donna Louise	CON 2 PT LOT 23 PT LOT 24 RP59R-6141 PART 7	2711-040-004-13400	0.852	0.424	25	0.69202	0	0	0.69202	0.00027
Elite Cap PC Holdings Inc	HUMBERSTONE CON 2 PT LOTS 23 PT LOT 24 RP 59R6141 PARTS 1 2 PT PART 3	2711-040-004-13401	11.176	7.409	35	16.91815	0	0	16.91815	0.00654
Elite Cap PC Holdings Inc	CON 2 PT LOT 23 PT LOT 24 RP 59R6141 PT PART 6	2711-040-004-13410	10.113	9.878	35	22.55615	0	0	22.55615	0.00654
Elite Cap PC Holdings Inc	CON 2 PT LOT 24 RP 59R10047 PARTS 1 TO 3	2711-040-004-13435	4.016	0.533	35	1.21684	0	0	1.21684	0.00047
Port Colborne Quarries Inc	HUMBERSTONE CON 2 PT LOTS 23 AND 24 RP 59R1037 PARTS 1 TO 4 8 TO 10 RP 59R8010 PART 3	2711-040-004-14000	65.927	3.313	35	7.56578	0	0	7.56578	0.00293
Elite Cap PC Holdings Inc	CON 2 PT LOT 24	2711-040-004-14120	31.214	0.929	35	2.12015	0	0	2.12015	0.00082
Leon Lou Ann M	CON 1 PT LOT 21 RP 59R13013 PART 1	2711-040-004-17902	0.580	0.580	20	0.75727	0	0	0.75727	0.00029
PC City Hall	CON 1 PT LOTS 1-22	2711-040-004-99900	1.603	1.603	80	8.36506	0	0	8.36506	0.00324
PC City Hall	CON 1 PT LOTS 1-22	2711-040-004-99900	1.010	1.011	80	5.27526	0	0	5.27526	0.00204
Matej Dimitrov	CON 3 PT LOT 17	2711-040-005-01700	1.206	0.665	25	1.08427	0	0	1.08427	0.00042
Huffman Audrey Ferne	CON 3 PT LOT 17	2711-040-005-01800	4.752	1.528	35	3.48965	0	0	3.48965	0.00135
Larocque Lucille	CON 3 PT LOT 17	2711-040-005-02301	0.968	0.042	25	0.06835	0	0	0.06835	0.00003
Tice George Edward	CON 3 5 PT LOT 17	2711-040-005-02400	20.160	15.844	35	36.17752	0	0	36.17752	0.01399
Larocque Yvon	CON 3 PT LOT 17	2711-040-005-02500	0.350	0.251	25	0.40944	0	0	0.40944	0.00016
McIntyre David John	CON 3 N PT LOT 17	2711-040-005-03100	18.043	2.845	35	6.49657	0	0	6.49657	0.00251
Fritz Julius	CON 3 PT LOT 18	2711-040-005-04500	24.450	13.612	35	31.08112	0	0	31.08112	0.01202
2023165 Ontario Inc	CON 3 PT LOT 18 RP 59R 4060 PART 1	2711-040-005-04505	0.673	0.673	25	1.09770	0	0	1.09770	0.00042
1374894 Ontario Inc	CON 3 N PT LOT 18	2711-040-005-04700	36.369	36.379	35	83.06773	0	0	83.06773	0.03213
Tsoukalas Harry	CON 3 5 PT LOT 18	2711-040-005-04800	4.163	4.164	35	9.50922	0	0	9.50922	0.00368
Seguin Neil Donald	HUMBERSTONE CON 3 PT LOT 19 RP 59R8914 PT PART 1	2711-040-005-05105	1.145	0.131	25	0.21348	0	0	0.21348	0.00008
Patterson Carrie Elizabeth	CON 3 PT LOT 19 PLAN 59R 8914 PART 2	2711-040-005-05110	0.531	0.492	25	0.80272	0	0	0.80272	0.00031
Milkovich Christopher John	CON 3 PT LOT 19 PLAN 59R 8914 PART 3	2711-040-005-05120	0.531	0.497	25	0.81116	0	0	0.81116	0.00031
De Cicco Carmen	CON 3 PT LOT 19 PLAN 59R 8914 PART 4	2711-040-005-05130	0.531	0.503	25	0.81960	0	0	0.81960	0.00032
Elliott Cory Lyndon	CON 3 PT LOT 19 PLAN 59R 8914 PART 5	2711-040-005-05140	0.531	0.242	25	0.39453	0	0	0.39453	0.00015
2023165 Ontario Inc	CON 3 PT LOT 19 PT LOT 20	2711-040-005-06400	42.374	38.250	35	87.34080	0	0	87.34080	0.03378
Koch Olga	CON 3 LOT 19CPT	2711-040-005-06500	25.612	0.224	25	0.36584	0	0	0.36584	0.00014
Kozelj Stif	CON 3 PT LOT 20	2711-040-005-06600	0.799	0.079	25	0.12911	0	0	0.12911	0.00005
Orsetto Aldo	CON 3 PT LOT 20	2711-040-005-06700	17.057	17.062	35	38.95939	0	0	38.95939	0.01507
Forsey Cynthia Lynn	CON 3 PT LOT 20	2711-040-005-06701	0.186	0.186	25	0.30300	0	0	0.30300	0.00012
Currie Michael Bruce	CON 3 PT LOT 20	2711-040-005-06702	0.195	0.085	25	0.13917	0	0	0.13917	0.00005
Fijavz David	CON 3 PT LOT 20	2711-040-005-06703	2.545	0.334	25	0.54396	0	0	0.54396	0.00021
Levitt Corie	CON 3 PT LOT 20 PLAN 59R 8240 PART 2	2711-040-005-06710	0.405	0.211	25	0.34486	0	0	0.34486	0.00013
Michaud Antonio Abel	CON 3 PT LOT 20 RP 59R8240 PART 1	2711-040-005-06800	4.047	0.271	25	0.44133	0	0	0.44133	0.00017
Henderson David Marshall	CON 3 PT LOT 20	2711-040-005-06801	15.665	15.670	35	35.78006	0	0	35.78006	0.01384
Babion Gail J	HUMBERSTONE CON 3 PT LOT 21	2711-040-005-06900	15.608	15.252	35	34.82546	0	0	34.82546	0.01347
Wagner Dan Patrick	CON 3 PT LOT 21	2711-040-005-07400	4.177	3.050	35	6.96480	0	0	6.96480	0.00269
Stovell David Alan	CON 3 PT LOT 21 59R8535 PARTS 1 TO 3	2711-040-005-07500	2.020	1.238	25	2.01987	0	0	2.01987	0.00078
Sidhu Navreet	CON 3 5 PT LOT 21 5 PT LOT 22	2711-040-005-08100	12.492	7.613	35	17.38373	0	0	17.38373	0.00672
Henderson Drew David	CON 3 PT LOT 22	2711-040-005-08301	2.448	1.055	35	2.40851	0	0	2.40851	0.00093
Beaulieu George E	CON 3 E PT LOT 23	2711-040-005-08900	0.403	0.388	25	0.63234	0	0	0.63234	0.00024
Garner Mark Edward	CON 3 PT LOT 23	2711-040-005-09100	0.379	0.346	25	0.56486	0	0	0.56486	0.00022
Joseph Grandtill	CON 3 PT LOT 23	2711-040-005-09300	0.126	0.082	25	0.13432	0	0	0.13432	0.00005
Stefan John	CON 3 PT LOT 23	2711-040-005-09400	0.152	0.016	25	0.02675	0	0	0.02675	0.00001
Szegedi Zsuzsanna	CON 3 PT LOT 23 RP 59R2123 PART 1	2711-040-005-10100	0.220	0.001						

Table 11 Maintenance Schedule

		Land Area			Watershed				
Owner	Legal Txt	Roll No	Area in Drain	Runoff					
City of Port Colborne	Lorraine Rd From Lake Erie To Killaly St E		3.854	85	21.3719716	0	0	21.37197	0.00827
City of Port Colborne	Lakeshore Rd E From Snider Rd To Lorraine Rd		1.724	85	9.55805144	0	0	9.55805	0.00370
MTO	Highway #3 From Elizabeth St To Babion Rd		2.822	95	17.4908138	0	0	17.49081	0.00676
MTO	Highway #3 From Babion Rd To Weaver Rd		1.948	95	12.07269462	0	0	12.07269	0.00467
MTO	Highway #3 From Weaver Rd To Miller Rd		1.208	95	7.48508306	0	0	7.48508	0.00289
			45.7		252.8	0.0	0.0	252.8	0.0978
			1092.2		2585.6			2585.6	1.0
Bower Drain Branch #1									
JTL Integrated Machine Ltd	CON 1 PT LOT 23 RP 59R13636	\$ 271,104,000,409,801.00	\$ 2.21	\$ 65.00	\$ 9.38	\$ -	\$ -	\$ 9.38	\$ 0.34
City of Port Colborne	59R11175 PART 1 59R11176	\$ 271,104,000,699,500.00	\$ 0.17	\$ 35.00	\$ 0.40	\$ -	\$ -	\$ 0.40	\$ 0.01
Vale Canada Limited	CON 1 PT LOT 23	\$ 271,102,000,718,201.00	\$ 2.60	\$ 65.00	\$ 11.02	\$ -	\$ -	\$ 11.02	\$ 0.40
Schlenger Uszer	CON 1 PT LOT 23	\$ 271,104,000,408,700.00	\$ 3.03	\$ 25.00	\$ 4.94	\$ -	\$ -	\$ 4.94	\$ 0.18
			8.0						
Roads									
City of Port Colborne	Reuter Rd From Lake Erie To Durham St		0.277	85	1.92051	0	0	1.92051	0.06944
			0.3						
			8.3		27.65694			27.65694	1.00000
Wignell Branch Drain #2									
Pace Christopher Alan	CON 1 PT LOT 21	271104000405800	0.1384	25	0.22573	0	0	0.22573	0.00193
Thalen William Douglas	CON 1 PT LOT 21	271104000406300	0.0676	25	0.11026	0	0	0.11026	0.00094
Fahay Kevin Thomas	CON 1 PT LOT 21 RP 59R14550	271104000406400	0.1884	25	0.30728	0	0	0.30728	0.00263
Lagace Raymond Yvon	CON 1 PT LOT 21 RP 59R4325	271104000406500	0.232	25	0.37839	0	0	0.37839	0.00324
Devries Susan Joanna	CON 1 PT LOT 21 RP 59R13702	271104000406600	0.2663	25	0.43434	0	0	0.43434	0.00372
Iovio Gregory Simon	CON 1 PT LOT 21 RP 59R13702	271104000406700	0.3055	25	0.49827	0	0	0.49827	0.00427
Riegle Colleen	CON 1 PT LOT 21	271104000406800	0.3654	25	0.59597	0	0	0.59597	0.00511
Bertulli David Raymond	CON 1 PT LOT 21	271104000406900	0.3944	25	0.64327	0	0	0.64327	0.00551
Pare Robert Laurent	CON 1 PT LOT 21	271104000407000	0.7472	25	1.21868	0	0	1.21868	0.01044
Dunham Traci Lynn	CON 1 PT LOT 21	271104000407100	0.1113	25	0.18153	0	0	0.18153	0.00156
Bears Douglas John	CON 1 PT LOT 21 RP 59R4325	271104000407200	2.7102	35	6.18847	0	0	6.18847	0.05302
Hurkmans Robert William	CON 2 PT LOT 21	271104000409900	12.5466	35	28.64891	0	0	28.64891	0.24545
Vale Canada Limited	CON 2 PT LOT 21 RPS59R3588	271104000410000	10.7611	35	24.57190	0	0	24.57190	0.21052
Sherry Vernob Eugene Martin	CON 2 PT LOT 21	271104000410100	4.0471	35	9.24115	0	0	9.24115	0.07918
Vale Canada Limited	CON 2 PT LOT 21 RPS59R3588	271104000410101	0.121	25	0.19735	0	0	0.19735	0.00169
Rottier Matthew	CON 2 PT LOT 21	271104000410200	0.1517	25	0.24742	0	0	0.24742	0.00212
Dennis Wayne	CON 2 PT LOT 21	271104000410300	0.1824	25	0.29749	0	0	0.29749	0.00255
Huffman John Wayne	CON 2 PT LOT 21	271104000410400	0.1081	25	0.17631	0	0	0.17631	0.00151
Young Tammy Lynn	CON 2 PT LOT 21	271104000410500	0.105	25	0.17126	0	0	0.17126	0.00147
Vollick Ronald Christopher	CON 2 PT LOT 21	271104000410600	0.038	25	0.06198	0	0	0.06198	0.00053
Citrigno Angela	CON 2 PT LOT 21	271104000410700	0.0374	25	0.06100	0	0	0.06100	0.00052
Stark Raymond	CON 2 PT LOT 21 RP 59R4333	271104000410705	2.0105	35	4.59078	0	0	4.59078	0.03933
Elite Capital P.C Developments Inc	CON 2 PT LOT 22	271104000412600	8.6146	35	19.67058	0	0	19.67058	0.16853
Vale Canada Limited	CON 2 PT LOT 22 PT LOT 23	271104000412700	2.4726	35	5.64593	0	0	5.64593	0.04837
			46.7						
Roads									
City of Port Colborne	Killaly St E From Elizabeth St To Lorraine Rd		1.3756	85	7.62825	0	0	7.62825	0.06536
City of Port Colborne	Babion Rd From Killaly St E To Highway #3		0.8521	85	4.72524	0	0	4.72524	0.04048
			2.2						
			49.0		116.7	0.0	0.0	116.7	1.0000
Wignell Branch Drain #3									
Fehrman Paul Allan	HUMBERSTONE CON 2 PT LOT 20	271104000315700	25.1839	35	57.50492	0	0	57.50492	0.74915
Phillips Richard Gordon	CON 2 PT LOT 20 RP 59R-1546	271104000315702	1.3548	25	2.20968	0	0	2.20968	0.02879
Walker William Shawn Robert	HUMBERSTONE CON 2 PT LOT 20	271104000315705	0.9362	25	1.52694	0	0	1.52694	0.01989
Watson Carol Ann	CON 2 PT LOT 20	271104000315900	0.3731	25	0.60853	0	0	0.60853	0.00793
Brodeur Christa Nicole	CON 2 PT LOT 20	271104000316000	0.1245	25	0.20306	0	0	0.20306	0.00265
Lee Derek	CON 2 PT LOT 20	271104000316100	0.3439	25	0.56090	0	0	0.56090	0.00731
Bankert Helen Irene	CON 1 PT LOT 20	271104000317710	1.8461	35	4.21538	0	0	4.21538	0.05492
Quesnelle Andrew	CON 1 PT LOT 20 PLAN 59R	271104000317800	0.582	25	0.94924	0	0	0.94924	0.01237
			30.7						
Roads									
City of Port Colborne	Babion Rd From Killaly St E To Highway #3		0.8469	85	4.69640	0	0	4.69640	0.06118
City of Port Colborne	Killaly St E From Lorraine Rd To Miller Rd		0.4685	85	2.59802	0	0	2.59802	0.03385
City of Port Colborne	Lorraine Rd From Lake Erie To Killaly St E		0.0012	85	0.00665	0	0	0.00665	0.00009
MTO	Highway #3 From Babion Rd To Weaver Rd		0.2711	95	1.68022	0	0	1.68022	0.02189
			1.6						
			32.3		76.8	0.0	0.0	76.8	1.0000

6 Wignell Drain Report Conclusions

This report has identified several drain improvements, including maintenance, to ensure suitable channel design flows are achieved. Based on identified property impacts, the upper drain alignment change is proposed and shown on the plan and profile drawings. A proposed gate automation project will reduce the response time for gate closing and opening settings so that less water flows backward and there is less impediment for water to flow out the outlet.

The following are summary descriptions of the planned improvements:

1. A specific program of improvement for the Wignell Gate Structure has been developed to ensure the gate's continued function to prevent Lake Erie Seiche based flooding events. This includes sluice gate maintenance, replacement of existing motors with actuators, safety and security issues and flow monitoring. The preservation of the existing portable pumping deployment and abandonment of the centrifugal pump former centrifugal pump arrangement are identified.
2. Re-alignment of the drain above STA 5+978 to accommodate future PCQ expansion. The quarry properties that benefit from this re-alignment are paying most of the costs of the proposed work. A portion of the costs is allocated for utility relocation to be paid by the utility affected.
3. A maintenance program of vegetation removal and re-grading to design grade and channel geometry (trapezoidal cross-section) from 2+450 to 4+700. Culvert replacement at 4+200 with a 50/50 cost split on standard length. Channel cleaning is assessed as a Section 23 benefit.
4. A maintenance program of spot vegetation removal and basic maintenance from STA 0+600 to 2+450.
5. Previous erosion protection works started in 2006 and completed in 2007 were assessed as a Section 24 Special Benefit for costs to the three adjacent landowners as a 14% benefit. The remainder is assessed as a Section 23 Outlet Liability benefit to the upstream landowners in the watershed.
6. A proposed Bank Restoration Improvement Program (BRIP) is included for one subscriber property, but other properties can be included by agreeing to the same cost-sharing principles. This uses natural methods to reconstruct a bank to resist future stream bank erosion as an alternative to the concrete block wall constructed in 2006/2007.