



**ENGINEERING AND OPERATIONS DEPARTMENT
ENGINEERING DIVISION**

Report Number: 2012-3

Date: January 16, 2012

**Subject: COMBINED SEWER OVERFLOW (CSO) MANAGEMENT PLAN
2012 APPLICATION FOR FUNDING**

1) PURPOSE:

This report is prepared by Jim Huppunen, Manager of Engineering Services under the permission of Ron Hanson, Director of Engineering and Operations to confirm, by Resolution of Council, the Municipality's application for funding with the Region of Niagara's CSO Management Action Plan and the City's commitment of \$406,000 from the 2012 Sanitary Sewer Capital Budget allocation.

2) HISTORY, BACKGROUND, COUNCIL POLICY, PRACTICES

The Niagara Water Strategy was released in 2003, resulting in the establishment of the CSO Management Action Plan. Combined sewer overflows (CSO) are one of the highest point source contributors of contaminants to receiving water bodies from urban areas. The CSO Plan represents the first step in a 15 year program to achieve CSO reductions targets in Niagara. The City was successful in acquiring matching funds (50 %) in each year between 2007 and 2011.

In conjunction with the Region, the Port Colborne Pollution Control and Infrastructure Study was completed in 2006. The study identified existing CSO locations and sources of extraneous flow contributing to the problem. As a result of the study, recommendations for source control in key areas have been identified. As detailed in the Strategic Planning sessions and at Budget deliberations, Staff presented a proposed Pilot Program for the Arena Sewershed, with an allocation of \$400,000 for 2007/2008. In 2009 a similar program was proposed for the Omer Sewershed with an allocation of \$200,000 for 2009, 2010 and 2011 respectively. Since it is anticipated that the funding program will continue in future years, the plan is to continue applying for funding for additional source control programs on a City-wide basis.

3) STAFF COMMENTS AND DISCUSSIONS

The results of source control measures will be lower treatment costs to the Municipality, reduced capital costs to the Region for pumping station and treatment plant upgrades and additional capacity for future development connecting to the system.

As Council will recall, a report and presentation outlined the success of the Pilot Program for the Arena Sewershed at the November 28, 2011 Council meeting. The source control program in the Arena area is complete with further works ongoing in the Omer Sewershed. The City's Sewer Use Bylaw was adopted by Council in December 2008. A report to Council on the findings and planned remediation for the Omer Area was also presented at Council on November 28, 2011.

A capital fund allocation of \$200,000 is currently built into the sewer rate structure and has been for a number of years. This allocation does not impact an increase to the current rate. The allocation of these funds effectively doubles the available capital funds for ongoing projects in 2012 with matching funds from the Region. There are a number of sewer enhancement projects and storage improvement projects which may be funded through this program. With the debenture of the Stonebridge Drive sanitary sewer construction maturing in 2012, an additional \$206,000 from the current sewer rate structure is available for capital works projects. A total of \$406,000 in capital funds is available in 2012 with matching Regional funds.

With the Pilot Program complete and the Omer Area program progressing with previously allocated funds, Staff recommends starting a rehabilitation program in the Nickel Sewershed. Based on current information and from previous investigations, the Nickel Sewershed is the next logical area to remediate to reduce the inflow and infiltration to the City's sanitary sewers.

The estimated cost for the remediation of the Nickel Sewershed is estimated to be \$1,130,700 which \$812,000 would be eligible for 50% matching funds from the Region. With the \$406,000 currently available in the Wastewater budget for 2012, Staff recommends applying for \$406,000 in funding from the Region of Niagara to match the City's allocated funds. Under the current Region of Niagara CSO Policy the remaining funds of \$318,700 are not eligible for 50% funding and the City will be responsible for 100% of the private property rehabilitation works. The total share for the City's portion is \$724,700. The bulk of the inspections and remediation work to provide outlets for the sump pump connections will utilize the majority of the 2012 construction season with additional work continuing into 2013 for the private property works. It will be recommended that the 2013 project be funded in the same manner with current capital funding of the sewer rate structure. In addition, we continue to request the Region, by motion, to review their CSO funding policy to include private property works.

4) OPTIONS AND FINANCIAL CONSIDERATIONS:

a) Do nothing.

The cost of doing nothing would be the loss of 50 % funding on the program.

b) Other Options

As outlined, the CSO Management Plan guidelines require that municipalities apply on an annual basis for funding. The deadline is January 20, 2012. This is recommended to take advantage of other available funding.

5) COMPLIANCE WITH STRATEGIC PLAN INITIATIVES

Not applicable.

6) ATTACHMENTS

1. 2012 Region of Niagara CSO Policy Funding Application Form
2. 2012 CSO Resolution

7) RECOMMENDATION

That the Council of the City of Port Colborne, by Resolution, support the Application for Funding to the Region of Niagara, for the CSO Management Action Plan, and further; that Council confirm the 2012 Wastewater budget allocation of \$406,000 for the Source Reduction Program.

8) SIGNATURES

Prepared on January 5, 2012 by:

Reviewed by:

Jim Hupponen, A.Sc.T.
Manager of Engineering Services

Ron Hanson, C.E.T.
Director of Engineering & Operations

Reviewed by:

Reviewed and Respectfully Submitted:

Peter Senese
Director of Corporate and Community
Services

Robert J. Heil
Chief Administrative Officer

REGION OF NIAGARA
Combined Sewer Overflow (CSO) Policy
Funding Application Form

Funding Application

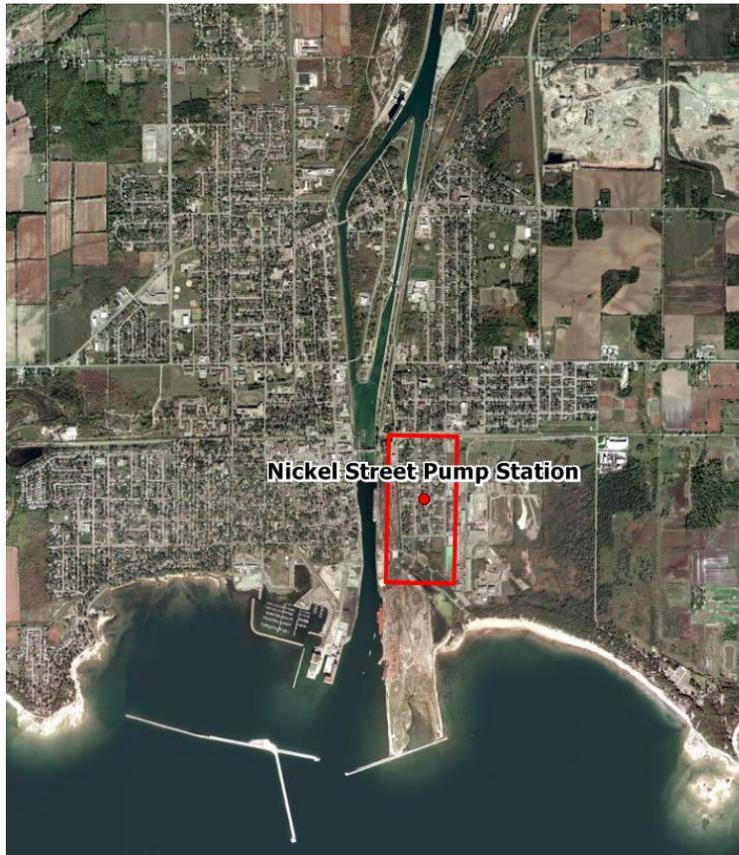
Section 1: Applicant Information

Project Name: City of Port Colborne Nickel Area Extraneous Flow Reduction Program
Application Prepared by: Ron Hanson, C.E.T., Director of Engineering and Operations
Municipality/Agency: City of Port Colborne
Department: Engineering and Operations
Project Manager/Lead Contact: Ron Hanson, C.E.T., Director of Engineering and Operations

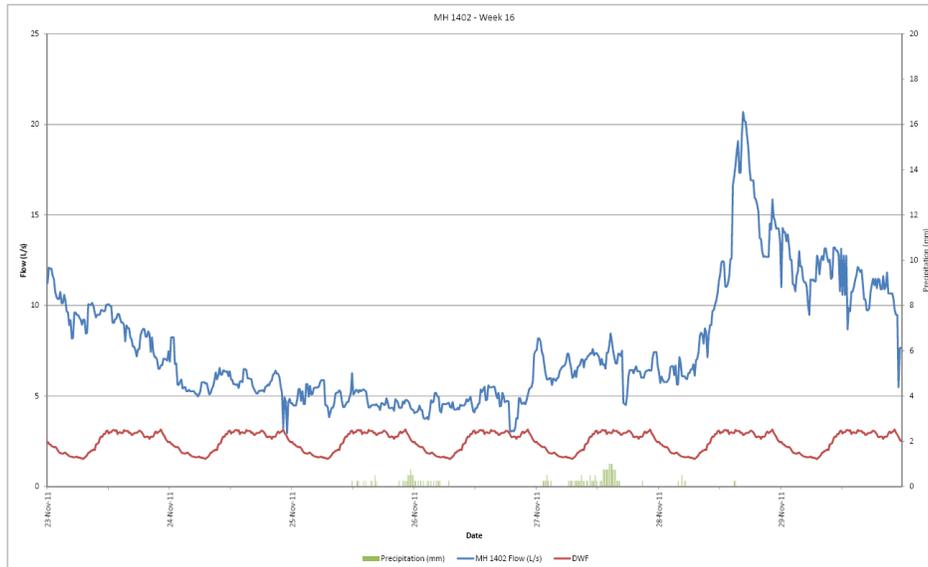
Section 2: Project Information

1. Describe the project location and attach map.

This project is focused on the area tributary to the Nickel Street Pumping Station, as illustrated by the figure below. The Nickel Street PS catchment area is approximately 140 ha and includes approximately 315 private properties, most of which are residential with some commercial and industrial properties located on the North and East limits of the drainage area.



The flow from the Nickel Street PS is conveyed directly to the wet well of the East Side PS via a 300mm forcemain. The Nickel area consistently exhibits inordinately high peak wet weather flows during precipitation events. Recent flow monitoring in this area confirms that the extraneous flow in the area has a significant inflow versus infiltration component. This is illustrated via the following figure which shows a 500% increase in flow for what could be classified as a minor to moderate precipitation event:



The drainage area tributary to the flow data shown constitutes approximately 50% of the total area tributary to the Nickel PS.

This area was identified as a high priority focus area in the Region of Niagara’s Master Servicing Plan Update, completed in 2003 by MacViro Consultants, and the City of Port Colborne’s Pollution Control and Infrastructure Study, completed in 2007 by XCG Consultants for the elimination of inflow and infiltration.

Recommended CSO reduction measures for this area and the East Side Pump Station area include:

- Conduct an on lot survey for the disconnection of private property sources already identified and to identify and remediate additional sources
- Replace three existing 58.3 L/s pumps at Nickel Street PS with three new 60 L/s pumps, (over 25 years)
- Replace three existing 205 L/s pumps at the East Side PS with three new 245 L/s pumps (over 25 years)
- Construct a 2,500 metre cubed CSO storage tank upstream of Nickel Street PS, (0-10 years)
- Construct a 140 metre cubed CSO storage tank upstream of East Side PS, (0-10 years)

The above recommended remedial works further illustrate the need for a Nickel PS area specific and systematic inflow and infiltration reduction program to defer capital expenditures, free up development capacity within the area prior to the implementation of the East Waterfront Community Improvement Plan, (CIP).

The East Waterfront CIP involves the improvement and restoration of both public and private property in the area defined in the following graphic. The CIP area directly coincides with that of the Nickel Street PS with the exception of developable lands to the South that are not currently within the current wastewater service area.

The East Waterfront CIP is intended to attract significant investment and development in this lakefront area adjacent to the Nickel Beach recreation area through:

- The repair and renovation of existing houses and commercial buildings
- Restoration of and reuse of historically significant buildings
- Improve the quality of streetscapes in the neighbourhood
- Reduce the environmental and visual impact of industrial uses
- Create new open spaces and recreational opportunities
- Improve pedestrian and cycling connections to Nickel Beach and the lake generally
- Establish more attractions at Nickel Beach
- Protect and enhance the significant natural features of the lakefront



It is therefore essential given the pressure for additional / denser development, additional service area and the proposed streetscape improvements that any and all activities with respect to the optimization of the wastewater system tributary to the Nickel Street PS be performed in the short term. This will both free up capacity within the existing system for additional development, deferral of capital expansion costs, while avoiding any potential conflicts with proposed building and local infrastructure improvements. The proposed project is also consistent with the preferred Environmental outcomes of the CIP.

2. Project type (storage, separation, study, etc.) and description.

The City of Port Colborne is committed to eliminating all sources of Inflow and Infiltration (I&I) whether within the municipal right of way, or on private property, and has consistently reserved an annual budget of \$200,000 for capital works related to I&I and therefore CSO reduction. This program, funded by the Region and the City involves the systematic identification and remediation of sources of inflow and infiltration and the measurement of the beneficial impact via source quantification and in sewer area velocity metering pre and post rehabilitation.

In 1992, the City of Port Colborne undertook a city-wide house to house survey to identify sources of I/I on private property. This survey indicated that of the approximately 315 private properties serviced by the Nickel St. PS, at least 100 properties currently discharge foundation drains via sump pump to the sanitary sewer. The attached mapping, “Nickel Area – I/I Reduction Program” illustrates the extent of the connections to the sanitary and the potential discharge locations based on local topography, local storm infrastructure and building orientation.

Field investigation conducted in conjunction with the City’s on-going I&I programs indicates that the majority of sump pumps in use are 1/4 hp, which typically results in a continuous flow rate of 15-20 USGPM (0.95-1.26 L/s) at 2 metres of head (Myers ¼ hp pump curve). The sump pumps

identified in the 1992 House to House Survey are assumed to contribute extraneous flow at a peak discharge of approximately:

$$100\text{-}1/4 \text{ hp sump pumps} \times 0.95 \text{ L/s} = \underline{95 \text{ L/s}}$$

The 2007 Pollution Control Plan indicates that the rated capacity of the Nickel St. PS is 116 L/s.

It is the City's objective to disconnect each and every private property source from the sanitary sewer, and redirect all to a suitable storm drainage outlet, however there are several major impediments to moving the disconnection program forward:

- The study area is a densely built up neighbourhood, few of the properties have adequate space, or grade to provide positive surface drainage, making it impossible to redirect foundation drains from the sanitary sewer to the surface without causing surface flooding on adjacent properties.
- Surface discharge of sump pumps without free and unfettered outlets will lead to surface ponding and ice accumulation on areas surrounding the properties in the winter months. This could negatively impact city operations from a liability perspective.
- The inventory and connectivity of storm sewer system is not well understood.
- The adequacy from both hydraulic and serviceability perspectives of the local storm system and outlet to accept the flows as stated is at this point unknown.

This project is the continuation of the City's commitment to extraneous flow elimination and sewer separation with the objective being the elimination of extraneous flow in the Nickel PS area sanitary sewer via the following two year work program:

1. The hydraulic and condition assessment of local stormwater infrastructure to ensure its adequacy for conveying private property sources of extraneous flow already identified.
2. Provide a conceptual and detailed design for the construction, in the municipal right of way, for a collection system to allow for the disconnection of private property source of extraneous flow including but not limited to the approximately 100 sump pumps identified as discharging to the sanitary sewer in the Nickel area.
3. Verify and augment the current understanding of the sources of extraneous flow on private and public property.
4. Construction of all necessary storm infrastructure within the right of way to allow for the redirection of extraneous flow sources.
5. Condition assessment of the existing Nickel PS area sanitary sewer system for the identification of any and all sources of extraneous flow.
6. Pre and post remediation determination of hydraulic and financial beneficial impact of the program via a detailed flow monitoring program.
7. Production of a comprehensive report outlining the results of the program.

Detailed post rehabilitation monitoring will be carried out to quantify the reduction in extraneous flow in the defined program area. The program will also include a comprehensive public education program to clearly outline to program area residents the impact of extraneous flow sources from environmental, financial and legislative perspectives. The City will leverage existing materials from a previous study for the public education program.

3. Confirm that the project is based on a recommendation from the current CSO study report for your municipality. Summarize the recommendation.

The Region of Niagara’s Master Servicing Plan Update, completed in 2003 by MacViro Consultants, and the City of Port Colborne’s Pollution Control and Infrastructure Study, completed in 2007 by XCG Consultants, recommend on-going Inflow and Infiltration Reduction investigation and rehabilitation works. These reports recommended the following specific remedial actions for the Nickel St. PS area:

- Construct a 2,500m³ CSO Storage tank upstream of Nickel St. PS at an estimated cost of \$1,080,000 (2003 MSP, p. 13-51)
- Complete on-lot surveys of all private properties (approximately 104 of 315 properties in the Nickel St. PS area were not inspected as part of the 1992 House to House Survey)

With funding from the Region of Niagara’s 2008 CSO policy budget, the City of Port Colborne initiated its Pilot Inflow and Infiltration Reduction Program which focused on the area tributary to the Arena Pumping Station. The Arena Area Pilot I&I Program was completed in November 2011 and resulted in the elimination of 37 points of active infiltration within the City’s sewers, and the disconnection of 16 private property sump pumps from the sanitary sewer. The flow monitoring and analysis conducted as part of the Arena I&I program indicated that the sewer repairs and sump pump disconnections have resulted in a reduction in extraneous flow equivalent to \$115,000 in annual treatment costs. On a City-wide basis, it is estimated that the treatment cost associated with extraneous flow is roughly \$1 to \$1.2 Million annually.

This project is intended to build on the measurable successes in both the Arena and Omer PS area.

4. Provide the estimated reduction in CSO overflow volume (in cubic metres) for the average year (7 month disinfection season) and provide the basis of that estimate.

Based on preliminary flow monitoring, the study area exhibits an average infiltration coefficient of 16% (7%-30%), for a total rainfall of 212mm. Port Colborne typically experiences approximately 1000mm total precipitation annually, which given the preliminary flow monitoring results, would result in an extraneous flow volume of approximately 75,000 to 100,000 m³ annually.

5. Indicate an estimate of the frequency of overflows in an average year (7 month disinfection season) and provide the basis of that estimate.

- Overflows occur at least once per year
- Overflows occur at least once every 2 years
- Overflows occur at least once every 3 years or more

The Nickel St. PS is not equipped with an overflow. The East Side PS, which receives flow from the Nickel St. PS, has a gravity overflow that discharges to the Welland Canal. Given that these

pumping stations are Regional facilities, the City of Port Colborne is not in possession of overflow records.

6. Indicate an estimate of the frequency of overflows in an average year (7 month disinfection season) and provide the basis of that estimate.

- Within 8 kilometres of a beach
- Between 8-16 kilometres of a beach
- Greater than 16 kilometres of a beach

7. Identify the nature and name of the receiving water(s).

- Estuarine and wetland
- Lakes and Ponds
- River
- Stream

The Nickel St. PS is not equipped with an overflow. The East Side PS, which receives flow from the Nickel St. PS, has a gravity overflow that discharges to the Welland Canal.

8. Provide the distance from the CSO discharge point to a drinking water intake.

- Within 8 kilometres
- Between 8 and 16 kilometres
- Greater than 16 kilometres

9. Does the CSO discharge into fish habitat according to the NWQPS?

- Critical Fish Habitat
- Important Fish Habitat
- Marginal Fish Habitat

10. Provide the estimated total project cost and the sub-total for each phase (EA, design, construction, etc.). Note the Region will only fund in progress or proposed work and not work that has been completed.

The total estimated cost for the program is indicated below by project component. Those costs that are not eligible have been clearly indicated in the interest of transparency. No works involving private property other than identification / confirmation of private property extraneous flow sources has been submitted for subsidy.

Project Summary		
Task	Description	Estimated Cost
1	Public Education Program	\$ 16,200
2	Storm Sewer Servicing - Planning	\$ 150,600
3	Storm Sewer Servicing - Implementation in ROW	\$ 617,100
4	Storm Sewer Servicing - Private Property Separation	\$ 318,700
5	Flow Monitoring - Post Separation	\$ 28,100
Project Total		\$ 1,130,700
Private Property Components Not Eligible for Funding		\$ 318,700
Total Regional Funding Requested		\$ 406,000
Total Funding by City of Port Colborne		\$ 724,700

The City of Port Colborne has reserved \$ 406,000 for the 2012 budget year for this project with the traditional capital commitment of approximately \$200,000 for the 2013 budget year. It is assumed that economies of scale can be achieved in the private property disconnection components of the program to better align project costs with available funding.

The City of Port Colborne is therefore requesting \$406,000 in matching funds for the purposes of this application.

11. Describe the flow monitoring program which will assess project effectiveness including cost estimate or provide reason for not doing flow monitoring.

The flow monitoring program will include monitoring at multiple sites in the drainage area to allow for both the detailed examination and quantification of existing and post retrofit or repair conditions. The flow monitoring period will be six months under existing conditions and six months under “post-separation” conditions. The flow monitoring will permit the City to assess the overall effectiveness of the project from both financial and logistical perspectives by providing flow data both before and after retrofits to eliminate extraneous flows from the sewer system.

12. Provide an implementation schedule for the project.

It is anticipated that this program will be initiated upon funding award and be carried out over a period of 24 months.

13. Confirm your Municipal Council’s commitment to the proposed project and attach a copy of the appropriate Council resolution and/or budget confirmation.

A resolution of Council of the City of Port Colborne is attached indicating a total funding commitment of \$406,000 for this year.

14. Identify any third party funding (e.g. federal/provincial) for the project and confirm that the proposed cost sharing between the Region and local municipality is net of this other funding. Is there a third party funding completion deadline?

No third party funding is available for this project.

15. Is the project subject to standing or pending orders by the Ministry of the Environment for Area Municipal compliance? If yes, describe the conditions of the order.

Yes. The Ministry of Environment has expressed concern with the high levels of I/I in the City of Port Colborne, and has mandated that the City and stakeholders address and demonstrate significant I/I reduction by 2013. If the required I/I reduction is not achieved, construction of CSO storage will be ordered by the Ministry of Environment.

Please forward all completed electronic/hardcopy applications and inquiries to:

Danielle Anders, M.A.Sc.,P.Eng
Project Manager
Regional Municipality of Niagara, Public Works Dept.
Water & Wastewater Services Division,
Environmental Centre
3501 St. David's Road
PO Box 1042, Thorold, ON, L2V 4T7
Phone: 905-685-4225 ext. 3205
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City of Port Colborne

DATE: January 16, 2012

MOVED BY COUNCILLOR

SECONDED BY COUNCILLOR

That the Council of the City of Port Colborne, by Resolution, support the Application for Funding to the Region of Niagara, for the CSO Management Action Plan, and further; that Council confirm the 2012 Sanitary Sewer budget allocation of \$406,000 for the Source Reduction Program.

MAYOR
Vance M. Badawey