



The Corporation of the City of Stratford
Infrastructure, Transportation and Safety Committee
Open Session
AGENDA

Date: Monday, May 10, 2021

Time: 3:05 P.M.

Location: Electronic Meeting

Committee Present: Councillor Burbach - Vice Chair Presiding, Councillor Vassilakos - Chair, Mayor Mathieson, Councillor Beatty, Councillor Bunting, Councillor Clifford, Councillor Gaffney, Councillor Henderson, Councillor Ingram, Councillor Ritsma, Councillor Sebben

Staff Present: Joan Thomson - Chief Administrative Officer, Tatiana Dafoe - City Clerk, Taylor Crinklaw - Director of Infrastructure and Development Services, Ed Dujlovic, David St. Louis - Director of Community Services, John Paradis - Fire Chief, Kim McElroy - Director of Social Services, Anne Kircos - Acting Director of Human Resources, Chris Bantock - Deputy Clerk

To watch the Committee meeting live, please click the following link: <https://stratford-ca.zoom.us/j/86204058943?pwd=dm5uZGRuOVhYYVJWUEx5cHF4am8ydz09>

A video recording of the meeting will also be available on the [City's website](#) following the meeting.
Pages

1. Call to Order

The Vice-Chair to call the Meeting to Order.

2. Disclosure of Pecuniary Interest and the General Nature Thereof

The *Municipal Conflict of Interest Act* requires any member of Council declaring a pecuniary interest and the general nature thereof, where the interest of a member of Council has not been disclosed by reason of the member's absence from the meeting, to disclose the interest at the first open meeting attended by the member of Council and otherwise comply with the *Act*.

Name, Item and General Nature of Pecuniary Interest

3. Sub-committee Minutes

7 - 15

Sub-committee minutes are attached for background regarding the discussion held at the April 28, 2021 Sub-committee meeting.

4. Delegations

None scheduled.

5. Report of the Acting Director of Infrastructure and Development Services

5.1. Proposed Closure of T. J. Dolan Drive from Centre Street to St. David Street (ITS21-014)

16 - 28

Correspondence was received from James Colbeck and is attached to this agenda for consideration by Committee. Residents Jane Marie Mitchell and Patrick O'Rourke have requested to address Committee on this matter.

Motion by _____

THAT Jane Marie Mitchell and Patrick O'Rourke be heard.

Motion by _____

THAT the correspondence from James Colbeck dated March 3 and May 2, 2021 regarding the proposed closure of T.J. Dolan Drive from Centre Street to St. David Street be received.

Motion by _____

Staff Recommendation: THAT T.J. Dolan Drive between St. David Street and Centre Street be closed and converted to a multi-use trail.

5.2. Passive House Standards and Net Zero Ready Homes (ITS21-011)

29 - 51

Staff Recommendation: THAT the development of a green standards policy, including the development of programs to offset associated costs such as a reduction in development charges or property tax relief, be referred to the 2022 budget.

Motion by _____

Sub-committee Recommendation: THAT the development of a green standards policy, including the development of programs to offset associated costs such as a reduction in development charges or property tax relief, be referred to the 2022 budget.

6. Report of the Manager of Environmental Services

6.1. Update of Sewer Policy S.1.8 and Sewer Policy S.1.10 (ITS21-012)

52 - 60

Staff Recommendation: THAT Sewer Policies S.1.8 and S.1.10 are updated to reflect new wording outlined in Report (ITS21-012) that will help eliminate policy misinterpretation from the public.

Motion by _____

Sub-committee Recommendation: THAT Sewer Policies S.1.8 and S.1.10 are updated to reflect new wording outlined in Report (ITS21-012) that will help eliminate policy misinterpretation from the public.

6.2. Resolution - 2020 Stratford Water Pollution Control Plant Annual Report (ITS21-013) 61 - 128

Staff Recommendation: THAT the 2020 Stratford Water Pollution Control Plant Annual Report be received for information to ensure transparency between the owner and operating authority.

Motion by _____

Sub-committee Recommendation: THAT the 2020 Stratford Water Pollution Control Plant Annual Report be received for information to ensure transparency between the owner and operating authority.

7. Report of the Events Coordinator

7.1. Request for Exemption from Noise Control By-law 113-79 for The HUB Stratford's five-year anniversary (ITS21-010) 129 - 134

Staff Recommendation: THAT approval be given to the request from The HUB Stratford for an exemption to the Noise Control By-law 113-79 for their five-year anniversary event held at 31 Market Place on Thursday, July 1, 2021 from 2:00 p.m. to 10:00 p.m. from the following provisions:

- Unreasonable noise [Schedule 1 clause 8]
- The operation of loudspeakers and amplification of sound [Schedule 2 Clause 2]
- The operation or use of musical instruments [Schedule 2 Clause 17], and,

subject to applicable Provincial Orders and Public Health Guidelines in place at that time.

Motion by _____

Sub-committee Recommendation: THAT approval be given to the request from The HUB Stratford for an exemption to the Noise Control By-law 113-79 for their five-year anniversary event held at 31 Market Place on Thursday, July 1, 2021 from 2:00 p.m. to 10:00 p.m. from the following

provisions:

- Unreasonable noise [Schedule 1 clause 8]
- The operation of loudspeakers and amplification of sound [Schedule 2 Clause 2]
- The operation or use of musical instruments [Schedule 2 Clause 17], and,

subject to applicable Provincial Orders and Public Health Guidelines in place at that time.

8. For the Information of Committee

8.1. Capital Project Update

135 - 137

Sub-committee Discussion: The Director of Infrastructure and Development Services advised that most capital construction projects completed in 2020 have started final restoration work such as soil repairs and minor construction repairs.

The Queen Street storm trunk sewer open house will be available online for area residents to review and provide comments. It was noted that the electronic open houses have been received well.

Staff are working with Canada Post to adjust mailbox locations on O'Loane Avenue.

The asphalt resurfacing open house will be online soon, with tendering in spring and construction in the summer. This includes portions of Romeo Street North and South.

The main sidewalk projects for the year are on West Gore from St. Vincent to John and Mornington from McCarthy to Graff. Design is ongoing, tenders will go out in a month.

T.J. Dolan Multi-use trail tenders are in and staff are reviewing and waiting on funding announcements.

Planning is dealing with over 20 formal consultations at this time.

Staff are proceeding with a pilot project to use a small robot for sidewalk inspections.

Hydrant flushing is ongoing and Public Works is almost complete with the first round of street sweeping and sod damage repairs.

In response to a question regarding the John Street dam, the Manager replied that there was quite a bit of debris where the overflow meets the

dam. UTRCA staff cleaned most of it out and City staff removed larger items.

A concern from a resident experiencing discoloured water for multiple days was noted. The Manager stated that the spring flush is worse than the fall flush as there is a longer period between flushes and condition of the water mains and high iron content of the water continues to be a problem. A uni-directional flushing program will be piloted in fall of 2021 which will hopefully mitigate some of the discolouration issues.

The remainder of the status update will be listed on the May 10, 2021 Infrastructure, Transportation and Safety Committee agenda.

8.2. Lakeside Drive

Sub-committee Discussion: The Vice-Chair advised resident concerns had been received regarding speeding on Lakeside Drive, safety of swans and unsafe operation of motorbikes. She inquired as to the status of an outstanding report on some of these issues. She also inquired about making Lakeside Drive a one-way street with the other lane to be used as a multi-use trail.

Mr. Dujlovic responded that the report is on the list, however, staff shortages have put them a bit behind. He also advised that speeding or other traffic complaints should be reported to the police, who recently advised they would increase enforcement in the area. The difficulty of modifying people's behavior and the need to consult with the Festival if temporary road closures in the area will be considered again this summer were discussed.

Sub-committee Decision: THAT staff report back at the May Infrastructure, Transportation and Safety Sub-committee meeting on how temporary road closures on Lakeside Drive went in 2020, consult with the Festival and provide potential options for summer of 2021.

8.3. Garbage and Recycling on Forman Avenue

Sub-committee Discussion: The Chair inquired on the status of adding more garbage and recycling bins along Forman Avenue. Mr. Dujlovic advised that the school was having students pick up garbage and it seemed to be improving.

He suggested that the Director follow up with the Supervisor of Public Works to review and locate some garbage and/or recycling receptacles.

It was suggested that the church would be a good place to locate bins.

8.4. Advisory Committee/Outside Board Minutes

138 - 154

The following Advisory Committee/Outside Board minutes are provided for the information of Committee:

- Accessibility Advisory Committee minutes of March 2, 2021
- Active Transportation Advisory Committee (ATAC) minutes of February 24, 2021
- Energy and Environment Committee minutes of March 4, 2021

9. Adjournment

Meeting Start Time:

Meeting End Time:

Motion by _____

Committee Decision: THAT the Infrastructure, Transportation and Safety Committee meeting adjourn.



The Corporation of the City of Stratford Infrastructure, Transportation and Safety Sub-committee MINUTES

Date: April 28, 2021
Time: 3:30 P.M.
Location: Electronic Meeting

Sub-committee Present: Councillor Burbach - Vice Chair Presiding, Councillor Vassilakos - Chair, Councillor Gaffney, Councillor Ingram, Councillor Sebben

Staff Present: Taylor Crinklaw - Director of Infrastructure and Development Services, John Paradis - Fire Chief, Ed Dujlovic, Jodi Akins - Council Clerk Secretary, Allison Jordan - Events Coordinator, Chris Bantock - Deputy Clerk, Johnny Bowes - Manager of Environmental Services

Also present: Members of the Public

1. Call to Order

The Vice-Chair called the meeting to order.

2. Disclosure of Pecuniary Interest and the General Nature Thereof

The *Municipal Conflict of Interest Act* requires any member of Council declaring a pecuniary interest and the general nature thereof, where the interest of a member of Council has not been disclosed by reason of the member's absence from the meeting, to disclose the interest at the first open meeting attended by the member of Council and otherwise comply with the *Act*.

Name, Item and General Nature of Pecuniary Interest

No disclosures of pecuniary interest were made by a Member at the April 28, 2021 Infrastructure, Transportation and Safety Sub-committee meeting.

3. **Delegations**

None scheduled.

4. **Report of the Events Coordinator**

4.1 **Request for Exemption from Noise Control By-law 113-79 for The HUB Stratford's five-year anniversary (ITS21-010)**

Staff Recommendation: THAT approval be given to the request from The HUB Stratford for an exemption to the Noise Control By-law 113-79 for their five-year anniversary event held at 31 Market Place on Thursday, July 1, 2021 from 2:00 p.m. to 10:00 p.m. from the following provisions:

- Unreasonable noise [Schedule 1 clause 8]
- The operation of loudspeakers and amplification of sound [Schedule 2 Clause 2]
- The operation or use of musical instruments [Schedule 2 Clause 17], and,

subject to applicable Provincial Orders and Public Health Guidelines in place at that time.

Sub-committee Discussion: The Events Coordinator reviewed the request from the applicant. She noted that the request pertains to an event to be held on their rooftop patio on July 1, 2021 from 2:00 to 10:00 p.m.

Letters advising of the proposed event were sent to surrounding property owners. Notice was also posted in the Town Crier and no comments were received.

The event will have live performers, amplification and instruments and the clauses from the noise by-law for which the applicant is requesting an exemption were reviewed. It was also noted that this approval would be subject to applicable Provincial orders and public health guidelines at that time.

In response to whether the City was planning any Canada Day events, the Events Coordinator advised that talks are under way regarding a virtual event.

Motion by Councillor Sebben

Sub-committee Recommendation: THAT approval be given to the request from The HUB Stratford for an exemption to the Noise Control By-law 113-79 for their five-year anniversary event held at 31 Market Place on Thursday, July 1, 2021 from 2:00 p.m. to 10:00 p.m. from the following provisions:

- Unreasonable noise [Schedule 1 clause 8]
- The operation of loudspeakers and amplification of sound [Schedule 2 Clause 2]
- The operation or use of musical instruments [Schedule 2 Clause 17], and,

subject to applicable Provincial Orders and Public Health Guidelines in place at that time.

Carried

5. Report of the Acting Director of Infrastructure and Development Services

5.1 Passive House Standards and Net Zero Ready Homes (ITS21-011)

Staff Recommendation: THAT the development of a green standards policy, including the development of programs to offset associated costs such as a reduction in development charges or property tax relief, be referred to the 2022 budget.

Sub-committee Discussion: Mr. Dujlovic advised that this report was prepared in response to a motion from the Energy and Environment Committee. The Committee requested that staff look into implementing Net Zero Ready homes and offering a reduction of development charges and/or property taxes to offset upfront costs to the developers.

Sub-committee members were advised the report reviews what is involved in constructing a Net Zero Ready home, such as triple glazing windows, insulation and being ready to accept solar panels. It was stated that the City cannot require builders to do this, as they must adhere to the Ontario

Building Code. If improvements to the Code are wanted, the Energy and Environment Committee must lobby the Provincial government.

Mr. Dujlovic advised the federal government completed a study, which was attached to the report, on Net Zero Homes and some of the challenges were noted, such as lack of contractors who are qualified to build these homes.

Toronto and Whitby have adopted voluntary standards. The additional costs to build to these standards were noted. With respect to finances, staff looked at average taxes for new home builds and current development charges for single family homes and came up with a potential \$2,000 grant amount. Staff also identified the need to meet with local area builders.

Discussion took place regarding setting passive housing as a goal, noting that it is a lofty long-term goal, however, introducing a tiered system could ensure that requirements could shift over time towards the net zero goal. In response to whether the City has the staff capacity to develop green development standards, Mr. Dujlovic advised that several things need to be looked at, including available staff, public outreach and additional costs.

Motion by Councillor Vassilakos

Sub-committee Recommendation: THAT the development of a green standards policy, including the development of programs to offset associated costs such as a reduction in development charges or property tax relief, be referred to the 2022 budget.

It was noted that financial costs and return on investment may not be the driver of this project, but reduction of greenhouse gases could be. It was suggested that having a tiered system would allow the City to move quickly in the future. It was also noted that discounts given are paid for by the taxpayers or as a result of programming reductions.

The Vice-Chair called the question on the motion on the floor.

Carried

6. Report of the Manager of Environmental Services

6.1 Update of Sewer Policy S.1.8 and Sewer Policy S.1.10 (ITS21-012)

Staff Recommendation: THAT Sewer Policies S.1.8 and S.1.10 are updated to reflect new wording outlined in Report (ITS21-012) that will help eliminate policy misinterpretation from the public.

Sub-committee Discussion: The Manager of Environmental Services advised that several policies were put in place in December 2020 regarding sanitary service subsidies. The policies are working well and the program has been used several times, however, staff want to clarify a few sections of the policies as they were misinterpreted by the public. The changes in wording were outlined by the Manager as stated in the report.

In response to whether problems with older homes having shared public drain connections occurred on Redford Crescent, Ed replied that it typically occurs in older neighbourhoods where the homes are up to 100 years old.

It was asked whether there was a map outlining where shared sanitary service laterals are located. The Manager responded that there are some residences identified, however, there is no repository of information for all properties in town. It is typically identified when there are back-ups in homes.

Discussion took place regarding whether property owners would need to disclose the servicing information when selling homes and whether there was any chance of the City being involved. The Manager confirmed that typically the situations are on private property and are up to the owners to negotiate, although the City is available to provide guidance.

The Manager outlined the second portion of the report that deals with the percentage of costs covered by the City during re-lining projects.

Motion by Councillor Gaffney

Sub-committee Recommendation: THAT Sewer Policies S.1.8 and S.1.10 are updated to reflect new wording outlined in Report (ITS21-012) that will help eliminate policy misinterpretation from the public.

Carried

6.2 Resolution - 2020 Stratford Water Pollution Control Plant Annual Report (ITS21-013)

Staff Recommendation: THAT the 2020 Stratford Water Pollution Control Plant Annual Report be received for information to ensure transparency between the owner and operating authority.

Sub-committee Discussion: The Manager of Environmental Services advised that the Water Pollution Control Plant is owned by the City but operated under contract by the Ontario Clean Water Agency (OCWA). As part of their environmental compliance approval, OCWA is required to submit this report to ensure they meet all expectations of the Ministry. A few key points from the report were noted, such as flow rates being 13% less than the year before due to less precipitation and snow melt and five overflow events in 2021.

It was noted that the Ministry of Environment inspected the plant in 2016 and the Ministry of Labour completed an inspection in 2018. It was questioned whether that length of time between inspections was standard. The Manager advised that he would need to check into inspection timelines but noted that wastewater may not have the same frequency of inspection as water.

Motion by Councillor Vassilakos

Sub-committee Recommendation: THAT the 2020 Stratford Water Pollution Control Plant Annual Report be received for information to ensure transparency between the owner and operating authority.

Carried

7. Capital Project Update

Sub-committee Discussion: The Director of Infrastructure and Development Services advised that most capital construction projects completed in 2020 have started final restoration work such as soil repairs and minor construction repairs.

The Queen Street storm trunk sewer open house will be available online for area residents to review and provide comments. It was noted that the electronic open houses have been received well.

Staff are working with Canada Post to adjust mailbox locations on O'Loane Avenue.

The asphalt resurfacing open house will be online soon, with tendering in spring and construction in the summer. This includes portions of Romeo Street North and South.

The main sidewalk projects for the year are on West Gore from St. Vincent to John and Mornington from McCarthy to Graff. Design is ongoing, tenders will go out in a month.

T.J. Dolan Multi-use trail tenders are in and staff are reviewing and waiting on funding announcements.

Planning is dealing with over 20 formal consultations at this time.

Staff are proceeding with a pilot project to use a small robot for sidewalk inspections.

Hydrant flushing is ongoing and Public Works is almost complete with the first round of street sweeping and sod damage repairs.

In response to a question regarding the John Street dam, the Manager replied that there was quite a bit of debris where the overflow meets the dam. UTRCA staff cleaned most of it out and City staff removed larger items.

A concern from a resident experiencing discoloured water for multiple days was noted. The Manager stated that the spring flush is worse than the fall flush as there is a longer period between flushes and condition of the water mains and high iron content of the water continues to be a problem. A uni-directional flushing program will be piloted in fall of 2021 which will hopefully mitigate some of the discolouration issues.

The remainder of the status update will be listed on the May 10, 2021 Infrastructure, Transportation and Safety Committee agenda.

8. New Business

8.1 Lakeside Drive

Sub-committee Discussion: The Vice-Chair advised resident concerns had been received regarding speeding on Lakeside Drive, safety of swans and unsafe operation of motorbikes. She inquired as to the status of an outstanding report on some of these issues. She also inquired about making Lakeside Drive a one-way street with the other lane to be used as a multi-use trail.

Mr. Dujlovic responded that the report is on the list, however, staff shortages have put them a bit behind. He also advised that speeding or other traffic complaints should be reported to the police, who recently advised they would increase enforcement in the area. The difficulty of modifying people's behavior and the need to consult with the Festival if temporary road closures in the area will be considered again this summer were discussed.

Motion by Councillor Vassilakos

Sub-committee Decision: THAT staff report back at the May Infrastructure, Transportation and Safety Sub-committee meeting on how temporary road closures on Lakeside Drive went in 2020, consult with the Festival and provide potential options for summer of 2021.

Carried

8.2 Garbage and Recycling on Forman Avenue

The Chair inquired on the status of adding more garbage and recycling bins along Forman Avenue. Mr. Dujlovic advised that the school was having students pick up garbage and it seemed to be improving.

He suggested that the Director follow up with the Supervisor of Public Works to review and locate some garbage and/or recycling receptacles.

It was suggested that the church would be a good place to locate bins.

9. Advisory Committee/Outside Board Minutes

The following Advisory Committee/Outside Board minutes were provided for the information of Sub-committee:

- Accessibility Advisory Committee minutes of March 2, 2021
- Active Transportation Advisory Committee (ATAC) minutes of February 24, 2021
- Energy and Environment Committee minutes of March 4, 2021

10. Next Sub-committee Meeting

The next Infrastructure, Transportation and Safety Sub-committee meeting is May 26, 2021 at 3:30 p.m.

11. Adjournment

Motion by Councillor Ingram

Sub-committee Decision: THAT the Infrastructure, Transportation and Safety Sub-committee meeting adjourn.

Carried

Meeting Start Time: 3:30 P.M.

Meeting End Time: 4:15 P.M.



MANAGEMENT REPORT

Date: May 10, 2021
To: Infrastructure, Transportation and Safety Committee
From: Ed Dujlovic
Report#: ITS21-014
Attachments: Public Meeting Minutes: March 15 2021; Aerial photo of T. J. Dolan Drive between Centre Street and St. David Street; Map of T. J. Dolan Drive between Centre Street and St. David Street

Title: Proposed Closure of T. J. Dolan Drive from Centre Street to St. David Street

Objective: To obtain Council direction on the proposal to permanently close the portion of the paved road known as T. J. Dolan Drive between Centre Street and St. David Street.

Background: In February of 2021 Council approved the following recommendations:

THAT Council approve the permanent closure of T.J. Dolan Drive from St. Vincent Street South to St. David Street;

AND THAT Staff prepare a road closure by-law for T.J. Dolan Drive from St. Vincent Street South to St. David Street to be presented at a future Council meeting.

AND THAT Staff proceed to give public notice that Council is to consider a by-law to permanently close T.J. Dolan Drive from St. David Street to Centre Street for conversion to a multi use trail.

On March 15, 2021, a public meeting was held to receive input from the public on the proposed closure and conversion to a multi-use trail. Concerns and comments that were raised at public meeting and through submissions made were as follows:

- Loss of parking along T.J. Dolan Drive,
- Increased parking pressure on the John Street parking lot,
- Access to the river by car,
- Vehicles being able to drive up the hill on St. David Street in the winter,

- Increased parking of vehicles on St. David Street and Centre Street,
- Access to backyards,
- Increase in property values and the impact on property taxes,
- Concerns regarding grass cutting,
- Generation of garbage,
- In support of the road closure to convert to a multi-use trail.

Emergency services were contacted to determine what concerns they would have with the proposed closure. Police, fire, and paramedics services did not have any concerns. The City's Active Transportation Advisory Committee passed a motion in favour of the proposed closure and conversion to a multi-use trail. The City's Public Works department indicated a need for snow storage and a turn around at the closed end of St. David Street for maintenance vehicles. They did not have concerns with maintaining the St. David Street in the winter.

Analysis: T.J. Dolan Drive from St. David Street to Centre Street has a 5.5m to 6.6 m wide paved surface, no curbs or storm sewers, has a 3.0m granular shoulder on the river side from Centre Street to approximately 115.0m towards St. David Street, and has a posted speed limit of 30km/h.

The 2019 road assessment rates the condition of the road as good. This is a result of asphalt that was laid in 2017 by Public Works. The road base was in very poor condition. The road is already showing signs of failure in several locations since the work was done and the road would have to be rebuilt in the near future. The cost to reconstruct the road is estimated at \$200,000.

Currently there are no restrictions with respect to parking on Centre Street or St. David Street in the immediate area.

City staff reviewed three options as follows:

Option 1 – Two Way Traffic and 3.0m Paved Multi-use Trail

- The trail would be located on the north side.
- Would need to cut into the hill on the south side to shift the road, to make room for the trail.
- Construction of barrier curb between road and trail.
- Relocation of 2 existing streetlights.
- Loss of 3 trees.
- Construction of a retaining wall for 100.0m.
- Loss of all existing parking on T.J. Dolan Drive
- Can use on street parking on St. David Street and Centre Street

Option 2 – One Way from St. David Street to Centre Street and 3.0m Paved Multi-use Trail

- The trail would be located on the north side.
- From St. David Street approximately 64.0m slight shift of the road to the south required.
- Minimal impact on trees.
- Relocation of 2 existing streetlights.
- Construction of barrier curb between road and trail.
- Existing parking on T.J. Dolan Drive can be maintained.
- Can use on street parking on St. David Street and Centre Street

Option 3 – Road Closure for 3.0m Paved Multi-use Trail

- Construction of turn around needed on St. David Street
- Loss of all existing parking on T.J. Dolan Drive
- Parking can be constructed on Centre Street at T.J. Dolan Drive
- Can use on street parking on St. David Street and Centre Street
- No impact to trees or existing lighting on T.J. Dolan Drive
- Trail would be located along the centre line of the existing road.
- More green space.
- Trail can be aligned so that there is more green space between the trail and the river.

Option 1 is not recommended as there is no opportunity to construct new parking to compensate for the loss of parking on T.J. Dolan Drive and results in the loss of trees and green space.

Option 2 would have the least short-term cost as additional parking and turn around construction not required. It does not address the long-term road needs. Addresses the concerns of the two property owners that front St. David Street during the winter season and maintains existing parking.

Option 3 would require the construction of a turn around and additional parking to compensate for lost parking spaces. Provides for a trail without interaction with vehicles. Increases the green space. Public Works has advised that roads with hills are done on a second priority basis for winter maintenance. Future capital and maintenance cost would decrease with reduced hard surface to maintain. The City does have a policy in place that allows for application to temporarily access City lands to get to private property.

Financial Impact: Funding has been included in the 2021 Capital Budget to construct a new trail from St. Vincent Street South to St. David Street in the amount of \$100,000.

In late November of 2020, the City was advised that we would receive \$302,406.72 through the COVID stream under the Investing in Canada Infrastructure Program (ICIP) in Ontario. Under this program active transportation projects were eligible for funding. An application was made for the trail that included converting T.J. Dolan Drive to a trail all the way to Centre Street from St. Vincent Street South. The City has yet to be advised if the application has been approved.

If the application is approved there will be just over \$400,000 to complete the project.

Alignment with Strategic Priorities

Mobility, Accessibility and Design Excellence

Improving ways to get around, to and from Stratford by public transit, active transportation, and private vehicle.

Developing our Resources

Optimizing Stratford's physical assets and digital resources. Planning a sustainable future for Stratford's resources and environment.

Staff Recommendation: THAT T.J. Dolan Drive between St. David Street and Centre Street be closed and converted to a multi-use trail.



Ed Dujlovic, Acting Director of Infrastructure and Development Services



Joan Thomson, Chief Administrative Officer



Stratford Map



Legend

- Property Parcel
- Aerial 2015 20cm

1: 770



39.1 0 19.55 39.1 Meters

NAD_1983_UTM_Zone_17N

© City of Stratford

Map Printed: March 4, 2021

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

Proposed Closure of T.J. Dolan from St David St. to Centre St.



CITY OF STRATFORD PUBLIC MEETING MINUTES

A **PUBLIC MEETING** was held on Monday, March 15, 2021 at 6:05 p.m., via electronic participation to give the public and Council an opportunity to hear all interested persons with respect to the proposal to pass a by-law to permanently close T.J. Dolan Drive from St. David Street to Centre Street.

COUNCIL PRESENT: Mayor Mathieson – Chair-presiding, Councillors Brad Beatty, Graham Bunting, Jo-Dee Burbach, Tom Clifford, Dave Gaffney, Bonnie Henderson, Martin Ritsma, and Kathy Vassilakos.

STAFF PRESENT: Joan Thomson – CAO, Ed Dujlovic – Director of Infrastructure & Development Services, David St. Louis – Director of Community Services, Kim McElroy – Director of Social Services, Christopher Bantock – Deputy Clerk, Michael Mousley – Transit Manager, John Paradis – Fire Chief, Jodi Akins – Council Clerk Secretary and Nancy Bridges – Recording Secretary.

REGRETS: Councillors Danielle Ingram and Cody Sebben.

ALSO PRESENT: Dorothy Van Esbroeck, Kirk Riehl, Jane Marie Mitchell, Patrick O'Rourke and other members of the public.

Mayor Mathieson called the meeting to order and stated the purpose of the meeting is to give Council and the public an opportunity to hear all interested persons with respect to the proposal to pass a by-law to permanently close T.J. Dolan Drive from St. David Street to Centre Street for conversion to a multi-use trail.

Mayor Mathieson explained the order of procedure for the public meeting.

STAFF PRESENTATION

Ed Dujlovic, the Director of Infrastructure and Development Services, advised the City previously closed a section of TJ Dolan Drive from St. Vincent Street to St. David Street. The proposed multi-use trail would be a hard surface, approximately 3-4 metres wide, with benches and other amenities. To accommodate the multi-use trail, TJ Dolan Drive from St. David Street to Centre Street needs to be closed. St. David Street would become a cul-de-sac at the end where T.J Dolan would be closed if the proposal is approved. No detailed drawings are available at this time and staff will bring a report back to Council addressing comments and concerns from the public meeting.

QUESTIONS FROM COUNCIL

Councillor Burbach inquired if there would be winter maintenance of the multi-use trail. The Director noted it would be a four-season trail with winter maintenance.

Councillor Vassilakos asked staff if parking could be included in the design. The Director stated staff will look at all options and that there is the potential to include parking along St. David Street should that direction be provided.

Councillor Henderson suggested making St. David Street one-way and including trail space within the redesign. The Director noted staff is aware of public comments regarding making St. David Street one-way and information will be included in a future report to Council.

DELEGATIONS

Dorothy Van Esbroeck noted she is opposed to the closure and has concerns with the lack of notice of the public meeting. Ms. Van Esbroeck noted the public uses TJ Dolan Drive for parking when using the TJ Dolan trail. The parking lot for the trail is too small and on days of snowfall the parking is not always accessible or cleared. She was under the impression that the original closure of a portion of TJ Dolan Drive was temporary. She is in favour of repairing the road and including a multi-use trail beside the road. Ms. Van Esbroeck requested the City consider the following:

1. Be proactive and let the public know when there are changes proposed and meetings scheduled. She would like to see a sign located on TJ Dolan Drive informing the public of upcoming meetings.
2. Consider other options, such as only closing the road in the summer.
3. Be clear about the problems and why the closure is proposed.

Ms. Van Esbroeck stated that until more information is given to the public, she is opposed to permanently closing this portion of T.J. Dolan Drive.

Kirk Riehl noted he submitted a letter of opposition to staff. He likes the idea of a multi-use trail but stated concerns relating to the steep grade of St. David Street and the proposed change to a cul-de-sac.

Jane Marie Mitchell stated her disappointment with the lack of transparency from the City and lack of information regarding the background of the closure and future plans for the area. She noted she uses the road to park and walk around the river and there is already a lack of parking for the TJ Dolan trail. Ms. Mitchell stated that she has submitted a petition with signatures from others who are unhappy with the proposed closure. She noted the following:

- Closing the road will remove the ability to park right next to river for those with accessibility issues;
- There is currently a need for parking by the river for individuals who do not live nearby;
- Creating a one-way street with a low speed-limit would ease concerns and allow for a multi-use trail and vehicles to co-exist; and
- Placement of a washroom near the trail.

Patrick O'Rourke noted he sent an email of opposition to staff. He is an avid user of the area and sees no problem with the interaction between pedestrians and vehicles. The road is currently being used by all methods of transportation and therefore why fix a problem that does not exist. He noted concerns during the winter months with changing St. David Street into a cul-de-sac. Mr. O'Rourke stated redirecting the money from this project to other worthwhile causes in the City would be a better idea.

QUESTIONS FROM THE PUBLIC

Staff noted one comment in the Q&A from Ken Clarke regarding his concerns with eliminating the parking on TJ Dolan Drive and that it may force people to park in the TJ Dolan trail parking lot.

QUESTIONS FROM COUNCIL

Councillor Clifford inquired if it was members of the public asking for the closure. The Director stated the proposal is a result of the closure of the first section of TJ Dolan Drive and that the public did not make the request.

Councillor Vassilakos requested that staff include the following information in their staff report:

- Condition of the road
- Cost of road maintenance
- Is this section of TJ Dolan Drive affected by the ice and snow like the other section that was previously closed?

The Director stated that this information would be made available.

Staff noted one additional question in the Q&A from an anonymous member of the public. They inquired if the closure and multi-use trail are part of a larger plan. The Director noted there are no additional plans and that closure was suggested by staff due to the area of T.J. Dolan being a part of the parks system.

Mayor Mathieson noted the matter will be considered at a future Infrastructure, Transportation and Safety Committee meeting and that a video recording of the meeting would be posted to the City's website.

Mayor Mathieson adjourned the meeting at 6:31 p.m.

The following request to receive further information was received from the public meeting on March 15, 2021:

Kirk Riehl



Stratford Map



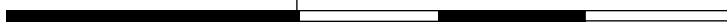
Legend

- Property Parcel
- Avon River/Lake Victoria
- Parks

1: 1,539



59.8 0 29.91 59.8 Meters



NAD_1983_UTM_Zone_17N

© City of Stratford

Map Printed: March 4, 2021

Disclaimer: This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

Proposed Closure of T.J. Dolan from St David St. to Centre St.

From: JamesColbeck <[REDACTED]>
Sent: Sunday, May 2, 2021 1:50 PM
To: Michelle Cronin [REDACTED]>
Subject: Proposed Closure of T. J. Dolan Drive from Centre Street to St. David Street - Upcoming Infrastructure, Transportation and Safety Committee

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

The Colbecks

[REDACTED] St. David Street, Stratford, Ontario [REDACTED]
[REDACTED]

Good afternoon, Ms. Cronin,
I was pleased to receive your notification (below) from a neighbour today and delighted to read the UITSC is proceeding with the T.J. Dolan Drive project analysis.

I have already sent my detailed considerations to Mr. Dujlovic and the Council a couple of months ago. I would request that these be brought forward as appropriate for the May 10th deliberations. Since that last meeting, I have had ample opportunity to reassess my submission - having taken many walks along that roadway as a resident of the neighbourhood - and still believe it is definitely worth serious consideration.

Thank you.

james

James Colbeck

From: JamesColbeck [REDACTED]
Sent: Wednesday, March 3, 2021 11:19 AM
To: Ed Dujlovic <[REDACTED]>
Cc: Dan Mathieson [REDACTED]; Brad Beatty [REDACTED]; Graham Bunting [REDACTED]; Jo-Dee Burbach [REDACTED]; Tom Clifford [REDACTED]; Dave Gaffney <[REDACTED]>; Bonnie Henderson [REDACTED]; Danielle Ingram [REDACTED]; Martin Ritsma [REDACTED]; Cody Sebben [REDACTED]; Kathy Vassilakos [REDACTED]
Subject: The TJ DOLAN Walking/Cycling Trail Project

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

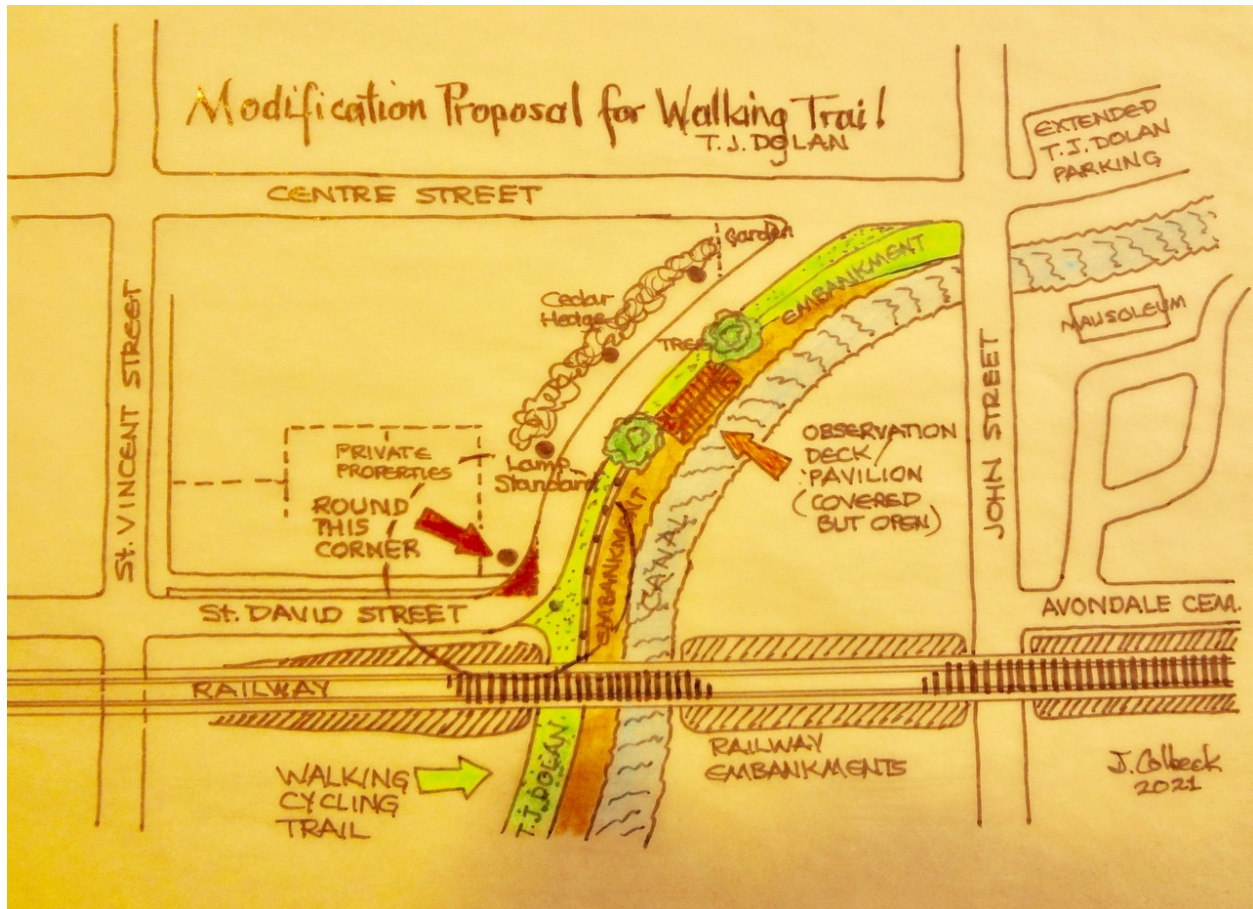
The Colbecks

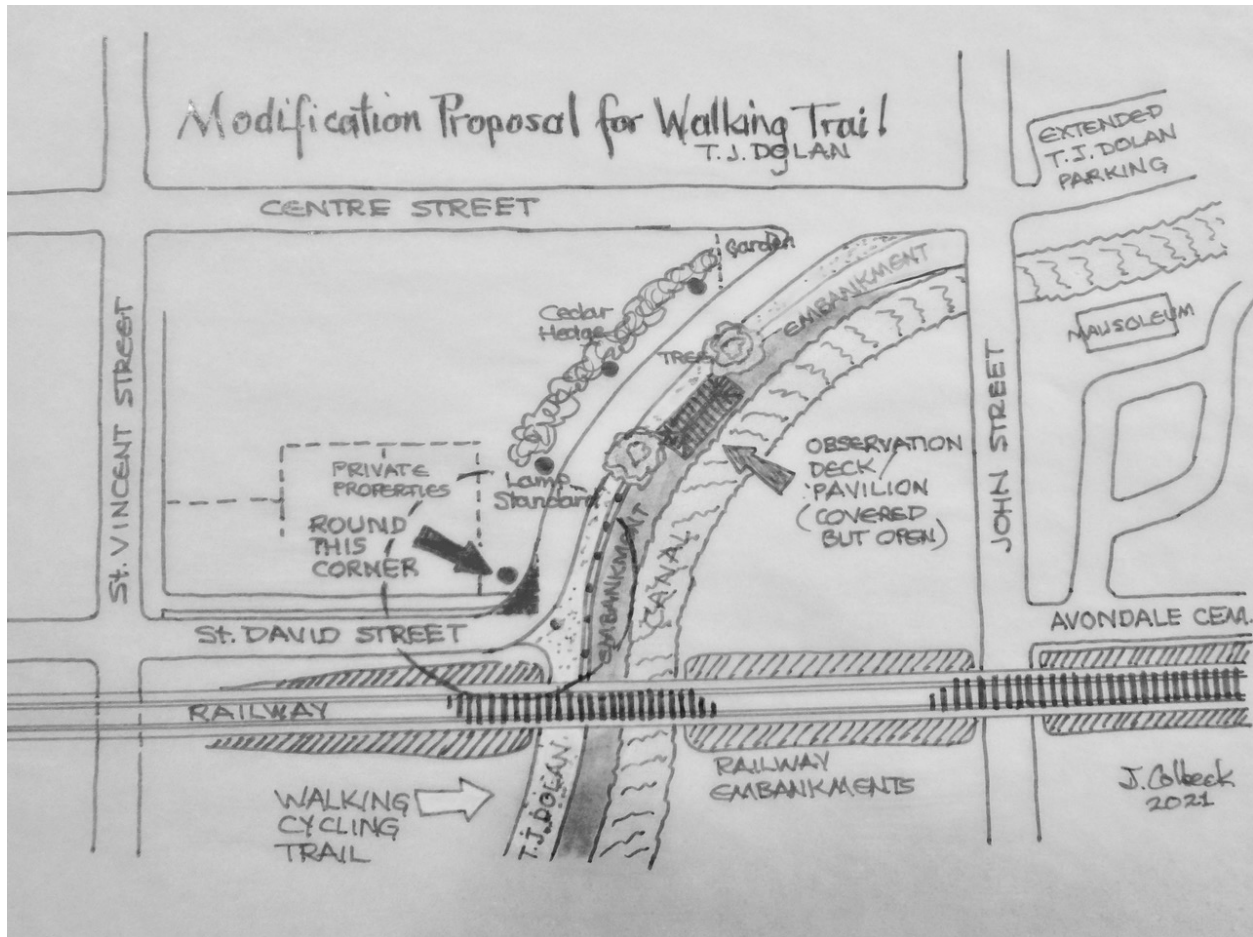
[REDACTED] St. David Street, Stratford, Ontario [REDACTED]
[REDACTED]

RE: The TJ DOLAN Walking/Cycling Trail Project (St. David Street to John Street)

Good morning, Mr. Dujlovic,
Hearing there is to be a virtual meeting on this theme and further to my submission of a few weeks ago, I wish to submit the following rough conceptualization in support of what I spelled out in text in that email. I do apologize for the quality of this submission (not to scale); TIME is not a friend at the moment.

There is one addition I have made here which is not spelled out in my earlier presentation: a covered Observation Deck/Pavilion located between the two dominant trees along the path... a spot where people might stop and rest, take time to paint a picture or take a photograph, read a book, visit, etc. Contrary to what some might think, there is a very restful view from there across the canal. By the same token, this structure would not intrude on space enjoyed by others wishing to fish further along the embankment towards Centre Street, as individuals/families do from time to time.





The word “**Extended**” penned in the TJ Dolan Parking Lot up right could/should read “**Expanded**”.

This sketch supports the concept of maintaining St. David Street-into-the-TJ Dolan as a two-way drive as opposed to closing the TJ Dolan off to traffic and installing a **cul-de-sac** at the bottom of the St. David Street hill.

Respectfully submitted with Best Wishes.

Sincerely,

james



MANAGEMENT REPORT

Date: April 28, 2021
To: Infrastructure, Transportation & Safety Sub-committee
From: Ed Dujlovic, Acting Director of Infrastructure & Development Services
Report#: ITS21-011
Attachments: Natural Resources Canada: Net Zero Energy and Net Zero Energy Ready Housing

Title: Passive House Standards and Net Zero Ready Homes

Objective: To provide information and seek direction on the City of Stratford implementing a policy requiring all development proposals for residential dwelling units to meet Passive House Standards, be Net Zero ready, and provide a subsidy for such developments.

Background: At the February 4, 2021 Energy & Environment Advisory Committee meeting, the following motion was passed:

THAT the Energy & Environment Advisory Committee requests an investigation into adopting a policy that the City of Stratford will only accept development proposals for homes, apartments and other dwelling units that meet Passive House Standards (PHIUS), and that such developments be net zero ready, be referred to staff;

AND THAT the Energy & Environment Advisory Committee recommends that the City consider time-limited 10% reductions in development charges and property taxes for any such buildings in order to offset the potential additional cost of construction. Carried.

Analysis: Passive building comprises a set of design principles used to attain a quantifiable and rigorous level of energy efficiency within a specific quantifiable comfort level. "Optimize your gains and losses" based on climate summarizes the approach. To that end, a passive building is designed and built in accordance with these five building-science principles:

1. Employs continuous insulation throughout its entire envelope without any thermal bridging.
2. The building envelope is extremely airtight, preventing infiltration of outside air and loss of conditioned air.
3. Employs high-performance windows (double or triple-paned windows depending on climate and building type) and doors - solar gain is managed to exploit the sun's energy for heating purposes in the heating season and to minimize overheating during the cooling season.
4. Uses some form of balanced heat- and moisture-recovery ventilation.
5. Uses a minimal space conditioning system.

Passive design strategy carefully models and balances a comprehensive set of factors including heat emissions from appliances and occupants to keep the building at comfortable and consistent indoor temperatures throughout the heating and cooling seasons.

The PHIUS that is included in the motion refers to the Passive House Institute United States standards. There is a Canadian equivalent, Passive House Canada. Passive House Building Certification is the internationally recognized building certification system, providing third-party verification and a stamp of quality assurance that a building meets the high performance and comfort levels of the Passive House standard.

Net Zero Homes produce as much clean energy as they consume. They are up to 80% more energy efficient than typical new homes and use renewable energy systems to produce the remaining energy they need. A Net Zero ready home has a renewable energy system designed for it that will allow it to achieve Net Zero Home performance, but the renewable energy system is not yet installed.

The Canadian Home Builders Association operates a program to allow builders to become a Qualified Net Zero Builder. The builder must complete four Net Zero training courses and a Building Science course. Once the training is complete the builder then must become an EnerGuide builder by registering with Natural Resources Canada (NRCan). There are few builders in Ontario that have achieved this designation with the nearest in London and Kitchener/Waterloo.

In 2019 NRCan released a report entitled "Net Zero and Net Zero Ready Housing" on lessons learned from pilot projects. The report highlighted several benefits and challenges associated with building Net Zero and Net Zero ready housing. They are as follows:

- Thermal comfort and a quiet indoor environment for the occupants.
- Lower annual energy bills that protect the homeowners from future increases in energy prices.
- Cost of construction can be difficult to estimate.
- Upfront costs and benefits they offer may not be obvious to buyers.

- Resale value uncertainty.
- Training for the builder and sub-contractors.
- Quality control and longer build time.
- Training for Building Inspectors.

The average additional cost to make a home Net Zero Ready was estimated to be \$16 per sq. ft. with energy savings for a natural gas heated home of \$400 per year.

Energy efficiency standards for buildings in Ontario are governed by the Ontario Building Code (OBC). The City of Stratford cannot legally require buildings to exceed the minimum requirements contained in the OBC. Accordingly, the City could only promote/support the building of Net Zero Ready or Passive Homes. The City should hold discussions and consult with the Stratford Area Builders Association, if there is an intent to move forward with a program to promote Net Zero Ready or Passive Homes. There are potentially new changes coming with the OBC with regards to energy efficiency as well as within the National Building Code.

Municipalities have begun adopting plans or policies on green standards for development. These plans and policies often tie into their overall climate change plan. Some municipal examples of green standards include:

- The City of Toronto adopted a Green Standard in 2015 and a Zero Emissions Buildings Framework in 2017.
 - The Green Standard focusses on improving environmental, energy performance and resilience in new construction.
 - The purpose of the Zero Emissions Building Framework was to identify an effective means of updating the Toronto Green Standard greenhouse gas and energy efficiency measures that is both feasible for the construction industry and that addresses the city's climate, energy and resilience goals.
- The Town of Whitby adopted a voluntary Green Standard which is a set of performance measures developed for the purpose of evaluating the sustainability of new development.

The development of a green standard for the City of Stratford would take a significant amount of staff time, require meetings with community stakeholders and the financial impact to both the City and to the home buyer to implement the suggested measures would need to be determined. Assistance in developing the green standards may be required through the form of an outside consultant.

Financial Impact: With respect to the provision of a subsidy for such developments, any reduction in development charges for a Net Zero Ready or Passive Home would have to offset by a contribution from the tax base to make the development charge fund whole as legally required as per the Development Charges Act 1997, S.O. 1997,c.27. The development charge for a single detached dwelling for 2021 is \$14,678.

It is assumed that the reduction in the property taxes is only for one year. The average annual taxes paid for a new home that is currently being constructed in the City of Stratford is approximately \$5,400.

If the City were to implement a subsidy program, the most straight forward method is to provide a grant. Such a grant could be via a Community Improvement Program. The mechanism to implement the grant would need to be determined. Based on the 10% value as per the motion, the grant would be \$1,467 for the Development Charges and \$540 for the property taxes for a total of approximately \$2,000. The yearly total would be dependent on the number of Net Zero Ready or Passive Home that would be built. No funding was included in the 2021 budget to implement a subsidy program.

Alignment with Strategic Priorities

Developing our Resources

Optimizing Stratford's physical assets and digital resources. Planning a sustainable future for Stratford's resources and environment.

Staff Recommendation: THAT the development of a green standards policy, including the development of programs to offset associated costs such as a reduction in development charges or property tax relief, be referred to the 2022 budget.



Ed Dujlovic, Acting Director of Infrastructure & Development Services



Joan Thomson, Chief Administrative Officer



Net Zero Energy and Net Zero Energy Ready Housing

Lessons learned and key findings
from the ecoEII Net-Zero Demonstration
and the R-2000 Net-Zero Energy Pilot



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1. Introduction

In 2013, Natural Resources Canada (NRCan) launched two initiatives: the R-2000 Net-Zero Energy Pilot (R-2000 NZE) and the ecoEII Net-Zero Energy Housing Demonstration Project (ecoEII).

The **R-2000 NZE** was a pilot program to label Net-Zero Energy (NZE) houses. This initiative drew upon NRCan's "next generation" draft 2014 R-2000 Standard, the EnerGuide Rating System (ERS) and the HOT2000 modelling software, with new procedures that allowed builders to demonstrate that their houses would generate as much renewable energy as they would consume annually. NRCan issued a call for applications for the R-2000 NZE, whereby participating builders constructing high-performance houses received technical support for modelling the energy performance of their houses. Although fifteen builders applied to the R-2000 NZE initiative, only two went on to construct and label one NZE house each as part of the Pilot (Annex A). The remaining builders did not complete the NZE labelling initiative for a variety of reasons, including:

- They opted to withdraw from the Pilot rather than adapt their house designs to meet the Pilot requirements;
- They were unable to meet the final labelling deadline;
- They made use of ineligible technologies; or,
- They did not install the photovoltaic (PV) system required to achieve the NZE performance level.

NRCan's **ecoEII** was led by Owens Corning, with funding support from NRCan's ecoEnergy Innovation Initiative. Five production home builders (Annex A) from across Canada (Nova Scotia, Quebec, Ontario and Alberta) were selected to build net-zero energy market-ready houses. This project saw the builders construct 11 NZE single-family dwellings, one four-unit NZE row house, one NZE MURB (comprised of 6 units) and five NZER houses (this builder applied the initiative's design and modelling procedures but elected not to install the renewable energy systems required to achieve net-zero energy performance). The ecoEII builders, having constructed the NZE houses and MURB units using the same standards, methodologies and tools as those participating under the R-2000 NZE, were also included in the R-2000 NZE Labelling Pilot (outlined above).

Between the two initiatives, a total of 13 NZE single-family dwellings, one four-unit NZE row-house, one six-unit NZE multi-family building and five NZER houses were constructed. For the purposes of this paper, the term 'Pilot' shall refer to all the participating builders of net-zero energy housing, as outlined above; otherwise, each initiative will be referred to separately.

To demonstrate that their houses achieved NZE or NZER performance, Pilot builders had to comply with specific eligibility, modelling, testing and certification/labelling requirements.

The Pilot houses are among the most advanced houses ever constructed in Canada in terms of energy performance. They draw upon 40 years of research and innovation in energy-efficient housing (see Table 1) and benefit from the contributions of Canadian home builders, manufacturers, universities, federal and provincial governments, and the homeowners and early adopters that invested in those houses.

The Pilot houses represent an important step towards the broad adoption of net-zero and low-carbon home design and construction. They incorporate technologies, practices and learnings from the Canada Mortgage and Housing Corporation's EQUilibrium Sustainable Housing Demonstration Initiative (EQUilibrium), Canada's first effort to work with leading builders to plan, design, build, demonstrate and monitor net-zero houses, which were adapted for application in production homebuilding. As such, the Pilot marks a key milestone in moving towards some of the goals of the Pan-Canadian Framework on Clean Growth and Climate Change (e.g. Net-Zero Energy Ready building codes by 2030).

Table 1: Chronology of Canadian Advanced Housing Programs and Initiatives

Year/Time Frame	Initiative/Program
1977	Saskatchewan Conservation House
1980	Super Energy Efficient Homes (SEEH) Program
1982 – Present	R-2000 Program
1991 – 1993	Advanced Housing
1998 – Present	Canadian Centre for Housing Technologies (CCHT)
2005 – 2009	EQUilibrium Sustainable Housing Demonstration Initiative
2007	Factor 9 House
2013 – 2016	R-2000 Net-Zero Energy Pilot
2013 – 2016	ecoEII Net-Zero Energy Demonstration Project
2017	CHBA Net-Zero Home Labelling Program (v1)

This document summarizes key findings related to the design and construction of the Pilot houses, including the experiences of the builders participating in the program, and highlights how the Pilot programs built upon the knowledge gained under EQUilibrium.

2. Definition of a Net-Zero Energy House

For the purposes of this paper, Net-Zero Energy and Net-Zero Energy Ready are defined below:

A **Net-Zero Energy (NZE)** house is a house that produces as much energy from on-site renewable energy sources as it consumes each year. NZE houses are designed, modelled and constructed in accordance with NRCan's R-2000 Net-Zero Energy Pilot technical requirements.

A **Net-Zero Energy Ready (NZER)** house is a variant of the NZE house in which the builders have not installed the renewable energy generation system. NZER homes are also designed, modelled and constructed in compliance with NRCan's R-2000 Net-Zero Energy Pilot technical requirements, but instead of installing the renewable generation systems, builders provide home buyers with a design of a suitable system that would enable the home to reach net zero, and provisions within the home for installing such a system in the future.

The Pilot houses contain a range of proven and commercially available technologies and building practices designed to reduce the amount of energy a house requires to keep occupants comfortable. These houses share three common characteristics:

- **Building envelope measures:** NZE and NZER houses incorporate levels of insulation that generally well exceed current building and energy code requirements, achieve exceptional levels of airtightness and have fewer thermal bridges than code-built houses. With improved windows

and insulation and fewer air leakage pathways, these houses reduce the amount of heat lost in the winter and heat gained in the summer, making them much more energy efficient while also keeping occupants more comfortable. The houses are also quieter since outside noise penetration is significantly reduced by the improved envelope.

- **High-efficiency equipment:** NZE and NZER houses use very efficient technologies for space conditioning (heating and cooling), water heating, equipment control systems, ventilation equipment, lighting and appliances (such as ENERGY STAR®), thereby reducing the house's energy needs even further and helping to improve occupant comfort. NZE and NZER houses also incorporate energy or heat recovery ventilators (E/HRVs) to ensure a healthy environment by exhausting contaminants and providing occupants with fresh air to improve the indoor air quality while minimizing energy use.
- **Load reduction measures:** NZE and NZER homes use highly efficient lighting to reduce electricity use and low-flow fixtures to reduce water consumption. Some builders may opt to include high-efficiency appliances as well.

To offset their annual energy consumption demands, NZE houses also incorporate on-site renewable energy technologies such as solar photovoltaics. NZER houses, on the other hand, include provisions to allow homeowners to more easily install renewable energy systems at a later date should they decide to do so.

3. Improvements/Progress/Changes from Prior NZE Initiatives

From a modelling and certification perspective, the lessons and experiences from EQuilibrium led NRCan to introduce two significant changes in the development of the Pilot's requirements:

1. **Equipment performance ratings:** While prior NZE and low-energy demonstrations placed few limits on the technologies that could be used, NRCan introduced a new requirement that all mechanical and renewable systems be modelled in HOT2000, using data from an accepted performance test standard. This requirement meant that an emerging technology that had not been previously tested for use in Canada would be ineligible in the Pilot. The purpose of this requirement was to demonstrate that builders across Canada could utilize readily available technology to build NZE/NZER homes.
2. **Appliance and lighting baseloads:** Previous NZE and low-energy housing demonstration initiatives allowed participating builders to claim significant appliance and lighting load reductions and provided no guidance on how those reductions should be estimated. Post-construction monitoring from the EQuilibrium homes indicated that these homes consistently used more electricity for appliances and lighting than assumed during the design stage. To increase the probability that Pilot homes achieve NZE performance, NRCan provided a prescriptive procedure for estimating appliance and lighting loads. This procedure reduced the eligible load reduction that Pilot builders could claim.

4. Pilot Builder Experiences

Following the completion of the Pilot, NRCan interviewed the participating builders to solicit their observations and feedback on a variety of issues, including costs and affordability, construction practices, regulatory approval and homeowner awareness of NZE/NZER technologies. The following reflects the builders' perspective and experiences while participating in the Pilot initiatives:

Benefits of NZE/NZER housing

The builders participating in the Pilot cited several benefits of building a NZE house, including thermal comfort and a quiet indoor environment for the occupants, and lower annual energy bills that protect the homeowners from future increases in energy prices.

Costs and affordability

Pilot builders offered the following observations about construction costs and pricing of NZE houses:

- **Costs are hard to estimate:** Builders found that construction costs are difficult to determine especially during design, in part because problems and delays arising from the use of advanced technologies and construction methods cannot easily be priced out. One builder noted that the biggest costing challenge they incurred was related to the country of origin of mechanical and solar renewable systems. For example, contractors/sub-trades could only lock pricing offered to the builder for a three-month period because the systems were tied to fluctuating currency exchange rates (between United States and Canadian dollars). Builders may have to charge higher premiums and carry larger contingency funds to manage this risk and some said that they have been able to rapidly refine costing over the first four or five houses.
- **Costs and benefits may not be obvious to buyers:** Builders noted that the higher upfront capital costs associated with NZE/NZER houses may deter potential buyers or steer them towards resale markets. Home buyers traditionally value other more tangible upgrades such as interior finishes and other amenities over energy efficiency. One builder noted that, given the cost of natural gas and electricity (in most markets), home buyers may not be prepared for a long-term return on investment.
- **Resale value uncertainty:** Home buyers, real estate agents and lending institutions are uncertain about the resale value of NZE houses, raising concerns that a NZE/NZER home will retain no more value than a conventional home in future years. The financial and real estate sectors, including house appraisers, realtors and lenders, must quantify and communicate the value proposition in these products to alleviate concerns and enable home buyers to make an informed decision to purchase NZE/NZER houses.

Construction practices

NZE and NZER houses can represent a significant departure from current practices and code requirements. Pilot builders noted that the challenges of moving quickly to NZE housing are particularly acute because builders must address many issues all at once. One builder suggested that a stepped approach towards Net-Zero Energy or Net-Zero Energy Ready might ease the transition.

Costs associated with additional design work, changing practices, obtaining approval and remedying mistakes can quickly erode profit margins. Pilot builders reported the following challenges:

- **Training:** NZE/NZER houses use building envelope systems whose components and assembly steps differ from typical practice. Even though most Pilot builders used off-the-shelf components from a major insulation supplier, builders reported that trades training remained a challenge. Subcontractor training on the installation/construction details of building high-performance houses can represent a significant investment for builders. Participants are also concerned about retaining trades—builders may have to provide continuous training as subcontractors move from job to job. If NZE/NZER houses are to become widespread, builders need skilled labourers trained in building high-performance envelopes correctly and at fair prices. Despite these challenges, one ecoEII builder reported that trades and training costs dropped between each of the net-zero homes they built. After five net-zero homes had been built, they found that building a net-zero home required no more construction time than their standard product.
- **Quality control:** Quality control is critical in achieving high-performance and NZE/NZER housing. For example, poor attention to detail can create air-leakage pathways, which can make it difficult or impossible to achieve airtightness targets and increase the future risks of condensation in wall assemblies. Mistakes can be difficult and expensive to remedy. Pilot participants spoke about the importance of trained site supervisors with experience in the construction of low-energy and NZE/NZER housing. In particular, supervisors require skills in integrating the various NZE/NZER technologies and assemblies (e.g. house as a system), and scheduling and coordinating the various trades to avoid unintended consequences.
- **Scheduling:** Aside from the obvious increase in construction timeframes due to the installation of additional insulation levels throughout the building enclosure and achieving quality control measures such as airtightness testing, NZE/NZER construction introduces new scheduling challenges that builders must accommodate. For instance, trades that do not normally interact in conventional construction practices may be on site at the same time and may be unsure about how to complete interdependent tasks. If not coordinated in a timely manner, additional inspection of the PV system installation and grid connection by the Electrical Safety Authority (ESA) could impact and delay the scheduling of downstream activities, including inspections by municipal code authorities and blower door testing.

Code authority and Local Electrical Distribution Company (LDC) approvals

Building inspector education: NZE and NZER technologies differ from standard practices. Code authorities and building inspectors may be unfamiliar with NZE approaches and require additional building science training to understand and mitigate unintended consequences. For instance, Pilot builders reported that municipal inspectors expected to see polyethylene vapour retarders in place during framing inspections, even though those details are not recommended for advanced wall assemblies with low and impermeable external sheathing and integrated air barriers.

In addition to these challenges, some municipal architectural planning committees and bylaws prescribe limits on how and where photovoltaics (PV) can be installed. For example, municipal code authorities instructed one Pilot builder not to install PV on facades facing the street. This could be a major impediment to NZE if, for instance, the street side is the optimal orientation for PVs.

A NZE home's most visible characteristic—photovoltaics—also poses particular approval challenges:

- According to some builders, the Local Distribution Companies (LDCs), that is, companies responsible for distributing power from transmission lines to people's homes, were slow to approve grid-connected PV installations; some builders reported waiting months for permits to arrive.
- Builders observed that some LDCs may be unfamiliar with the bi-directional, net-metres used in NZE houses even though these metres may have been mandated in provincial legislation for their province.
- Electrical trades may be unfamiliar with ESA inspection procedures and timelines for grid connections.
- In some service areas, LDCs may be unable to connect photovoltaics to their current grid infrastructure. One Pilot participant reported that the LDC was unable to accommodate grid-connected PV, preventing the builder from meeting the Pilot requirements.

Homeowner awareness of NZE technologies and their benefits

Pilot builders generally agreed that homeowner awareness of NZE technologies, practices and benefits has not kept pace with industry. Home buyers generally have not equated the benefits of NZE/NZER houses, such as improved long-term thermal and occupant comfort, improved air quality and significantly reduced operating costs, with the higher initial capital investment costs. Based on their home buyer preference survey, one builder noted that home buyers expressed concerns around equipment maintenance requirements, lifespans (especially for solar panels) and replacement costs, and whether the home needed to be operated differently from conventional houses. In addition, the rules and regulations surrounding net-metering and grid connection are not clear to homeowners. This is an important issue for home buyers who want to understand their utility bills before they buy a new home.

House design – Improvements through iteration

One of the ecoEII builders, together with their energy consultant, continued to streamline and evolve the design of each successive house in the initiative, thereby driving down construction costs and cycle time. For example:

- By reducing XPS exterior wall insulation from three inches (75 mm) to two inches (50 mm), a builder was able to greatly simplify their wall design. The thinner wall profile enabled the builder to use standard fasteners, brick anchors and foundation ties instead of more expensive speciality hardware. The foundation could also be constructed one inch (25 mm) thinner while still supporting the brick veneer. Savings on hardware, labour and concrete amounted to a \$3,000 to \$5,000 cost reduction.
- The mechanical system was optimized by switching the all-electric premium heat pump (in the initial house design), which can operate at temperatures below -20°C, to subsequent house designs that incorporate a small-capacity hybrid gas furnace with an integrated electric heat pump, providing cost savings of up to \$6,000. In this hybrid system, the heat pump delivers heat efficiently at milder temperatures (above -15°C), and switches to the gas furnace in colder weather.

- Targeting the house airtightness levels to between 1.0 and 1.5 air changes per hour (at 50 Pa) resulted in a time and labour reduction of approximately 40 hours of work and a cost savings of approximately \$2,000.
- The original HWHP, which was very costly to install and operate, was replaced with a natural gas condensing unit with a 60% DWHR, saving approximately \$2,000.

The final two (out of five) NZE homes reached their “sweet” spot, balancing between the insulation levels, airtightness and amount of PV in order to significantly reduce costs from the first house built and maintain relatively equivalent modelled performance. NRCan’s R-2000 NZE technical protocols prevented the trade-off of building envelope performance for renewable energy systems (such as PV) and ensured that the envelope performance alone provided at least a 33% improvement in the home’s energy efficiency compared with the building code.

Having embarked on building NZER houses in nearly all of their new developments, the builder recommended incorporating dual-fuel (electricity and natural gas) heating systems in NZER houses as the cost to operate the electric air-source heat pumps can be prohibitive.

5. Observations from the Pilot

Based on examination of the Pilot home designs and feedback from builders, several observations about the current state of NZE home design are highlighted below.

Principles of NZE/NZER house design

The Pilot builders used the same design principles as other NZE and low-energy housing demonstration projects:

1. Design and construct a well-insulated and well-air-sealed envelope.
2. Use highly efficient equipment and appliances such as LED lighting and ENERGY STAR equipment, and conservation measures such as low-flow fixtures and smart thermostats to reduce the consumption of energy within the home.
3. Ensure the correct sizing of heating, hot water and ventilation equipment for a very efficient home (i.e. small loads).
4. Install on-site renewable energy (for NZE houses) or prepare the house for future renewable installation (NZER).

A key achievement in the Pilot was to demonstrate that these principles are relevant to the design of production-oriented housing and that they provide a pathway to cost-effective NZE performance using off-the-shelf technologies.

Attributes of the Pilot houses

Table 2, below, highlights some of the key building envelope and mechanical system attributes common to the Pilot houses and provides a range of performance levels that the various Pilot builders adopted in attaining their respective net-zero energy design. The minimum requirements (where applicable), as outlined in the 2015 National Building Code of Canada, are provided for reference purposes only. The design characteristics and specifications incorporated into a sampling of the Pilot houses are provided in Annex B.

In most instances, the minimum performance levels in the NZE houses exceeded the minimum National Building Code (NBC) requirements. All of the attributes of the NZE houses, taking into consideration their respective climate zones, significantly exceeded those outlined in the NBC.

Table 2: Range in Performance Levels for Various Attributes in NZE Pilot Houses

Attributes	NZE Pilot Ranges	2015 National Building Code ¹
Airtightness (ACH @ 50 Pa) – 1.5 ACH ₅₀ maximum prescribed	0.43 – 1.5	2.5 ACH ₅₀ ²
Roof/Attic RSI (R-value)	9.3 – 15.12 (R-53 – R-86)	6.9 – 10.43 ³ (R-39 – R-59)
Main exterior wall ⁴ RSI (R-value)	4.57 – 7.47 (R-26 – R-42)	2.78 – 3.08 ³ (R-16 – R-17)
Foundation walls RSI (R-value)	4.32 – 6.37 (R-25 – R-36)	1.99 – 2.98 ³ (R-11 – R-17)
Underslab – Above frost line RSI (R-value)	2.64 (R-15)	Unheated floors ³ 1.96 (R-11)
Underslab – Below frost line RSI (R-value)	1.76 – 3.52 (R-10 – R-20)	Unheated floors ³ Uninsulated
Window U-value (W/m ² K)	1.15 – 0.94	1.8 – 1.4
Window ER	25.92 – 44.16	21 – 29
Space heating (air source heat pump)	HSPF 7.83 – 9.74	HSPF ≥ 7.0
Water heating (heat pump water heaters) ⁵	EF 2.73 – 3.27	Heat pump ¹ EF ≥ 2.0
Heat recovery ventilator (HRV) efficiency (@ 0°C/@ -25°C)	67%/60% to 84%/72%	60% @ 0°C 55% @ -25°C
Drain water heat recovery (DWHR) efficiency	42.0% – 58.9%	NA
Solar PV capacity – NZE houses only (kW)	6.2 – 11.2	NA

¹ Values based on climate Zone 4 to Zone 8, respectively, and for houses with heat pumps for space heating.

² Air leakage rate assumed in NBC 9.36 performance path; not a mandatory requirement.

³ Effective thermal resistance values; houses with a heat recovery ventilator (HRV).

⁴ All five builders (see Annex A) in the ecoEII initiative exclusively used an exterior insulation system with an integrated air barrier in the building envelope design, a system supplied, manufactured and distributed by Owens Corning, the lead partner in the ecoEII Demonstration. The two builders under the R-2000 NZE Pilot used an insulated double-stud exterior wall assembly and exterior insulated wall assembly, respectively.

⁵ One of the builders incorporated a natural gas tankless water heater (having an EF of 0.98) in the design of their NZE house.

How the Pilot houses built differ from previous NZE designs

NRCan examined the home designs submitted under the Pilot and compared them to houses constructed in previous low-energy and NZE demonstration programs in Canada, including the 11 net-zero houses constructed under EQUilibrium. Although the Pilot program dictated some specific requirements, the following comparisons provide insight into how the Pilot builders incorporated technologies and approaches.

- **Simpler mechanical systems:** Analysis of the NZE Pilot designs shows that participating builders relied on using simpler approaches based on commercially available and proven technologies. Whereas prior NZE houses made extensive use of custom and experimental solar thermal systems for space heating and hot water, Pilot builders relied exclusively on readily available technology (e.g. cold-climate air-source heat pumps) and all but one used heat pump water heaters.
- **Cost-effective envelope design:** All of the NZE houses constructed in the Pilot significantly exceed insulation levels required by current building codes and demonstrate enhanced air tightness levels compared with conventional construction. However, the amount of insulation used in walls, attics and below grade was lower than previous NZE housing initiatives. This is likely because a higher efficiency air-source heat pump allowed the thermal properties of the building envelope to be offset while still achieving overall net-zero energy modelling performance. Because the lead partner in the ecoEII project was the project sponsor and insulation supplier, all of the ecoEII builders used the same exterior insulated sheathing and air barrier system.
- **Less reliance on passive solar:** Most of the NZE Pilot participants were production builders of houses in tract-built subdivisions. Limited lot orientations with appropriate south-facing exposures often restricted the ability to optimize passive solar design. Nevertheless, Pilot builders reported that the houses were designed to limit solar heat gains, reducing the risk of overheating and thereby decreasing the energy demand for the cooling of these highly insulated houses. Consequently, the Pilot houses featured smaller south-facing window areas than low-energy and NZE houses constructed in previous initiatives.
- **Greater use of solar PV:** Pilot builders made greater use of solar PV systems, which generate electricity from sunlight. Pilot builders included nearly twice as much PV in their house designs compared to previous demonstration initiatives (e.g. EQUilibrium) on a per square metre (m²) of floor area basis. One of the key drivers reported in influencing the greater use of PV is the reduction in PV prices; PV costs were more than 50% less during the Pilot than they were ten years before. Increased use of PV is also displacing other solar energy technology. For example, none of the Pilot builders installed solar thermal space heating or solar thermal water heating systems.

Finally, data from the Pilot builders suggest the costs to construct NZE houses are falling. While the costs vary from builder to builder, the median costs to upgrade a code-compliant home to NZE (including the renewable energy systems) under the Pilot were \$340/m² (\$31/ft²). If these houses had been constructed to NZER requirements, their estimated upgrade costs would have been approximately \$164/m² (\$16/ft²).

The observed NZE costs are lower than prior NZE cost benchmarks, including those reported in the EQuilibrium initiative. The biggest factor in this cost reduction is the falling price of PV. At the time of EQuilibrium, PV costs were approximately \$10/W installed, while Pilot builders reported average installed costs of \$3.50/W.

Analyses undertaken on the NZE Pilot project show that estimated utility bills in NZE and NZER houses are less than similar houses constructed to the 2015 National Building Code. Utility bill savings depend on local energy rates and what kind of house the NZE house is compared to.

- Savings in NZE and NZER are highest when compared to code-built houses with electric resistance heating. In Calgary, Ottawa and Toronto, median utility savings compared to these houses was approximately \$2,000/yr when constructed to NZER specifications, and approximately \$3,600/yr when constructed to NZE (including PV).
- Savings are lower when compared to gas-heated, code-built houses. Median NZER savings are estimated to be approximately \$400/yr, and NZE savings are estimated to be approximately \$2,000/yr.

While NZE/NZER houses do save energy and reduce utility bills, there are several reasons why NZE/NZER houses are unlikely to have a \$0 utility bill:

- Utility fuel consumption is driven by weather conditions and occupant behaviours and lifestyles that may be outside the envisaged design and modelling parameters.
- Make-up of provincial/territorial utility grids and their associated fuel costs.
- Availability of and rates for 'net-metering' and 'Feed-In Tariffs.'
- Unless the home is completely independent from the grid, homeowners are still obligated to pay fixed charges related to the utility's infrastructure and administration costs. In a NZE/NZER home, these charges will likely form the largest portion of the utility bill.

Replicability

In Section 4, the participating Pilot production builders identified some very real concerns (such as cost, affordability and construction practices) that appear to increase risks borne by the builder and may slow down the broader adoption of NZE/NZER housing by production builders. Despite the improvements in the Pilot program framework over previous initiatives, the scale of NZE (or NZER) house production is still very much at the "one-off" stage.

To date, the broad-scale adoption of NZE/NZER housing has been inhibited by a number of issues such as selection of appropriately sized heating, cooling and ventilation systems and equipment, a trained and qualified labour force, and an efficient approvals process by the authorities having jurisdiction. Furthermore, current production levels of NZE/NZER housing fall short of the production volumes necessary to benefit from "economies of scale."

There is a strong likelihood that some of the concerns and issues previously identified by the Pilot builders will be addressed only by stimulating and encouraging increased NZE/NZER house production levels and the continued development of cost-effective and reliable technologies and practices. Despite these concerns, Pilot builders continue to streamline their house designs and construction processes, and one builder has embarked on building nearly all of their new housing developments as NZER.

6. Future Work

While the Pilot demonstrated that NZE/NZER housing could be constructed affordably by production builders using off-the-shelf, commercially available products and technologies, some obstacles remain that hamper the broader adoption of NZE/NZER housing.

Monitoring of NZE and NZER houses

The biggest knowledge gap surrounding NZE/NZER houses is the lack of in-situ monitored performance data. While the EQUilibrium initiative included a year of comprehensive post-occupancy monitoring, the availability of independent, monitored data from the Pilot houses is sparser. While some Pilot participants installed monitoring equipment on specific components, the builders followed no consistent instrumentation strategy and data from these homes has not been compiled. The number of homes that approached or surpassed NZE performance is therefore unknown.

Despite the limited monitoring results, the Pilot houses are expected to use much less energy than conventional houses built to meet current energy efficiency requirements. Building envelope measures (including added insulation, upgraded windows, and improved air sealing techniques and procedures) provide consistent and predictable reductions in space heating demand.

There are many factors beyond the builders' control that affect energy use; however, two factors have a significant impact and effect on a houses' performance: weather and occupants (including the number of occupants and their behaviours and lifestyle). Both of these factors take on assumed values in the predictive energy modelling software, making it difficult to compare against actual performance. Nevertheless, previous monitoring studies confidently demonstrate that NZE houses use much less energy than a similar house built to code and the best knowledge suggests that the energy use should be close to net-zero energy on an average year.

Long-term envelope performance

NZE homes introduce new technologies that change the way the building envelope behaves—particularly the walls:

- Higher amounts of insulation reduce the amount of heat that flows through walls, affecting the temperatures inside the walls.
- Use of low-permeance insulation materials affects the way moisture moves into and out of wall systems.

In light of these new approaches, some observers in the construction industry have asked, “How will NZE wall systems perform over the life of the home?” Significant evidence suggests that these wall systems are sufficiently durable and resilient for use in Canadian housing:

- All of the envelope materials used in the Pilot are approved by the Canadian Construction Materials Centre (CCMC) and are accepted for use in Canadian construction under CCMC's guidance.
- Most of the Pilot homes used insulated sheathing wall systems; federal and university researchers have evaluated these systems over the last 20 years.

- Academic researchers and private consultants have used thermal and moisture simulation methods to examine the performance of these systems under a range of climate conditions.
- Variants of these systems have been used as part of low-energy demonstration and labelling programs over the last 30 years (refer to Table 1) and are increasingly used to comply with provincial building code requirements such as the Ontario Building Code, Supplemental Standard SB-12.
- Complementary work by third parties explores variants of these systems, with different combinations of air barrier, sheathing, framing, insulation, and vapour control systems. These systems and recommendations for their use are publically available.¹

All available evidence indicates that these wall systems are suitable for Canadian homes.

Nevertheless, follow-up on research is warranted. In prior energy efficiency demonstrations (including the R-2000 program), federal researchers have conducted long-term follow-ups on the constructed homes to ensure they continue to meet durability, comfort and performance expectations. Due diligence requires similar follow-up for homes built as part of the Pilot. In addition, emerging insulation materials may offer builders easier and more cost-effective ways to construct NZE homes; these materials and approaches will require monitoring and modelling to verify durability.

7. Concluding Remarks

In the R-2000 NZE Pilot and the ecoEII NZE Demonstration initiatives, a total of 13 single-family dwellings, one four-unit row house and one six-unit residential building were all constructed to NZE performance levels, in addition to five houses constructed to NZER. These houses are among the most energy-efficient houses constructed in Canada and they mark an important milestone towards the broader deployment of NZE and NZER houses.

The houses constructed under the Pilot generally used off-the-shelf technology compared with previous NZE and low-energy housing programs. They incorporate commercially available products in place of customized or experimental energy systems and, while constructing NZE/NZER houses still requires a cost premium above minimum code construction, this incremental cost was significantly lower in the Pilot than in previous low-energy demonstration programs and initiatives.

While Canada knows more about NZE/NZER houses than ever before, additional research is required to support their commercialization:

- The performance of the current generation of NZE/NZER houses has not been verified through monitoring or utility bill verification, leaving some uncertainty about their stated energy savings.
- Emerging materials and approaches that have not yet been tested in Canadian environments may impact envelope durability and should be investigated.
- Additional work is required to better understand and optimize the costs associated with building NZE/NZER housing and improving affordability of these advanced houses for Canadians.
- As these buildings age, researchers should conduct follow-ups to ensure that they continue to meet performance, comfort and durability expectations.

¹ See the Canadian Wood Council's Effective R Calculator (<http://cwc.ca/resources/effective-r/>)

These gaps can be addressed through ongoing follow-ups. Efforts to monitor energy use, wall moisture, indoor air quality, thermal comfort and occupant perceptions of the living environment, and to reconcile utility bills with the predictive models and tools, will build consumer and industry confidence in NZE/NZER design and technology.

Builders participating in the Pilot commented on the changes that NZE brings to production home building. Their feedback indicates that NZE construction may pose challenges not just to the builder, but also to the sub-trades, building inspectors, municipal code and utility approval departments, real-estate agents, and even home buyers. These groups are unfamiliar with the components within a NZE home, construction schedules and costs, and the benefits NZE housing has to offer. Builders suggested that improved training resources for sub-trades and building approval staff could help reduce costs and delays associated with NZE houses. Efforts to improve awareness among home buyers, the real estate industry and lending institutions would help ensure the market understands the value and benefits of these houses and is prepared to bear the initial upfront investment at this early adopter stage.

While improved awareness and training will provide a foundation for broader NZE/NZER deployment, industry capacity will grow as more builders incorporate NZE houses into their product lines. Increasing participation in voluntary programs and demonstration projects such as R-2000, the CHBA Net-Zero Labelling Program and Passive House will therefore be an essential strategy in meeting the objectives of the Pan-Canadian Framework (PCF). The PCF improves the energy efficiency of new constructions through the development and adoption of increasingly stringent model building codes, starting in 2020, with the goal that provinces and territories adopt a 'net-zero energy ready' building code by 2030.

ANNEX A:

PARTICIPATING BUILDERS IN THE R-2000 NET-ZERO ENERGY PILOT

Habitat Studio – Edmonton, Alberta



Sloot Construction Ltd. – Guelph, Ontario



PARTICIPATING BUILDERS IN THE ecoEII NET ZERO ENERGY DEMONSTRATION PROJECT

Reid's Heritage Houses – Guelph, Ontario



Minto Communities – Ottawa, Ontario
Detached House



Minto Communities— Ottawa, Ontario (four units, attached houses)



Construction Voyer – Laval, Quebec



Mattamy Houses – Calgary, Alberta



Note:

Provident Developments Inc. (from Halifax, Nova Scotia) was also a participating builder in the ecoEII project, building five Net-Zero Energy Ready (NZER) houses.

ANNEX B:

Design Characteristics Incorporated in Representative NZE Pilot Houses for Each Participating Builder

Builder	Habitat Studio (Edmonton, AB)	Mattamy (Calgary, AB)	Minto – Detached (Ottawa, ON)	Minto – Attached (Ottawa, ON)	Reid's Heritage Homes (Guelph, ON)	Sloot Construction (Guelph, ON)	Construction Voyer (Duvernay, QC)
Heating Degree Day (HDD)	5,120	5,000	4,500	4,500	3,890	3,890	4,200
Roof	R-80 blown/ R-40 flat	R-60 blown	R-60 blown	R-60 blown	R-60 blown	R-60 blown	R-52 to R-60 blown/ R-40 flat
Main walls	R-24 + R-17 (continuous insulation, double- stud)	R-24 + R-22.5 XPS (4.5")	R-24 + R-10 XPS (2")	R-24 + R-10 XPS (2")	R-22 batt + R-15 XPS (3")	R-24 + R-10 XPS (2")	R-24 + R-10 XPS (2")
Basement walls	2" Type 1 EPS	R-14 + R-20 XPS (4")	R-12 + R-15 XPS (3")	R-20 batt + R-15 XPS (3")	R-22 batt + R-10 XPS (2")	R-20 + R-5 XPS (1")	N/A
Underslab	R-15 XPS (3")	R-20 XPS (4")	R-10 XPS (2")	R-10 XPS (2")	R-10 XPS (2")	R-10 XPS (2")	R-15 XPS (3")
Windows	low-E triple-pane	low-E triple-pane	low-E triple-pane	low-E triple-pane	low-E triple-pane	low-E triple-pane	low-E triple-pane
HRV/ERV* 0 °C/-25 °C	84%/72%	84%/72%	75%/70%	75%/64%	67%/60%*	67%/60%	74%/64%
Space heating	ASHP 7.83 HSPF + Elec backup (in ductwork)	ASHP 9.57 HSPF + Elec furnace	ASHP 9.57 HSPF + Elec furnace	ASHP 8.26 – 8.43 HSPF + Elec furnace	ASHP 8.09 HSPF + Elec furnace	ASHP 8.7 HSPF + 97.5% AFUE NG furnace	ASHP 8.87 – 9.74 HSPF + Elec baseboard
Water heating	HPWH 3.27 EF	HPWH 2.78 EF	HPWH 2.78 EF	HPWH 2.78 EF	HPWH 2.78 EF	NG 0.98 EF tankless	HPWH 2.73 EF
DWHR	42%	43.5%	42.8%	46%	53.3%	58.9%	57.3%
Airtightness	0.43 ACH ₅₀	0.82 ACH ₅₀	1.24 ACH ₅₀	1.47 ACH ₅₀ average	1.13 ACH ₅₀	0.93 ACH ₅₀	0.75 ACH ₅₀
Solar PV	39 x 275 W	40 x 280 W	36 x 265 W	30-34 x 250 W per unit	33 x 265 W	41 x 235 W	150 x 255 W



MANAGEMENT REPORT

Date: April 28, 2021
To: Infrastructure, Transportation and Safety Sub-committee
From: Johnny Bowes, Manager of Environmental Services
Report#: ITS21-012
Attachments: Sewer Service Relining Agreement Template 2021,
 (Updated) S.1.8 – Sanitary Service Subsidy Program General
 Requirements,
 (Updated) S.1.10 – Upgrade of Sanitary Service Under the Subsidy
 Program

Title: Update of Sewer Policy S.1.8 and Sewer Policy S.1.10

Objective: To update the wording in Policy S.1.8 and Policy S.1.10 to provide residents with a clear understanding of the subject matter.

Background: The City of Stratford currently has policies in place that describe, in detail, our sanitary service subsidy program general requirements (S.1.8) and sanitary service upgrades under the subsidy program (S.1.10). These policies were adopted by Council on December 14th, 2020. Since then, there have been inquiries requesting clarification of 2 subsections within those policies. These subsections require updated wording to provide a clear understanding of the section information.

Analysis: Sewer Policy S.1.8. Sanitary Service Program General Requirements has subsection (S.1.8.4.) which describes a situation in which two properties share a sanitary service lateral. It currently reads:

S.1.8.4 When two properties share a **service lateral**, and there is no sanitary reconstruction project, the following shall apply:

- i. Cured in place liner is not an option
- ii. A **public drain connection** will be supplied to each property at city cost
- iii. **Private drain connections** will be at the sole expense of each homeowner

Subsection ii should be changed to read:

- ii. A **public drain connection** will be supplied to the property that does not have an existing service at city cost. The property that contains the existing shared sewer service lateral, will not be supplied a new **public drain connection**.

This should be changed so that there is a clear understanding that the common pipe of a shared service will not be replaced by the city since a functional public drain connection already exists on the property.

Policy S.1.10. Upgrade of Sanitary Service Under the Subsidy Program has a subsection (S.1.10.3) which describes what happens when an entire sanitary service is rehabilitated by means of a cured-in-place liner. It currently reads:

- S.1.10.3 When the **public and private drain connections** are both to be upgraded by **re-line**, the following applies:
- i. Re-lining will not be eligible where additional connections exist on the service.
 - ii. When the upgrade is completed with a cured-in-place liner for the entire service lateral, the City will be responsible for 50% of the total cost.

Subsection ii should be changed to read:

- ii. When the upgrade is completed with a cured-in-place liner for the entire service lateral, the City will be responsible for 50% of the lining portion of the work only. The City will not rebate any private plumbing required to install the liner, restoration, locates or warranties.

This section should be changed so that there is a clear understanding of the exact costs that are covered under the relining subsidy. There is also a Sewer Service Relining Agreement that is sent to the homeowner by the Engineering Department before the work commences which outlines these points in detail. This agreement has been attached to this management report for reference.

Financial Impact: Changing the wording of these two subsections will result in a cost savings in staff admin time as there are several parties involved in the subsidy program that spend time speaking with homeowners clarifying these points.

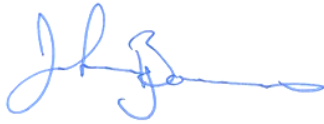
The subsidy program has historically not covered the cost of warranties, private plumbing work, locates and restoration when relining is completed. This update of the policies would eliminate any misinterpretation of the program and would allow it to continue as it has in the past without the City incurring any of these costs.

Alignment with Strategic Priorities:

Developing our Resources

Optimizing Stratford's physical assets and digital resources. Planning a sustainable future for Stratford's resources and environment.

Staff Recommendation: THAT Sewer Policies S.1.8 and S.1.10 are updated to reflect new wording outlined in Report (ITS21-012) that will help eliminate policy misinterpretation from the public.



Johnny Bowes, Manager of Environmental Services



Ed Dujlovic, Acting Director of Infrastructure and Development Services



Joan Thomson, Chief Administrative Officer

The Corporation of the City of Stratford	S.1	Sewers
Policy Manual	Dept:	Infrastructure and Development Services
	Committee:	Infrastructure, Transportation and Safety

S.1.8 Sanitary Service Subsidy Program General Requirements

Adopted: December 14, 2020

Amended:

Reaffirmed:

Related Documents:

☒ Council Policy ☐ Administrative Policy

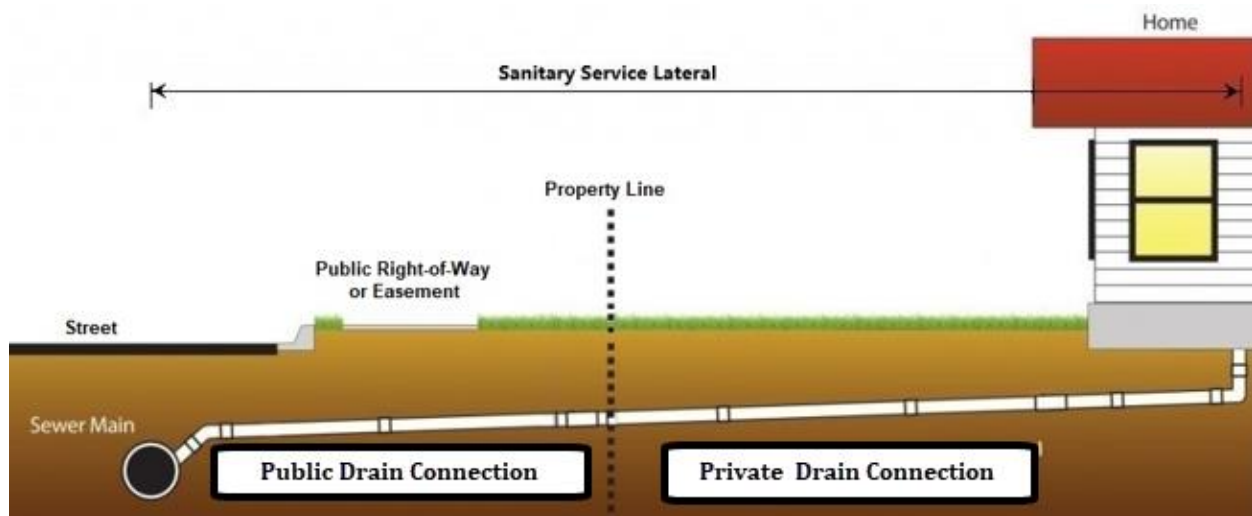
The following definitions apply:

The sanitary “**service lateral**” is composed of the public and private drain connections.

The “**public drain connection**” means the portion of the service lateral located within city property.

The “**private drain connection**” means the portion of the service lateral from the *property line into the building*.

Please refer to the image below for a visual description of the service lateral:



- S.1.8.1 Only residential properties are eligible for the subsidy program. Proof of residency may be required. Commercial, industrial, rental, and multi-use properties are not eligible. Residential properties that contain legal apartments (basement apartments for example) are not eligible for the subsidy program.
- S.1.8.2 A camera inspection will be performed by city forces, prior to decision making on upgrades, and all costs to be charged to the homeowner.
- S.1.8.3 When a homeowner wants to upgrade their sanitary **service lateral**, when there is not a reconstruction project, the City will have the authority to determine the most cost effective, efficient upgrade of the **public drain connection**. This may include full replacement, cured in place liner, or any other equivalent full upgrade.
- The homeowner will have the authority to determine the most cost effective, efficient upgrade of the **private drain connection**. This may include full replacement, cured in place liner, or any other equivalent full upgrade.
- S.1.8.4 When two properties share a **service lateral**, and there is no sanitary reconstruction project, the following shall apply:
- i. Cured in place liner is not an option
 - ii. A **public drain connection** will be supplied to the property that does not have an existing service at city cost. The property that contains the existing shared sewer service lateral, will not be supplied a new **public drain connection**.
 - iii. **Private drain connections** will be at the sole expense of each homeowner
- S.1.8.5 The City has the authority to deem projects ineligible for the subsidy program if:
- a) The failure or deficiency of the **service lateral** can be rectified by a spot repair.
 - i. If a spot repair is required on the **private drain connection**, the homeowner is responsible for the work. All spot repairs are 100% at the cost of the homeowner.
 - ii. If a spot repair is required on the **public drain connection**, the city is responsible for the work and will provide an estimate to the homeowner. A deposit for that amount must be paid in full prior to any repairs being initiated.
 - b) **Public drain connections** do not require an upgrade.
- S.1.8.6 For Sanitary Service Subsidy details, refer to:

Policy S.1.9 – Sanitary Service Subsidy Program during Reconstruction

For Sanitary Service Subsidy details during a reconstruction project, refer to:

Policy S.1.10 – Upgrade of Sanitary Service under the Subsidy Program

The Corporation of the City of Stratford	S.1	Sewers
Policy Manual	Dept:	Infrastructure and Development Services
	Committee:	Infrastructure, Transportation and Safety

S.1.10 Upgrade of Sanitary Service under the Subsidy Program

Adopted: December 14, 2020

Amended:

Reaffirmed:

Related Documents: Sewer Use By-law 65-70 as amended

☒ Council Policy ☐ Administrative Policy

S.1.10.1 That the following definitions apply:

The sanitary “**service lateral**” is composed of the private drain connection and the building sewer.

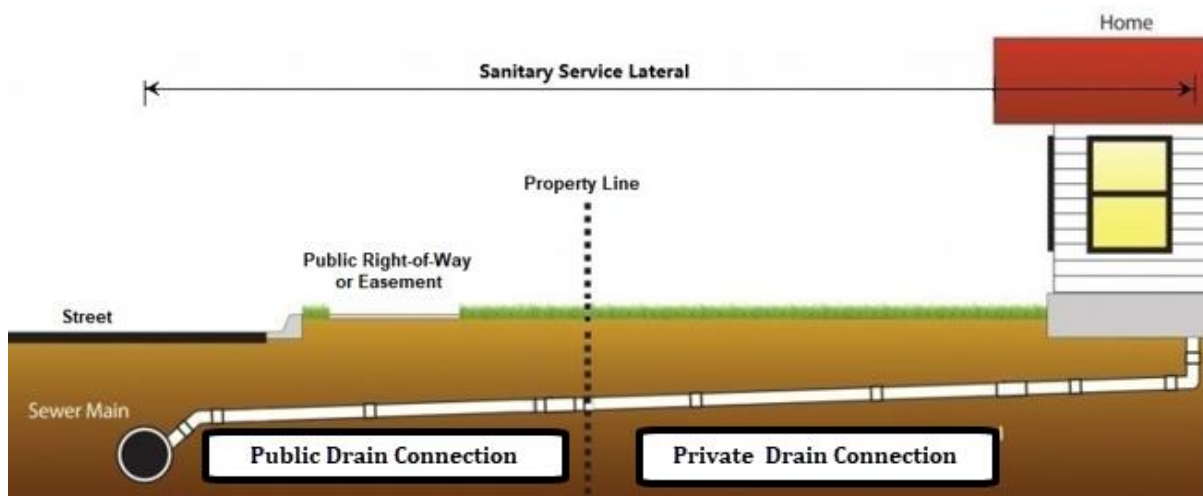
The “**public drain connection**” means the portion of the service lateral located within city property.

The “**private drain connection**” means the portion of the service lateral from the property line into the building.

Open-Cut refers to excavation exercises to complete the work.

Re-Line refers to non-invasive technology for rehabilitation purposes.

Please refer to the image below for a visual description of the service lateral:



- S.1.10.1 This policy applies to the upgrade of sanitary services where there is no sanitary reconstruction project taking place.

For sanitary service upgrades during a reconstruction project, refer to Policy S.1.9

- S.1.10.2 When the **public and private drain connections** are both to be upgraded by **open cut**, the following applies:

- i. When a homeowner wants to upgrade their sanitary **service lateral**, the homeowner pays \$4000 towards the costs for the **public drain connection**.
- ii. When a homeowner wants to upgrade their sanitary **service lateral**, the city will pay up to \$2000 towards the costs for the **private drain connection**.

- S.1.10.3 When the **public and private drain connections** are both to be upgraded by **re-line**, the following applies:

- i. Re-lining will not be eligible where additional connections exist on the service.
- ii. When the upgrade is completed with a cured-in-place liner for the entire service lateral, the City will be responsible for 50% of the lining portion of the work only. The City will not rebate any private plumbing required to install the liner, restoration, locates or warranties. These items must be listed separately on the invoice and are the responsibility of the homeowner.

- S.1.10.4 When the **public and private drain connections** are both to be upgraded by a combination of **open cut** and **re-line**, the following applies:

- i. When the upgrade is completed by re-line for the **public drain connection** only and open cut for the **private drain connection**, the City will be responsible for 50% of the total costs for the **public drain connection** and will contribute up to \$2000 once the **private drain connection** upgrades are completed. The percentage is based on Table A.
- ii. The **private drain connection** upgrades must be completed in conjunction with the **public drain connection** upgrades.
- iii. When the upgrade is completed by re-line for the **private drain connection** only and open cut for the **public drain connection**, the City will be responsible for 50% of the total costs for the **private drain connection** and the homeowner will contribute \$4000 of the total costs of the **public drain connection**.

Please refer to the following page for the subsidy cost breakdown chart.

Table A – Sanitary Subsidy Cost Breakdown

Method	Public Drain Connection	Private Drain Connection	Method
Reline	City pays 50% of cost	City pays 50% of cost	Reline
	Homeowner pays 50% of cost	Homeowner pays 50% of cost	
Open Cut	Homeowner pays \$4,000.00	City pays up to \$2,000.00	Open Cut
	City covers remaining cost	Homeowner covers remaining cost	
Open Cut	Homeowner pays \$4,000.00	City pays 50% of cost	Reline
	City covers remaining cost	Homeowner pays 50% of cost	
Reline	City pays 50% of cost	City pays up to \$2,000.00	Open Cut
	Homeowner pays 50% of cost	Homeowner covers remaining cost	



Infrastructure and Development Services Department
Engineering Division
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Stratford ON N5A 2M4

(519) 271-0250 Ext. 222
engpub@stratford.ca
www.stratford.ca

Re: Engineering Agreement for Relining of Sanitary Service – 123 John Street

The Infrastructure and Development Services department offers a 50% rebate for homeowners to reline the total length of their sanitary service from the private building to the mainline sanitary sewer under the Sanitary Service Subsidy Program.

To apply for this rebate, a qualified lining contractor, approved by the City, will need to perform the work. The City will require a submission of the invoice and paid receipt along with digital or physical copies of CCTV videos showing the post preparation video (V2) and the post lining video (V3) to prove that the full length of the service was relined.

The invoice must show separate line items for the work completed. Specifically, the individual cost of the liner installation (not including tax) per ft/m must be its own line item on the invoice. This is the portion of the invoice that is applicable for the sanitary liner rebate. Any additional work required to install the liner including but not limited to, internal and external plumbing or modifications required in order to install a liner, cleanout installation, locates, restoration, and/or warranties will not be covered under the subsidy program. These items must be listed separately on the invoice and are the responsibility of the homeowner.

This subsidy is only available to property owners who own and occupy the property as their primary residence.

After approval of the required submissions, a cheque for the subsidy will be made payable to the property owner.

I have read the above information and understand my obligation to be responsible for all requirements as stated above to receive the subsidy rebate.

Date: _____ Signature: _____

123 John Street
 Stratford, ON
 N5A 2S2
 John Smith
 519-271-0250

Please return or email a signed copy of this letter and payment for the Engineering Division to arrange for the work to be scheduled.



MANAGEMENT REPORT

Date: April 12, 2021
To: Infrastructure, Transportation and Safety Sub-committee
From: Johnny Bowes, Manager of Environmental Services
Report#: ITS21-013
Attachments: Stratford WPCP 2020 Annual Report - Final

Title: 2020 Stratford Water Pollution Control Plant Annual Report

Objective: To submit the 2020 Stratford Water Pollution Control Plant Annual Report to Sub-committee and Council for their information.

Background: The Stratford Water Pollution Control Plant (WPCP) is owned by the City of Stratford but operated under contract by the Ontario Clean Water Agency (OCWA). OCWA has prepared the 2020 Annual WPCP Report, which must be submitted annually to the Ministry of the Environment, Conservation and Parks (MECP), showing how the treatment plant performed throughout the year.

The report summarizes the operation for the WPCP and reports on all the activities that occurred at the treatment plant throughout the year. The report also indicates how the plant met all the Environmental Compliance Approval requirements for effluent discharge into the Avon River.

Analysis:

Total Flows - The treatment plant treated a total of 5,681,718 m³ of effluent for an average flow of 15,207 m³ per day. This is a significant decrease in flows from the last 3 years in which flows were between 7 and 7.5 million m³ per year. The design capacity of the treatment plant is 30,660 m³ per day and based on the flows received for 2020, operated at 51% of the design capacity. This percentage decreased from 64.56% in 2019.

Overflow Events - During the 2020 year, the treatment plant had 5 overflow events (2019 had 10 events) where there was discharge from the wet weather equalization tank and discharge into the Avon River. These events were all due to flows caused by heavy precipitation and/or snow melt and a total of 423,519 m³ (2019 – 364,173 m³) was discharged.

During a flow exceedance, the excess flow is diverted to an equalization tank and contact chamber where appropriate chlorination of the flow is achieved. Upon leaving the chlorine contact chamber, the flow is then de-chlorinated prior to discharge into the Avon River.

The treatment plant also experienced 5 bypass events due to surges in flows from heavy precipitation, snow melt or UV System Channel maintenance activities. A total volume of 161,420 m³ was bypassed during these events. Not all bypassing flow was disinfected through the facilities UV system; 77,600 m³ of bypassing flow was disinfected through the UV system. The flow bypassed during the UV System channel maintenance received treatment utilizing a temporary chlorinating and de-chlorination system set up for this time period. All bypass events were reported to the MECP; the UV System channel maintenance bypass activity was approved in advance of the bypass.

Effluent Quality -The effluent discharges met all requirements for levels of removal for 2020:

- Total Suspended Solids: 98.5 %
- Total Phosphorus: 98.4 %

Capital Projects – The following are some of the more major capital projects undertaken for the 2020 year:

- Replacement of underdrains and media for filter #4
- Replacement of variable frequency drive (VFD) for raw sewage pump #3
- Clean out and maintenance of aeration cell #3
- Rebuilding filter service wash pump #2
- Replacement of backwash and filter effluent actuators and valves for filter #4
- Replacement of the primary effluent flowmeter
- Ongoing updates to the facility's SCADA system to improve process and time efficiency.

In summary, the Water Pollution Control Plant, operated by OCWA, has met, and exceeded all Environmental Compliance Approval requirements for the 2020 operating year

Financial Impact: Capital works and the cost of operating the Water Pollution Control Plant is financed through the Sanitary Sewer Surcharge rate.

Alignment with Strategic Priorities

Developing our Resources

Optimizing Stratford's physical assets and digital resources. Planning a sustainable future for Stratford's resources and environment.

Staff Recommendation: THAT the 2020 Stratford Water Pollution Control Plant Annual Report be received for information to ensure transparency between the owner and operating authority.



Johnny Bowes, Manager of Environmental Services



Ed Dujlovic, Acting Director of Infrastructure and Development Services



Joan Thomson, Chief Administrative Officer

2020 Annual Performance Report



OCWA's 2020 ANNUAL PERFORMANCE REPORT
to the City of Stratford
March 31, 2021

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SECTION 1: EXECUTIVE SUMMARY

Overview



Water quality is essential to the health of the local water fowl and the aquatic ecosystem of the Avon River. The Ontario Clean Water Agency (OCWA) has operated and maintained the Stratford Water Pollution Control Plant (WPCP) in a reliable, consistent manner to ensure compliant wastewater treatment for the City of Stratford since 1958.

2020 Results

The Stratford WPCP consistently produced high quality effluent that met or exceeded all required limits of the plant's Environmental Compliance Approvals (ECA) in 2020. The Stratford WPCP operates under ECA 9501-BG3JPF that was issued June 10, 2020. ECA 7526-B2UKVJ issued December 13, 2018 preceded the present approvals. No sampling related non-compliance issues occurred in 2020. There were multiple days of abnormally high flows into the plant in 2020 caused by excessive precipitation or snow melt in the area. High flows into the plant led to five storm tank overflow and four tertiary bypass events. Additionally the UV channel was bypassed in 2020 to facilitate channel maintenance.

In addition to meeting all regulatory limit targets, applicable highlights for 2020 were:

- Conducted comprehensive operational activities to monitor and control plant performance 24/7.
- Minimized risk of exceedances impacting effluent quality through ongoing in-house monitoring.
- Annual scheduled maintenance activities including inspections of lifting devices, backflow prevention equipment, emergency generator.
- Calibrations of flowmeters and gas meters or monitoring equipment throughout the facility.
- Successfully completed multiple repair and replacement capital projects totaling an approximate value of \$320,000.
- Capital projects included:
 - The replacement of underdrains and media for filter #4.
 - The replacement of the VFD (variable frequency drive) for raw sewage pump #3.
 - The clean out and maintenance of aeration cell #3.

- The replacement of the raw inlet electric actuator.
- Rebuilding filter surface wash pump #2.
- Replacement of backwash and filter effluent actuators and valves for filter #4.
- The replacement of the primary effluent flowmeter.
- Ongoing updates to the facility's SCADA system to improve process and time efficiency.
- Zero service disruptions occurred and one noise complaint was received in 2020.
- OCWA continued to promote the maintenance of a safe and healthy work environment for staff, contractors and visitors. OCWA implemented additional facility and personal checks and precautions in response to the COVID-19 pandemic.
- Produced anaerobically stabilized biosolids, meeting all the guidelines for agricultural land application under the Nutrient Management Act .

Looking Ahead

The future looks bright for the City of Stratford as we look forward to continued compliant wastewater treatment in 2021 and beyond. OCWA continues to improve operating practices and technologies to better predict and prepare for extreme weather events or other factors that have the potential to impact plant processes. We will also continue to develop and implement equipment repairs, replacements and other capital projects aimed at sustaining and improving plant performance.

OCWA continually invests in their people and those systems that support our clients. There is great value in our remote monitoring, data collection and asset management systems. OCWA completed a major investment commitment to expand data and asset management tools. Updated SCADA management tools implemented by OCWA allow operational staff remote access to historical and current data including process trending and plant optimization applications. OCWA's new and functional Asset Management System (Maximo) provides electronic access to equipment, asset details and the ability to schedule and track maintenance activities with timed accuracy for increased efficiency. The Maximo Work Management System was implemented at the Stratford WPCP in late 2016 and continues to evolve to meet plant and process needs and to promote optimization in the facility.

Section 8 of this report identifies a number of recommendations pertaining to asset repairs, replacements and recommendations which require capital investment. OCWA strives to deliver operational reports to the City of Stratford Manager of Environmental Services on a quarterly basis.

OCWA and the City of Stratford's community partnership focuses on protecting the Avon River and the broader environment through the effective treatment of wastewater at the Stratford Water Pollution Control Plant, process optimization, and the management of capital projects to sustain this goal. OCWA values its long-term partnership with the City of Stratford and looks forward to continuing operations for a successful future.

REPORT PREPARED BY:

Sean Beech
Senior Operations Manager
Ontario Clean Water Agency

SECTION 2: PROTECTING THE ENVIRONMENT

The City of Stratford and OCWA align their programs with community expectations with the major focus on protecting the Avon River watershed and keeping the local aquatic ecosystem healthy. OCWA operating procedures and its Quality and Environmental Management System (QEMS) describe activities we undertake to make sure ECA compliance limits are met.

Operational Activities Conducted

Operational activity highlights during 2020 include:

- Performing multiple facility operator process checks.
- Collecting and analyzing multiple wastewater samples at our on-site laboratory.
- Collecting and sending regulated required samples to external laboratories for detailed analysis.
- Reviewing Standard Operating Procedures (SOPs) for plant processes.
- Creating and updating Contingency Plans (CPs) for abnormal and emergency situations.
- Reviewing and updating process data management technology to maintain accuracy.
- Continuing to optimize the Maximo Asset Work Management System.
- Accommodating internal process audits.
- Completing required monthly facility Health and Safety Inspections .
- Completing 277 preventive and routine maintenance work orders; work orders are scheduled and tracked through the OCWA Maximo Work Management System.
- Completing and submitting compliance reports, including this annual performance report.
- Meeting on a regular basis with City of Stratford representatives.

All Regulatory Targets Met

The City of Stratford Water Pollution Control Plant is equipped and operated to meet stringent regulatory requirements issued from the Ministry of Environment, Conservation and Parks (MECP) and designed to protect the Avon River's aquatic ecosystem. All effluent water regulated limits identified for this facilities ECA were met in 2020.

The plant achieved the following important water quality indicators:

- Total Suspended Solids (TSS) is an indicator of the concentration of solid particles in the wastewater effluent and a determinant of the level of water clarity which, if reduced, can inhibit the ability of aquatic organisms to find food. Plant treatment removed 98.5% of raw wastewater TSS.
- Total Phosphorus (TP) in excess amounts causes an increase in algae and aquatic plant growth and causes eutrophication; the decomposition process can deplete oxygen levels and create adverse effects on aquatic fauna and restriction on recreational use of waterways. Plant treatment removed 98.4% of phosphorous from the raw wastewater.

Table 1.0 below is a summary of the treatment results achieved in 2020 compared to the Effluent Limits identified in the plant's Environmental Compliance Approval (ECA) Number 9501-BG3JPF issued June 10, 2020 (preceding ECA 7526-B2UKVJ issued December 13, 2018). There were no effluent limit exceedances in 2020.

Table 1.0: Effluent Water Quality Parameters - Limits vs. Results

Effluent Quality Parameter	Environmental Compliance Approval Effluent Concentration Limits	Average Annual Concentration Results & Maximum Monthly Concentration	#of Exceedances with ECA Concentration Limits
Carbonaceous Biochemical Oxygen Demand (CBOD ₅ - mg/L)	10.0 mg/L Monthly Average	Annual Monthly Average: < 2.5 mg/L Max. Monthly Average: 6.0 mg/L	0/12
Total Suspended Solids (TSS - mg/L)	10.0 mg/L Monthly Average	Annual Monthly Average: < 4.1 mg/L Max. Monthly Average: 9.5 mg/L	0/12
Unionized Ammonia	0.1 mg/L 0.2 Monthly Average 0.3 mg/L 0.4 Single Sample Result	Annual Monthly Average: 0.001 mg/L Max. Monthly Average: 0.001 mg/L Maximum Single Sample: 0.003 mg/L	0/12 0/52
Total Phosphorous (TP - mg/L)	0.2 mg/L Monthly Average	Annual Monthly Average: 0.07 mg/L Max. Monthly Average: 0.09 mg/L	0/12
E-Coli (Geometric Mean Density in CFU/100 mL)	200 CFU per 100 mL	Annual Monthly Average: 4 CFU/100 mL Maximum Monthly GMD: 7 CFU / 100 mL	0/12
pH	6.0 - 9.5 Inclusive Single Sample Result	Min. - Max. 6.39 - 7.76	0/365
Dissolved Oxygen	Minimum 4.0 mg/L Single Sample Result	Min. - Max. 7.06 - 12.46mg/L	0/315

Table 1.1 below is a summary of the treatment results achieved in 2020 compared to the Effluent Limit Loadings identified in the plant's Environmental Compliance Approval (ECA) Number 9501-BG3JPF issued June 10, 2020 (preceding ECA 7526-B2UKVJ issued December 13, 2018). There were no effluent limit loading exceedances in 2020.

Table 1.1: Effluent Water Quality Parameters - Design Loading vs. Results

Final Effluent Parameter	Limit (maximum unless otherwise indicated)	Monthly Average & Maximum Monthly Effluent Loading Concentration	# of Exceedances
CBOD₅	306 kg/d	Average: < 33.6 kg/d Maximum Monthly: 62.13	0/12
Total Suspended Solids	306 kg/d	Average: < 53.8 kg/d Maximum Monthly: 96.95	0/12
Total Phosphorus	6.1 kg/d	Average: < 0.93 kg/d Maximum Monthly: 1.44	0/12
Un-ionized Ammonia	3.06 kg/d	Average: 0.016 kg/d Maximum Monthly: 0.0016 kg/d	0/12

Table 1.2 below is a summary of the treatment results achieved in 2020 compared to the Effluent Objectives identified in the plant's Environmental Compliance Approval (ECA) Number 9501-BG3JPF issued June 10, 2020 (preceding ECA 7526-B2UKVJ issued December 13, 2018). The effluent design objectives were met in greater than 50% of the sample results and there are no indications of deteriorating effluent water quality.

Table 1.2: Effluent Water Quality Parameters - Design Objectives vs. Results

Effluent Quality Parameter	Environmental Compliance Approval Concentration Objectives	Average Annual Concentration Results & Maximum Monthly Concentration	#of Exceedances with ECA Concentration Limits
Carbonaceous Biochemical Oxygen Demand (CBOD ₅ - mg/L)	5.0 mg/L monthly average	Annual Monthly Average: < 2.5 mg/L Max. Monthly Average: 6.0 mg/L	1/12
Total Suspended Solids (TSS – mg/L)	5.0 mg/L monthly average	Annual Monthly Average: < 4.1 mg/L Max. Monthly Average: 9.5 mg/L	2/12
Unionized Ammonia	0.08 mg/L monthly average	Annual Monthly Average: 0.001 mg/L Max. Monthly Average: 0.001 mg/L Maximum Single Sample: 0.003 mg/L	0/12 0/52
Total Phosphorous (TP - mg/L)	0.1 mg/L monthly average	Annual Monthly Average: 0.07 mg/L Max. Monthly Average: 0.09 mg/L	0/12
E-Coli (Geometric Mean Density in CFU/100 mL)	150 CFU/100 mL monthly average	Annual Monthly Average: 4 CFU/100 mL Maximum Monthly GMD: 7 CFU / 100 mL	0/12
pH	6.5 - 8.5 inclusive	Min. - Max. 6.39 - 7.76	2/365
Dissolved Oxygen	5.0 mg/L	Min. - Max. 7.06 - 12.46mg/L	0/315

Plant Overflow & Bypasses Well-Managed

Five Primary Treated Overflow events and five Tertiary Bypass events occurred at the Stratford WPCP during the 2020 calendar year. The overflow events occurred on January 11th, March 9th, March 29th, May 18th and December 30th of 2020. All the overflow events were the result of heavy precipitation or snow melt in the area. The bypassing events occurred on January 11th, January 19th, January 27th, March 3rd and May 25th, 2020. Details of the events are below.

Overflow Events

1) Overflow Event January 11-15, 2020

A Stratford WPCP Primary Treated Overflow occurred January 11-15, 2020. The overflow started on January 11, 2020 at 09:10 and ended on January 15, 2020 at 23:00. The process overflowed for 133 hours and 50 minutes. The overflow occurred at the wet weather equalization tank. A total volume of 289,760 m³ overflowed and discharged to the Avon River. The overflow was the result of snow melt and precipitation in the area. This Stratford WPCP overflow did not negatively affect the receiving river.

2) Overflow Event March 09-13, 2020

A Stratford WPCP Primary Treated Overflow occurred March 09-13, 2020. The overflow started at 15:45 on March 09, 2020 and ended at 20:00 on March 13, 2020. The process overflowed for 100 hours and 15 minutes. The overflow occurred at the wet weather equalization tank. A total volume of 94,127 m³ overflowed and discharged to the Avon River. The overflow was the result of snow melt and precipitation in the area at this time. This Stratford WPCP overflow did not negatively affect the receiving river.

3) Overflow Event March 29-30, 2020

A Stratford WPCP Primary Treated Overflow March 29-30, 2020. The overflow started at 14:00 March 29, 2020 and ended at 22:10 on March 30, 2020. The process overflowed for 32 hours and 10 minutes. The overflow occurred at the wet weather equalization tank. A total volume of 19,578 m³ overflowed and discharged to the Avon River. The overflow was the result of heavy precipitation in the area at this time. This Stratford WPCP overflow did not negatively affect the receiving river.

4) Overflow Event May 18 –19, 2020

A Stratford WPCP Primary Treated Overflow occurred May 18, 2020 to May 19, 2020. The overflow started at 21:30 May 18, 2020 and ended at 13:30 on May 19, 2020. The process overflowed for 16 hours. The overflow occurred at the wet weather equalization tank. A total volume of 4,954 m³ overflowed and discharged to the Avon River. The overflow was the result of heavy precipitation in the area at this time. This Stratford WPCP overflow did not negatively affect the receiving river.

5) Overflow Event December 30, 2020 – January 1, 2021

A Stratford WPCP Primary Treated Overflow occurred December 30 - 31, 2020. The overflow started at 18:50 on December 30, 2020 and ended at 02:00 on January 01, 2021. The process overflowed for 31 hours

and 10 minutes. The overflow occurred at the wet weather equalization tank. A total volume of 16,208 m³ overflowed and discharged to the Avon River. The overflow was the result of heavy precipitation and snow melt in the area. This Stratford WPCP overflow did not negatively affect the receiving river.

This overflow event covered two separate annual report periods; total volume overflowed applicable to this 2020 annual report was 15,100 m³.

Bypass Events

1) Bypass Event January 11, 2020

A Stratford WPCP bypass started at 09:10 on January 11, 2020 and ended at 16:30 on January 11, 2020. The tertiary treatment filter system was bypassed. This tertiary bypass was the result of a surge in flows from heavy precipitation and snow melt causing the bypass actuator valve to open. The tertiary bypass flow was directed through the UV system for disinfection. This bypass event lasted for 7 hours and 20 minutes. A total volume of 7,700 m³ of plant flow bypassed the tertiary filters. The bypass did not negatively affect the quality of the final effluent.

2) Bypass Event January 18-19, 2020

A Stratford WPCP bypass started at 13:50 on January 18, 2020 and ended at 08:00 on January 19, 2020. The tertiary treatment filter system was bypassed. This tertiary bypass was the result of a surge in flows from heavy precipitation and snow melt causing the bypass actuator valve to open. The tertiary bypass flow was directed through the UV system for disinfection. This bypass event lasted for 17 hours and 50 minutes. A total volume of 19,800 m³ of plant flow bypassed the tertiary filters. The bypass did not negatively affect the quality of the final effluent.

3) Bypass Event January 26-27, 2020

A Stratford WPCP bypass started at 13:00 on January 26, 2020 and ended at 08:00 on January 27, 2020. The tertiary treatment filter system was bypassed. This tertiary bypass was the result of a surge in flows from heavy precipitation and snow melt causing the bypass actuator valve to open. The tertiary bypass flow was directed through the UV system for disinfection. This bypass event lasted for 19 hours. A total volume of 17,100 m³ of plant flow bypassed the tertiary filters. The bypass did not negatively affect the quality of the final effluent.

4) Bypass Event March 03-05, 2020

A Stratford WPCP bypass started at 17:00 on March 03, 2020 and ended at 08:00 on March 05, 2020. The tertiary treatment filter system was bypassed. This tertiary bypass was the result of a surge in flows from heavy precipitation and snow melt causing the bypass actuator valve to open. The tertiary bypass flow was directed through the UV system for disinfection. This bypass event lasted for 39 hours. A total volume of 33,000 m³ of plant flow bypassed the tertiary filters. The bypass did not negatively affect the quality of the final effluent.

5) Bypass Event May 25, 2020 to June 01, 2020

A Stratford WPCP pre-approved bypass was started at 10:00 on May 25, 2020 and ended at 09:30 on June 01, 2020. The UV Disinfection System was bypassed to accommodate UV channel maintenance activities; the UV channel was cleaned and painted. The bypass flow was treated utilizing a temporary chlorinating-dechlorination system. This bypass event lasted for 167 hours and 30 minutes. A total volume of 83,820 m³ of plant flow bypassed the UV Disinfection System. The bypass did not negatively affect the quality of the final effluent.

Processes Controlled to Produce Safe Effluent and Reusable Biosolids

Wastewater is collected from the more than 32,000 residents in the City of Stratford as well as industries, commercial establishments and institutions. The wastewater collection system within the City conveys the wastewater using gravity and pumping stations to the Water Pollution Control Plant. OCWA's operators treat and manage the wastewater along the following path:

- Receiving the raw sewage influent into the plant for treatment during regular flow levels. If flows are above the rated plant capacity during heavy precipitation or snow melt events, the extra flow is diverted to the wet weather flow equalization tanks. When the rain and/or snow melt subsides, the wastewater is then diverted back into the plant to be treated.
- Screening the raw wastewater influent to remove large objects through preliminary treatment.
- Removing grit from the wastewater utilizing a grit removal system.
- Settling out of large settleable solids in the primary clarifiers and removing the settled out materials (primary sludge) for further processing through primary and secondary digestion.
- Utilizing an aeration system to supply the oxygen needed for microorganisms to metabolize dissolved and suspended organic matter in the wastewater. This process reduces the Biochemical Oxygen Demand (BOD) and returns excess materials (waste and return activated sludge) as needed to keep the process in balance.
- Final settling of remaining particles and removing the settled materials using a rapid sludge removal process; some sludge is returned back to the front of the aeration process (return activated sludge) while any excess (waste activated sludge) is returned to the primary clarifiers for further processing along with the settled sludge in the primary clarifiers.
- Filtering the liquid effluent from the final settling tanks using a multi-media filtration system.
- Irradiation of the final effluent using ultraviolet lighting system.
- Sludge removed from the primary and final settling processes is digested and stabilized to ensure it is safe for eventual application to agricultural land as a soil fertilizer .
- Phosphorus is removed during the treatment process through the addition of ferrous chloride. This chemical is added into the aeration process.

Quality Assurance Part of Day-to-Day Operations

Effluent quality is assured on an ongoing basis by monitoring process parameters, analyzing the relationship between various parameters and examining any changes and trends that may have an impact on effluent quality.

Operators perform a number of tests on plant fluids throughout the process. Mixed liquor, raw or settled wastewater and activated sludge samples are monitored daily through in house lab analysis. Mixed liquor sample analysis includes the measurement of dissolved oxygen, pH, temperature, 30-minute settling and total suspended solids (MLSS) testing. Monitoring of ferrous chloride dosages and wasting volumes are completed daily.

Final effluent is analyzed within the facility lab to ensure effluent quality is not compromised. In-house final effluent testing includes analysis of dissolved oxygen, pH, temperature, total phosphorus and total ammonia.

The biosolids process is continuously monitored. Volatile acid and alkalinity testing is completed monthly on primary digester effluent to monitor the health of the digestion process. Total suspended and volatile suspended solids are measured regularly.

Data collected from in-house sampling analysis provides valuable information for operational staff to determine appropriate treatment adjustments required or corrective actions needed to meet ECA effluent limits and objectives.

MECP Inspections

The last Ministry of Environment Conservation & Parks Inspection was completed on April 16, 2016 and all follow up actions were completed as required. There were no MECP inspections completed during this report period.

MOL Inspections

The last Ministry of Labour inspection of the Stratford Water Pollution Control Plant occurred on September 12, 2018. All action items have been resolved. There were no MOL inspections completed during this report period.

Summary and Interpretation

A review of all influent data and characteristics shows that there has been a slight increase in the amount of contaminants entering the water pollution control plant. Influent biological oxygen demand, total suspended solids, total phosphorus and total kjeldahl nitrogen levels all increased slightly from 2019 to 2020. The Stratford Water Pollution Control Plant percent removal of a contaminates has remained relatively constant therefore showing that the treatment processes within the facility are capable of handling the noted slight increase of contaminants entering the plant.

The average annual raw sewage inlet flows have remained fairly constant; see Appendix 1. There was a decrease in the volume of overflows discharging into the Avon River in 2020 compared to 2019; overflow discharge volume decrease by 15,743 m³. Refer to Appendix 2; the fluctuations over multiple years are visible.

Processed organic waste volume has increased only slightly from the previous year suggesting that the facility aeration process is working very efficiently to breakdown large organic solids and therefore reduce the amount of waste activated sludge being returned to the primary clarifiers.

Final effluent concentrations remained fairly consistent throughout 2020. Seasonal fluctuations remain very low as consistent monitoring by operational staff reduces sporadic changes in the final effluent quality. Final

effluent concentration limits and loadings levels continue to be below the ECA identified compliance values. The 2020 annual average total phosphorus value is below the ECA Design Objective value. Monitoring of the phosphorus removal treatment processes and operational adjustments made by operational staff strive to achieve levels below the design concentration monthly objectives. Refer to the graphs below in Section 10: Flow and Water Quality Data.

The process monitoring Sampling Schedule was followed throughout the 2020 calendar year with no significant deviations from the prepared schedule; additional sample collections were made when applicable due to process challenges and as per facility ECA. As well additional samples were collected in 2020 during identified overflow and bypass events.

The ECA identified monthly and weekly samples were collected and sent to an accredited laboratory for analysis; in house lab analysis is performed by competent staff as required. Biosolids sampling was completed on a monthly basis to ensure required analysis is completed before land application ensues. Acute lethality testing of the final effluent is completed on an annual basis as required.

A facility monitoring schedule was developed per ECA requirement that ensure staff meet regulated sample collections and process monitoring requirements. Operational staff complete daily on site facility rounds and checks. The combination of a developed monitoring schedule, onsite checks and in house sample analysis provides compliant continual close monitoring of all processes within the plant and opportunities for process optimization as needed.

All planned and predictive maintenance is completed as required utilizing the work management system (Maximo).

There were minimal operating issues encountered during the 2020 calendar year at the Stratford WPCP. Limited operational challenges were the result of the OCWA planned preventative maintenance program in place utilizing the work management system (Maximo) that results in the timely completion of maintenance activity and early operator identification of issues.

The City of Stratford has undertaken multiple efforts in their system to reduce the number of Overflow and Bypass Events at the Stratford WPCP. Approximately 700 metres of sanitary pipes were replaced in 2020 to inhibit infiltration of groundwater in to the sewage collection system. The City plans to replace 500 metres of sanitary sewer in the collection system in 2021.

SECTION 3: RESPONSIBLE FACILITY MAINTENANCE & STEWARDSHIP

The City of Stratford owns all wastewater facilities used to transport and treat Stratford's wastewater. The Ontario Clean Water Agency is the contracted Operating Authority who operates and maintains the facility that receives and processes the City of Stratford's wastewater.

Facilities under OCWA's Stewardship

Wastewater system facilities and equipment under OCWA's stewardship extend from the influent structure to the final effluent discharge point. The City of Stratford Water Pollution Control Plant (WPCP) is a

conventional activated sludge facility which uses anaerobic digestion to stabilize its wastewater solids. The Stratford Water Pollution Control Plant's major components include the following:

- raw sewage pumping station;
- two wet weather flow equalization tanks;
- overflow chlorination and de-chlorination systems;
- preliminary treatment using two automatic bar screens;
- grit removal system;
- four primary settling tanks (clarifiers);
- four aeration tanks equipped with fine pore ceramic diffusers;
- three final settling tanks (clarifiers) with rapid sludge removal;
- four dual-media filters;
- ultraviolet irradiation system;
- one primary anaerobic digester and one secondary anaerobic digester;
- one sludge storage tank and one storage lagoon;
- two ferrous chloride chemical storage tanks equipped with three chemical feed pumps;
- one standby diesel generator.

Equipment and systems required to properly operate and maintain the Stratford Water Pollution Control Plant, include:

- mechanical systems (e.g. pumps, valves, mixers, screens, augers);
- electrical systems (e.g. power supplies);
- instruments (e.g. flowmeters, level and pressure transmitters, etc.);
- control systems (e.g. Supervisory Control & Data Acquisition Systems (SCADA), Programmable Logic Controllers (PLC));
- information technology systems (e.g. work management system (Maximo), process data management system (WISKI).

The wastewater system also includes ten sanitary sewage pumping stations and one storm-water pumping station. These stations are located throughout the City and operated and maintained by the City of Stratford's Wastewater Department.

Operations and Maintenance Work Prioritized and Scheduled

All operations and maintenance work at the plant is requested, scheduled, completed and documented using OCWA's work management system (WMS) called Maximo. Maintenance work to be completed may be identified by a plant operator, mechanic or electrician and is documented using a work order. Following approval of a work order, the work order is assigned to required personnel. Planned or preventative work

orders can be scheduled and generated automatically by the WMS; examples include weekly sample collections, monthly greasing and lubrication of equipment and annual pump oil changes.

The work management system (Maximo) contains an abundance of important data in regards to plant assets and specific maintenance procedures. This system helps identify when an asset reaches the point where it is most cost-effective to perform rehabilitation work or replacement. The WMS can also be utilized to store equipment operations manuals and inspection reports.

The work management system (Maximo) identifies risk and impact-based priorities that help determine the order in which maintenance and operational activities are completed. The prioritization method in the system considers factors such as risk, safety, environmental, customer, operations, financial and urgency. Work order requests are prioritized to ensure that top priority work is being pursued at all times.

The OCWA work management system (Maximo) identifies three types of work orders.

1. Emergency Work Orders:

Emergency work orders usually involve safety hazards, environmental concerns or a major interruption of service; repairs are often initiated without waiting for work orders to be processed.

2. Planned or Preventive Work Orders:

Maintenance work orders that do not require prioritizing as it is always scheduled and built into the regular work schedule.

3. Breakdown or Corrective Work Orders:

Maintenance work that is prioritized, planned and scheduled into the regular preventive maintenance program.

The preventive maintenance and corrective maintenance work requests are added to the schedule according to their priority, the workload of staff and the availability of any required outside contractors. The following table shows the number of preventive work orders generated and completed in 2020.

Table 2: Routine and Preventative Maintenance Work Orders Completed in 2020

Month	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
# of WO	26	28	17	31	21	19	22	16	21	29	27	20

OCWA's ongoing investment in our information technology and asset management tools will continue to provide sound monitoring and detailed support for asset protection and for the long-term health of the system.

Equipment Inspection & Instrument Calibration

There were a number of planned calibrations and inspections completed in 2020, including:

- meters: influent flowmeter, final effluent flowmeter, overflow flowmeter and level transmitters (calibrated by Pierce Services and Solutions Inc.);
- hand held and laboratory equipment (calibrated by Pierce Services and Solutions Inc.);

- backflow preventers (inspected by Turner Plumbing and Heating);
- lifting equipment/devices (inspected by Kone Cranes);
- personal lifting devices (inspected by Hamisco Industrial);
- gas monitoring equipment (calibrated by Hetek Solutions Inc.);
- emergency generator (inspected and serviced by Sommers);
- fire extinguishers (inspected by Mobile Fire and Safety);
- in-house meters for pH and dissolved oxygen (calibrated by competent OCWA operators as per manufacturer's instructions);
- Health and Safety (inspections completed monthly by a trained OCWA Health and Safety representative).

SECTION 4: CAPITAL PROJECTS AND PERFORMANCE IMPROVEMENTS

2020 Annual Capital Repair and Replacement Projects

The following is a summary of capital work undertaken by OCWA at the Stratford WPCP in 2020. This work was performed under OCWA's direction and coordinated in a way to ensure the plant continued to operate at an optimum level during any on-site construction activities. Each project was identified in the rolling 6-year capital improvement plan for the wastewater plant.

OCWA was responsible for identifying, designing and successfully implementing a number of important repairs and replacement projects on behalf of the City in 2020. The table below shows the projects completed and the benefits for the City.

Table 3: Capital Projects for 2020 managed by OCWA

Capital Project	Maintain Day To Day Operations	Reduce Risk	Increase Efficiency	Reduce Cost	Improve Health & Safety
Raw sludge pump rotor and stator	X	X	X		
Turbo blower software upgrade/maintenance	X	X	X	X	
Aeration #3 clean out and maintenance	X	X	X	X	
Filter #4 backwash/effluent actuator and valve replacement	X	X			
Raw sewage pump #3 VFD replacement	X	X	X	X	
Service agreements on generator, backflow preventers, fire extinguishers, etc.	X	X	X	X	
Surface wash pump #1 pump rebuild (mechanical seals and O-rings)	X	X	X	X	

Capital Project	Maintain Day To Day Operations	Reduce Risk	Increase Efficiency	Reduce Cost	Improve Health & Safety
UV channel coating	X	X	X	X	X
Raw inlet actuator replacement	X	X	X		X
Filter #4 underdrain and media replacement	X	X	X	X	
Raw Sewage Pump #3 check valve replacement	X		X	X	
Upgrades to the SCADA system, installation of new analog output cards and the purchase of new HMI touchscreens	X	X	X	X	

SECTION 5: RESPONSIVE CUSTOMER SERVICE

OCWA staff are committed to protecting the Stratford community and its environment 24 hours per day, 365 days per year. Our licensed wastewater operators provide this service during regular working hours and on call after hours in case of an emergency. OCWA staff operating the Stratford WPCP have ongoing access to OCWA's unique province-wide Operational Emergency Response Team and a team of technical and engineering experts who can be on site if needed.

Customer Inquiries

OCWA staff are always available to respond to any questions from City of Stratford representatives. OCWA uses the latest in mobile and integrated technologies to access the necessary information quickly and effectively. OCWA analyzes data and monitors trends to predict situations before they occur so relevant information can be shared with City staff before problems occur.

Essential Services Status Means No Labour Disruption

OCWA's operations staff are covered under an Essential Services Agreement that guarantees the City of Stratford will not experience any labour disruption during our partnership.

SECTION 6: SAFE & HEALTHY WORK ENVIRONMENT

The health and safety of our staff, our contractors and any visitors to the Stratford wastewater facilities is of paramount importance. We are committed to providing a safe and healthy workplace for all employees, regularly promoting awareness and providing training at every level of the organization. Our Occupational Health and Safety Policy sets the foundation for the development, implementation and the continuous improvement of our Occupational Health and Safety System and related programs. OCWA services are provided in a professional and responsible manner.

At Stratford we achieved our target of zero lost time incidents in 2020. Additionally, our local staff each completed their MECP mandatory training including required 40 hours of operations training and 12 hours of specific health, safety and emergency preparedness training.

SECTION 7: OCWA CAPITAL RECOMMENDATIONS FOR 2021

There were a number of operational recommendations made for equipment rehabilitation and replacement required to ensure the plant continues to meet effluent compliance targets at an acceptable level of risk. We continue to consider a number of sources for the determination of capital priorities, including our Work Management System, the Comprehensive Performance Evaluation, the Energy Audit as well as the ongoing discussions with the City to make sure municipal priorities are considered. All projects are captured in an annually updated 6-year capital plan.

With the City's repair and replacement budget was set at \$499,500; the following capital items are recommended for 2021:

1. Annual equipment inspections (backflow preventers, emergency generator, lifting devices);
2. Filter backwash pump replacement;
3. Ferrous chloride pump replacement;
4. Raw sewage pump check valve replacement;
5. Digester boiler maintenance;
6. Equalization tank electric actuator replacement (Diversion Chamber to EQ Tanks);
7. Raw sewage pump rebuild;
8. Aeration tank #4 cleanout and maintenance;
9. Filter system actuator and valve replacement;
10. Repair/replacement parts inventory.

Additional projects will be completed based on a clear cost-benefit as discussed with and approved by City staff.

SECTION 8: PLANT DESCRIPTION

Summary

The Stratford Water Pollution Control Plant (WPCP) is a conventional activated sludge facility with tertiary treatment. The plant receives raw influent which is subject to pumping, screening, grit removal, and primary settling before it arrives at the aeration process; aeration tanks are equipped with fine pore ceramic diffusers. The liquids are then sent on for final settling with rapid sludge removal, before going through tertiary treatment filtration and ultraviolet irradiation.

Phosphorus is removed during the treatment process by injecting ferrous chloride at a single point in the process; dual point injection is available if required.

The waste solids are stabilized using a two-stage anaerobic digestion.

Wet weather flow is diverted from the distribution chamber to the wet weather flow equalization tanks and pumped back into the plant for treatment after the wet weather event has ended.

Table 4: Stratford Water Pollution Control Plant

Plant Fact / Category	Description
Facility Type	Conventional activated sludge, sand filtration as tertiary treatment, with UV disinfection. Chlorination and de-chlorination of storm water overflow events.
Design Capacity	30,660 m ³ /day
Receiving Water System	Avon River
Environmental Compliance Approval Number: (Issued Dec. 13, 2018 – Revoked June 10, 2020)	7526-B2UKVJ
Present Environmental Compliance Approval Number (Issued June 10, 2020)	9501-BG3JPF
Plant Classification	WWT-IV

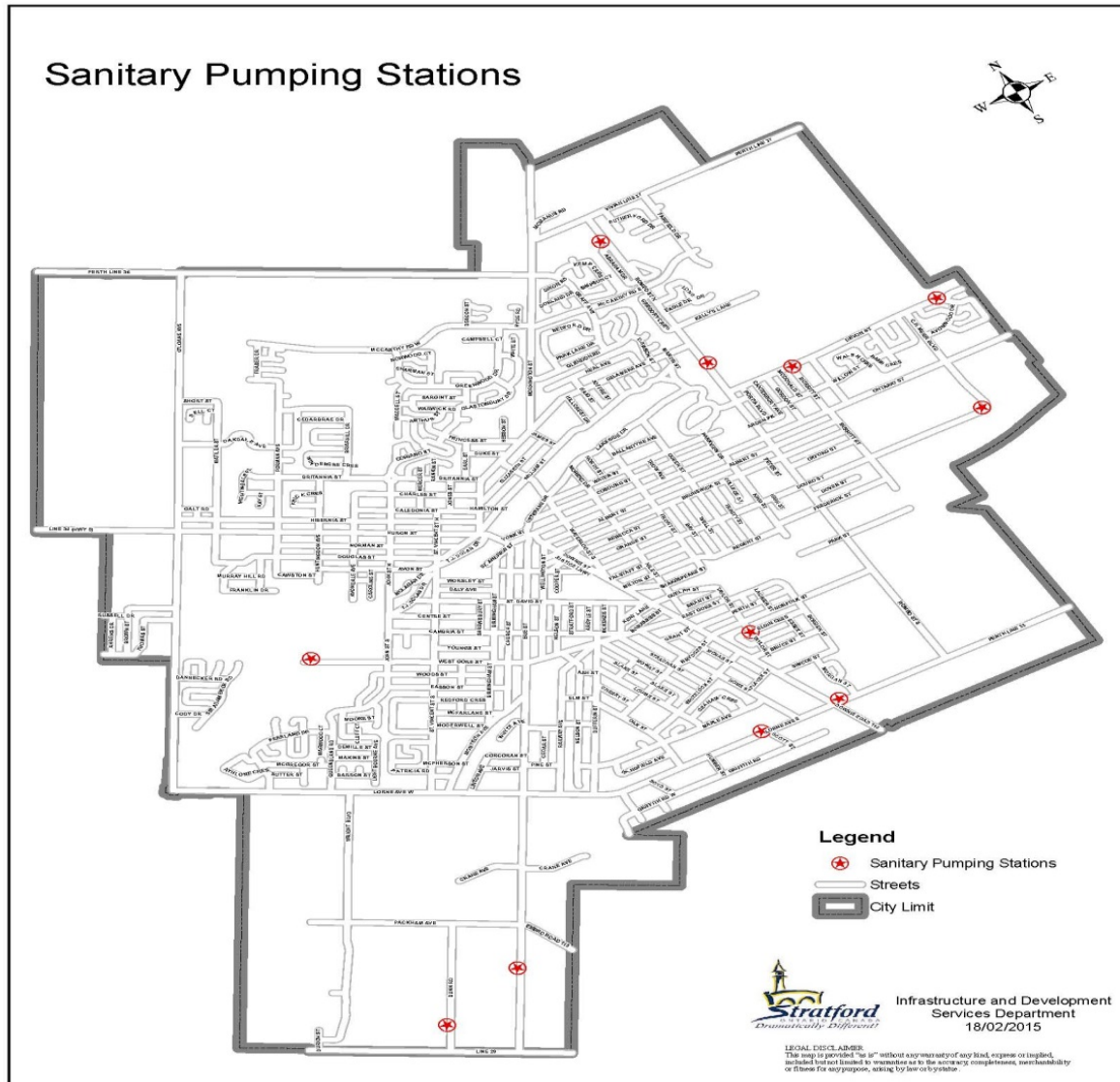
History

Improvements to the treatment facility were completed in 1996, 2004 and 2017. The 1996 improvements included the construction of a new wet weather flow equalization tank, upgraded the sewage pumping facilities, four new aeration tanks with fine bubble diffusion, one new secondary clarifier, modifications to the existing two secondary clarifiers, new chemical storage and delivery facilities, a new standby diesel engine and a generator capable of supplying 100% standby power for the site, new return sludge and waste sludge systems, metering and UV. The 2004 improvements included the modification to wet weather flow equalization tank number one with baffle walls, the construction of wet weather flow equalization tank number two, the addition of chlorination and de-chlorination facilities and miscellaneous controls, electrical equipment, instrumentation, piping, pumps and appurtenances essentials for the proper operation of the Water Pollution Control Plant. The 2017 improvements included primary clarifier upgrades and structural rehabilitation. A new diversion chamber was designed with the addition of four new stainless steel rotating sludge collection mechanisms, scum removal system, new bridges, electronic actuators and electrical panels with SCADA control.

Raw Wastewater Collection

The wastewater is collected by gravity and directed to the ten pump stations and one storm water pumping station located throughout the City of Stratford (see Fig. 1). The pump stations range from submersible pump operations to dry pit applications. All pumping stations are equipped with 2 pumps ranging in size from 1.5 horsepower to 29.0 horsepower. Six of the pumping stations are equipped with backup emergency generators while the other stations have stand by power hook ups for connecting a mobile emergency generator. The pumps are controlled by a two level control systems, a miltronics ultrasonic sensor and a float system. All pump stations are operated by the City of Stratford Wastewater Department and are equipped with alarm systems.

Figure 1: Stratford Sanitary Pumping Stations



Raw Wastewater Lift (raw sewage pumping) Station

The raw domestic wastewater is pumped from the pump stations to the raw sewage lift station located inside the gate at the WPCP treatment facility from the Forman/O'Loane and the Erie/Brydges/Worsley trunk sewers. The lift station is equipped with four Archimedean screw pumps; three screw pumps each having a capacity of 427L/s to handle peak dry weather flows and one screw pump with a capacity of 2,600L/s to handle wet weather flows.



Archimedean Screw Pump

Wet Weather Flow Equalization Tanks and Facility

The storm tank and storm diversion system was commissioned and put into service in 2004. Under the new operation, excess flows are diverted to the two equalization tanks and then to the chlorination contact tank during high flow events. Once all storage is full, excess flow begins to overflow the chlorination contact tank and the de-chlorinated primary treated effluent is discharged to the river. In these instances, the equalization tank acts as a primary clarifier (solids removal), providing primary treatment prior to the discharge to the Avon River.

Another storm tank was constructed beside the original tank on-site with a flushing system. A chemical building was constructed to house the sodium hypochlorite disinfection system and the sodium bisulphite de-chlorination system used for the treatment of overflow prior to discharging.

The two wet weather flow equalization tanks each have a capacity of approximately 6000 m³, with a sediment flushing system and a 300 mm diameter drain pipe connecting to the base of the raw sewage lift station. The overflow from tank 1 enters tank 2 which has baffle walls to provide an additional function for mixing during emergency wet weather overflow prior to discharge to the Avon River. In the event of a discharge to the Avon River, de-chlorination is achieved.

The overflow chlorination and de-chlorination facility consists of: chlorination and de-chlorination process equipment, controls and sampling equipment. The chlorination system for disinfection of emergency wet weather overflow includes two 15,000 L capacity sodium hypochlorite storage tanks and four 13.4 L/minute capacity metering pumps (one standby), chemical feed lines to the primary dosing point at the inlet chamber of the wet weather flow equalization tank # 1, equipped with an in-line mixer and a backup dosing point at the equalization tanks distribution chamber. The de-chlorination system for the emergency wet weather overflow includes one 3,000 L capacity sodium bisulphite storage tank and two 4.0 L/minute capacity metering pumps (one standby), chemical feed lines to the primary dosing point at the discharge channel of the wet weather flow equalization tank # 2, equipped with an in-line mixer and a backup dosing point at the bypass channel of the wet weather flow equalization tank # 2.

A SCADA system monitors all the flows entering the storm tanks and adjusts the chemical dosing rate based on the flow.



Figure 1: Chlorine Contact Chamber



Figure 2: Equalization Tanks

Influent Works

The flow from the raw water lift station flows through the distribution chamber and into the screening building. The building consists of two mechanical bar screens rated at a hydraulic peak flow of 450L/s, a dewatering screw auger to remove screenings, a grit handling facility and a metering chamber. The screening and the grit are removed and sent to the City of Stratford Landfill.



Figure 3: Automatic Bar Screens



Figure 4: Grit Removal System

Primary Clarification

The flow from the inlet works enters the distribution chamber with waste activated sludge being added to the stream for co-settling through 2 of 4 primary clarifiers under normal flow conditions, each clarifier with a capacity of 1,500m³. The primary treatment system consists of four circular primary clarifiers, of which two primary clarifiers are used as storage tanks during wet weather events. The primary clarifiers are designed to remove settled and floating solids from the wastewater stream, utilizing sludge collector mechanisms, and thereby reducing the organic load on the downstream biological treatment process. Settled sludge collects on the bottom of the primary clarifiers and is moved to the central hoppers by a rotating scraper mechanism. Scum and floatables from the surface of the clarifiers are collected by rotating surface skimmers and directed to the scum hoppers. Both the sludge and scum are pumped by two sludge pumps and macerated through in-line grinders to the primary anaerobic digester.

There are two raw sludge pumps rated at 10L/second, two in-line sludge grinders, three primary effluent submersible pumps rated at 210L/second and one dewatering pump rated at 50L/second.



Figure 5: Primary Clarifiers

Biological Treatment (Secondary Treatment)

The main purpose of the secondary treatment system is the removal of solids dissolved in the wastewater and removal of suspended solids that were not removed in the primary treatment. In the aeration process, the activated sludge process, bacteria utilize organic matter in the presence of dissolved oxygen for cell growth and reproduction. It is a biological treatment process that requires aerobic conditions and includes:

- **Carbonaceous Oxidation:** Biological conversion of carbonaceous matter in wastewater to cell tissue and various gaseous end products.
- **Nitrification:** Conversion of ammonia nitrogen to nitrites and then to nitrates.

The aeration system consists of four aeration tanks. Each tank is divided into three passes to provide a plug flow aeration pattern. This flow pattern is usually recommended for nitrifying systems. It provides flexibility to vary the air supply within the tanks allowing better oxygen transfer and Dissolved Oxygen (D.O.) control. It also optimizes power usage for aeration and improves sludge settleability. Aeration and mixing is provided by 12 grids of 944 ceramic disc fine pore diffusers per aeration tank.

- **Air Supply System:** consists of one duty APG Neuros 350HP Turbo Blower and two standby Hoffman 200HP centrifugal blowers that deliver compressed air to the aeration tanks and the diffuser air system.

- **Secondary Clarification:** There are three circular final clarifiers. Mixed Liquor enters the final clarifier influent distribution chamber and is distributed evenly to the three tanks. The symmetrical shape of the chamber and positioning of the weirs ensure an equal split of the flow to each clarifier. Mixed Liquor enters each of the final clarifier via a feed pipe located at the base of the clarifier. The feed pipe discharges within a circular feed well which acts as a baffle to deflect the incoming flow downwards and reduces short circuiting.

The final clarifier mechanism in each tank is classified as a rapid sludge removal type. The settled sludge is continuously removed from the tank bottom by pipes which are supported on two rotating trusses. Mechanical rake arms on the bottom of the trusses scrape the settled sludge towards the opening in the suction pipes. The eight suction pipes of each clarifier enter the sludge return box from below. A valve on each suction pipe is used to control the sludge flow rate into the box from each withdrawal pipe.

The settled sludge from the final clarifiers is identified as Return Activated Sludge. It is either returned to the main RAS header and further to the inlet chamber upstream of the aeration tanks or Waste Activated Sludge which is pumped to the discharge point in the primary settling tank inlet chamber. The Waste Activated Sludge then settles within the primary clarifiers and is pumped to the digesters.



Figure 6: Aeration System



Figure 7: Turbo Blower Air Supply



Figure 8: Final Clarifiers

Effluent Filtration

During normal operational conditions, secondary effluent is lifted by the Archimedean screws and flows into the filter box through the filter inlet gate. The effluent filtration system is rated at 30,660m³ per day, and consists of four rapid filters provided with two sub-surface agitators on each filter. The filters are designed to remove solids in the effluent discharged from the secondary clarifiers. In removal of the solids, some of the remaining BOD and phosphorus are also reduced. The solids accumulated in the filter are removed when the filters are backwashed; backwash wastewater is pumped to the primary clarifier inlet channel. In the process

of pumping to the primary clarifier inlet chamber, many of the solids removed by filtration are removed in the second routing through the plant by physical, chemical or biological flocculation and resultant sedimentation; as a result the finely divided solids do not accumulate in the plant.

The four filters are housed in rectangular concrete boxes arranged side by side. In the concrete boxes are longitudinal trenches with pipe connections that provide outlets for filtered effluent and also is the supply source for the backwash pump. The trenches are bridged by vitrified clay filter blocks that cover the floors of the filter boxes; three layers of media are placed on the filter blocks. Layer one consists of 310 mm of graded support gravel varying in size from 19 mm on the bottom to 2.5 mm on the top. Layer two is 350 mm of filter sand and layer three is 460 mm layer of anthracite. There are two rotating sub-surface agitators in each filter box. Each agitator arm is provided with 38 nozzles and is designed to mix the expanded media during the backwash operation in order to effectively scour the media and remove all accumulated solids. Water with at least 485 kPa is used to rotate the sub-surface agitator during the backwash operation.

The effluent passes down through the filter media and is collected in the clear well beneath the filters and flows into the UV disinfection building channel. The rate of flow through the filters can be controlled for each filter by the filter rate control valve or by the filter inlet gate. Once passed through the filter, the effluent flows via channel to the final effluent disinfection process.



Figure 9: Filter Room



Figure 10: Filter Model



Figure 11: Interior of Filter

Final Effluent Disinfection

The effluent is directed to the open channel ultra-violet (UV) disinfection system before being discharged to the Avon River.

Filtered effluent flows to the UV channel where it is disinfected by the UV light. The UV system consists of two banks each comprised of 21 modules with 8 lamps per rack, totaling 168 lamps per bank placed in series within one disinfection channel. In addition, one stand-by unit is stored in the UV system cleaning basin ready for use in the event there is failure in the active UV banks.



Figure 12: Ultraviolet Disinfection

Sludge Management System

The sludge stabilization system is a two-stage digestion process. The primary digester has a fixed cover and the secondary digester has a floating gas-holding cover. The system has been designed so that either unit can function as a primary digester if necessary.

These are essentially four key elements to the anaerobic digestion system:

- Sludge feed and supernatant withdrawal
- Sludge recirculation and heating
- Gas system and digester mixing
- Sludge withdrawal

Primary sludge is pumped from the primary settling tanks to the primary digester. The primary digester is maintained at a constant level. When sludge is pumped into the digester, excess sludge overflows into the primary tank supernatant overflow box. The lowest pipe in the overflow box connects to the transfer line that leads to the secondary digester. The second highest pipe connects to the supernatant return line to the inlet works (acts as an emergency overflow). The third pipe in the box is the feed line for the box from the primary digester.

The primary digester is gas mixed. The gas compressor located in the gas pump room continuously moves gas through the diffusers located in the bottom cone of the tank. This induces a rolling motion in the digester that provides complete mixing in the unit. Sludge is heated by pumping it through the heat exchanger and back to the primary digester. The sludge recirculation pump operates continuously in duty/standby mode. Hot water is fed to the heat exchanger to heat the primary sludge and is turned on and off automatically.

Once sludge is transferred to the secondary digester, it settles and thickens in the tank. Methane gas that is produced is stored in the gas holder cover. Methane gas is used as fuel to run the boiler system which supplies heat to the heat exchanger, which in turn keeps the anaerobic digester at a certain temperature. Any of the methane gas that is not used will burn off into the atmosphere through the waste gas burner.

Supernatant from the tank overflows in the secondary overflow box and is returned (by gravity) to the primary clarifier influent channel. Sludge can be sampled at various levels inside the digester by opening the appropriate valves in the sampling room.

Sludge is withdrawn from the bottom of the secondary digester and transferred to the sludge storage holding tank or sludge storage bed. Sludge is then withdrawn from the holding tank/bed and transferred to the truck loading bay by the transfer pumps. All sludge is removed and applied to agricultural land as per the NASM Guidelines.



Figure 13: 2 Stage Anaerobic Digestion (Primary on the left and Secondary on the right, boiler room in the middle)



Figure 14: Sludge Storage Tank

Standby Power

The WPCP has an automatic standby generator which will operate the plant when there is a power failure. This allows for continuous running of the plant when power outages occur.



Figure 15: Emergency Standby Power

SECTION 9: FLOW AND WATER QUALITY DATA

Flow and water quality data at the Stratford WPCP was monitored as per Environmental Compliance Approval #7526-B2UKVJ (revoked) and Approval # 9501-BG3JPF (issued June 10, 2020) requirements. Detailed monitoring data is supplied in **Appendix 4**.

Raw Wastewater Flow & Discharge Data

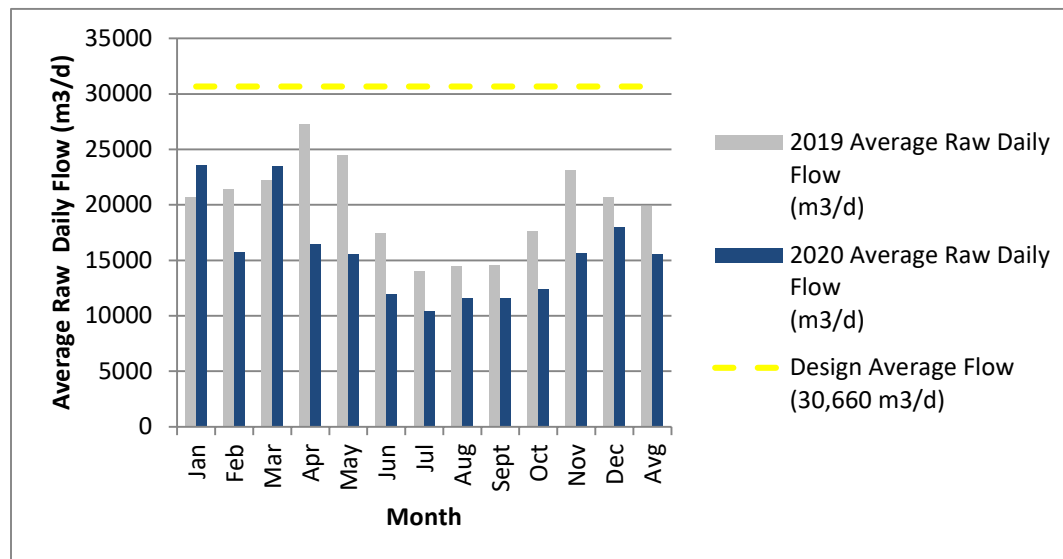
The table below summarizes the flow data for 2020.

Table 5: Stratford Water Pollution Control Plant Flows 2020

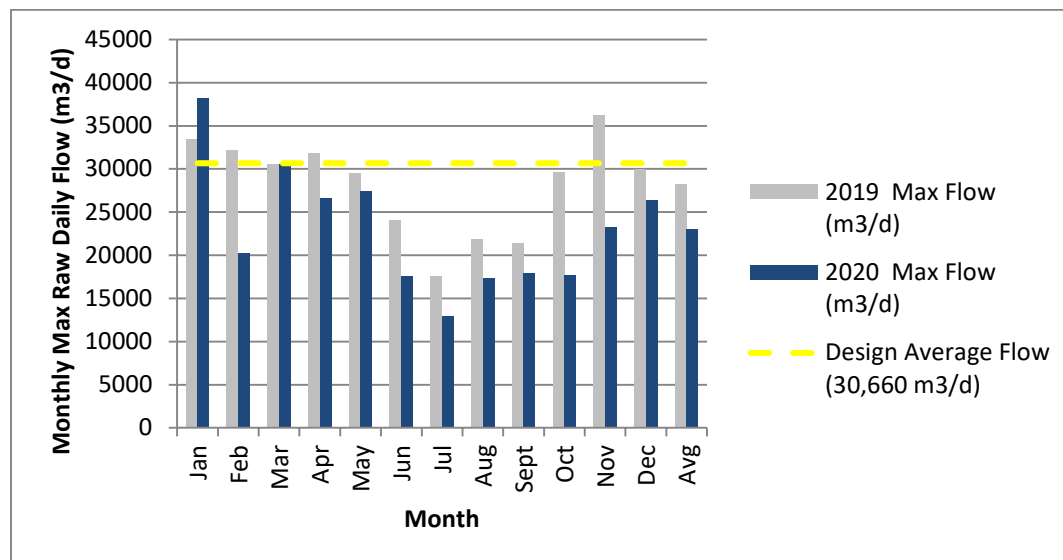
Flow Parameter	Value
Total Annual Wastewater Flow Treated (m ³)	5,088,366
Average Daily Raw Wastewater Flow (m ³ /d)	15,507
Average Daily Raw Wastewater Flow / Design Capacity (%)	51
Maximum Daily Raw Wastewater Flow (m ³)	38,200

The graph below shows the average daily flows during each month in 2020.

Graph 1: Average daily flows for each month in 2019-2020



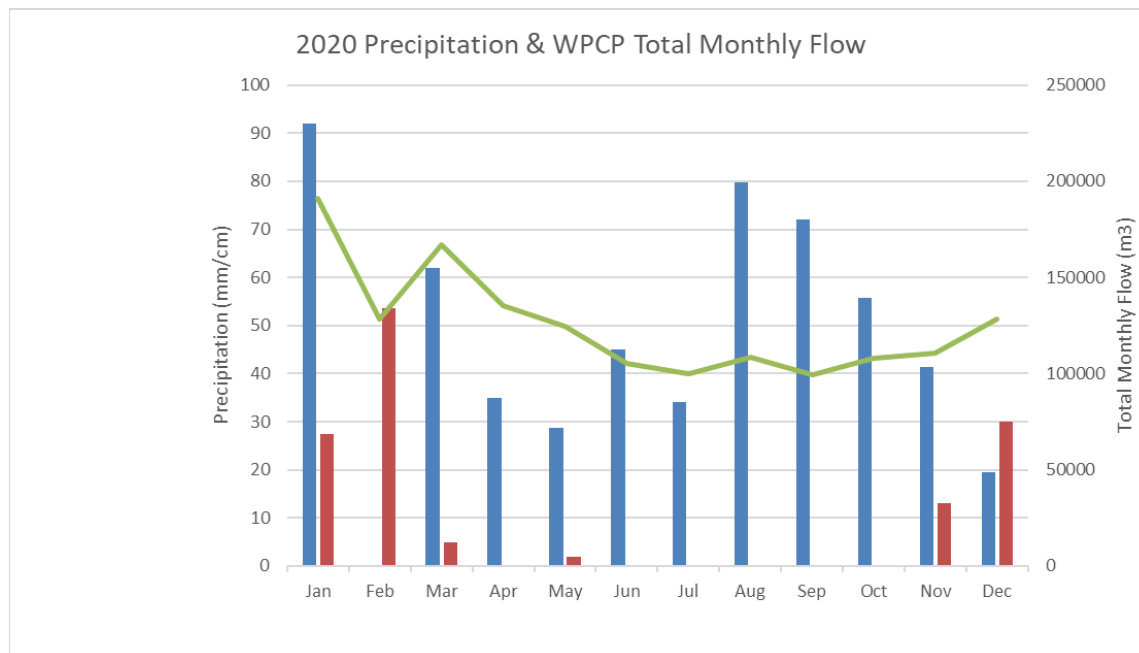
Graph 1.1: Maximum Daily Raw Sewage flows for each month in 2019-2020



There were 5 Primary Treated Overflow Events totaling over 16 days of discharge from the wet weather flow equalization tanks in 2020 due to flows caused by heavy precipitation and or snow melt. All Primary Treated Overflow Effluent received minimum primary treatment and disinfection and were reported to the MECP. A total of 423,519 m³ was discharged for a total of 311.4 hours. A summary of plant bypasses from 2010 to 2020 is provided in [Appendix 2](#).

There were 5 Tertiary Bypass events that occurred over 250.7 hours due to surges in flows from heavy precipitation, snow melt or UV System Channel maintenance activities. A total volume of 161,420 m³ was bypassed during these events. Not all bypassing flow was disinfected through the facilities UV system; 77,600 m³ of bypassing flow was disinfected through the UV system. The flow bypassed during the UV System channel maintenance received treatment utilizing a temporary chlorinating and de-chlorination system set up for this time period. All bypass events were reported to the MECP; the UV System channel maintenance bypass activity was approved in advance of the bypass.

Graph 2: 2020 Monthly Totals of Rain and Snow Data from the Stratford WPCP Weather Station



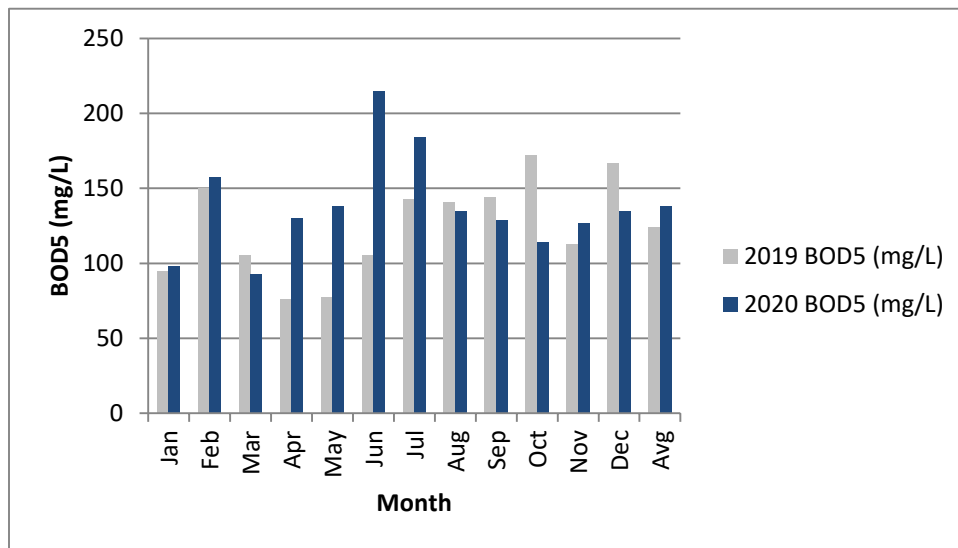
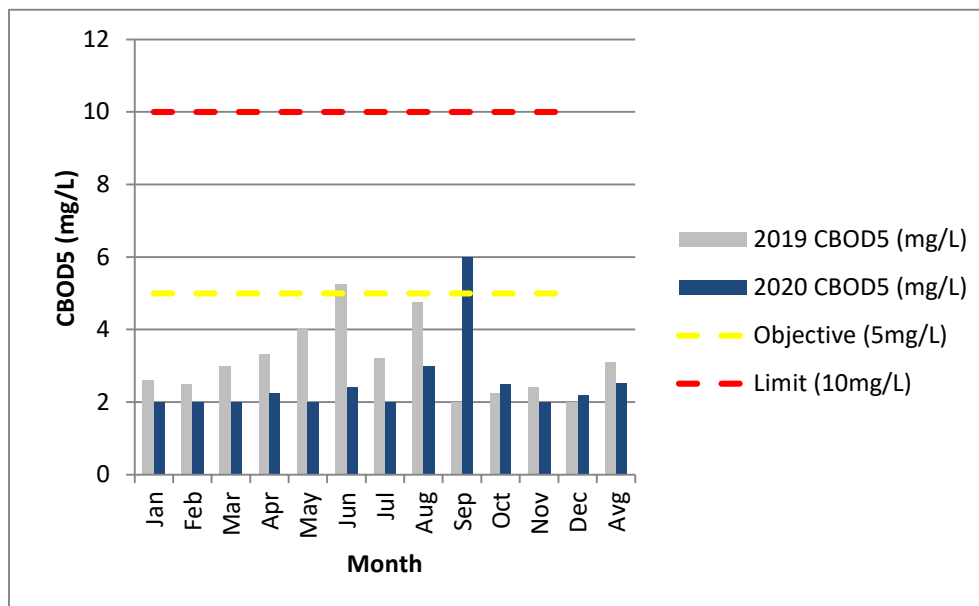
Wastewater Quality

The raw wastewater is analyzed weekly for BOD₅, total suspended solids, Total Kjeldahl Nitrogen and total phosphorus from a 24-hour composite sample.

The final effluent is monitored, sampled and tested weekly for Carbonaceous Biological Oxygen Demand (CBOD)₅, Total Suspended Solids (TSS), Total Phosphorus (TP), Total Kjeldahl Nitrogen (TKN), Nitrate, Nitrite and Total Ammonia Nitrogen (TAN) weekly by composite sample. E-coli, pH, Temperature and Dissolved Oxygen (DO) is monitored weekly by grab sample. Unionized ammonia is calculated weekly. Total Residual Chlorine or Bisulphite Residual is tested daily when in use. Refer to **Appendix 4** for more detailed monthly results.

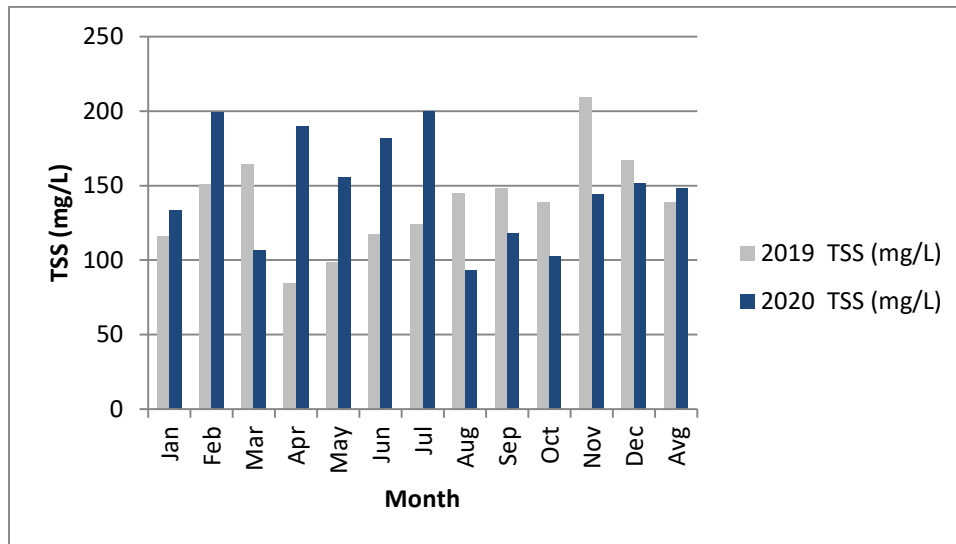
Biochemical Oxygen Demand (BOD) - Carbonaceous Biochemical Oxygen Demand (CBOD₅)

The annual average raw sewage BOD₅ concentration to the plant was 137.9 mg/L with a maximum concentration of 214.6 mg/L. The annual final effluent CBOD₅ concentration was < 2.53 mg/L with a maximum of 6.0 mg/L. Monthly Average CBOD₅ values are shown in the graph below.

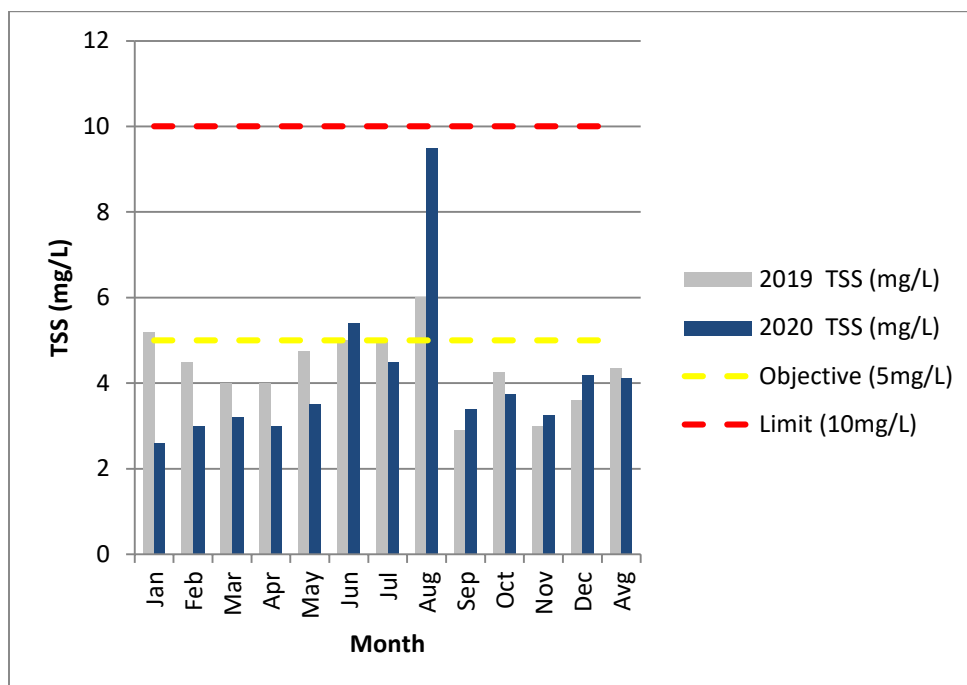
Graph 3.1: Raw Sewage BOD₅**Graph 3.2: Final Effluent CBOD₅****Total Suspended Solids (TSS)**

The annual average raw sewage total suspended solids (TSS) concentration to the plant was 147.9 mg/L, with a maximum concentration of 199.8 mg/L. The annual average final effluent TSS concentration was < 4.1 mg/L with a maximum concentration of 9.5 mg/L. Monthly Average TSS values are shown in the graph below.

Graph 4.1: Raw Sewage TSS



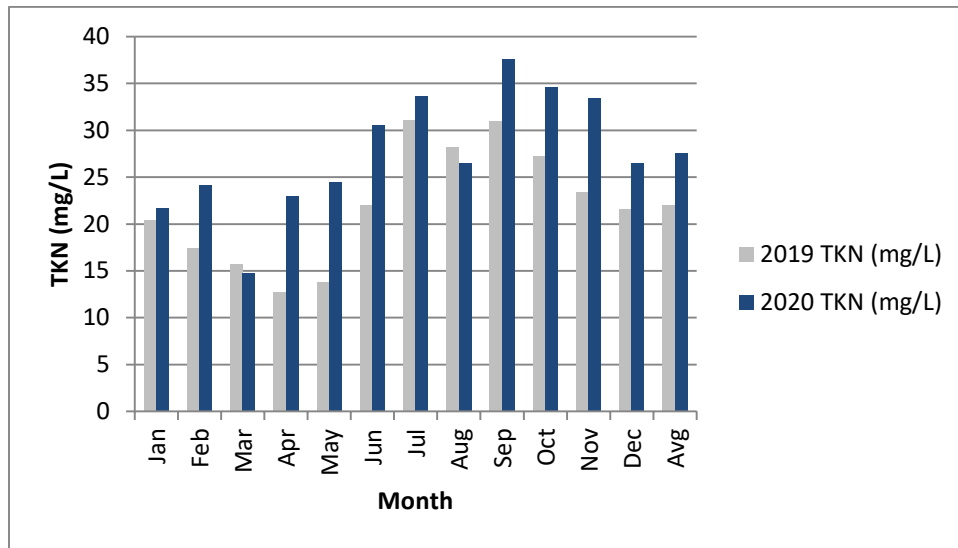
Graph 4.2: Final Effluent TSS



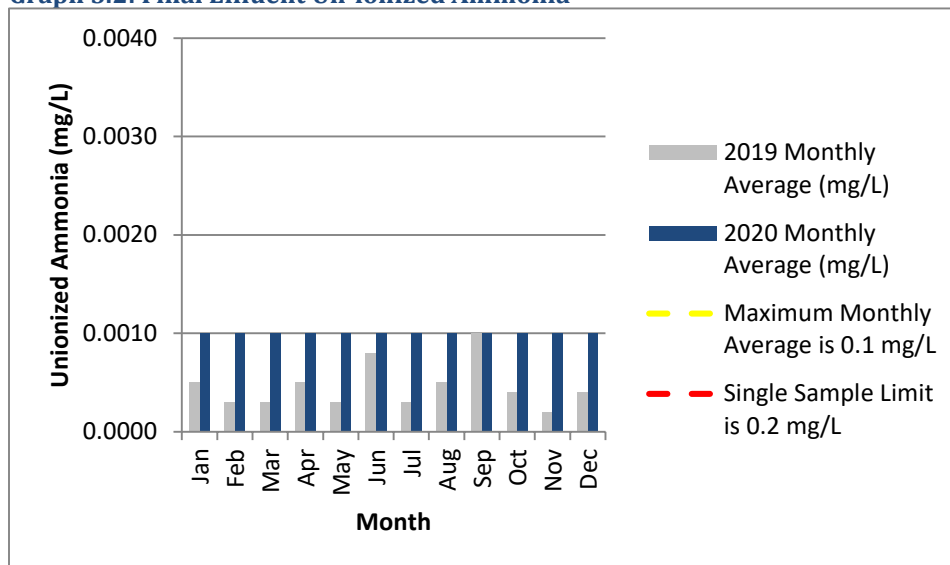
Total Kjeldahl Nitrogen(TKN) and Un-Ionized Ammonia

The annual average raw sewage Total Kjeldahl Nitrogen (TKN) concentration to the plant was 27.57 mg/L with a maximum concentration of 37.58 mg/L. The annual final effluent TAN (Total Ammonia Nitrogen) concentration was < 0.14 mg/L with a maximum concentration of < 0.32 mg/L. The average annual unionized ammonia concentration of the effluent was 0.001mg/L, with the compliance limit of 0.1 mg/L.

Graph 5.1: Raw Sewage Total Kjeddahl Nitrogen



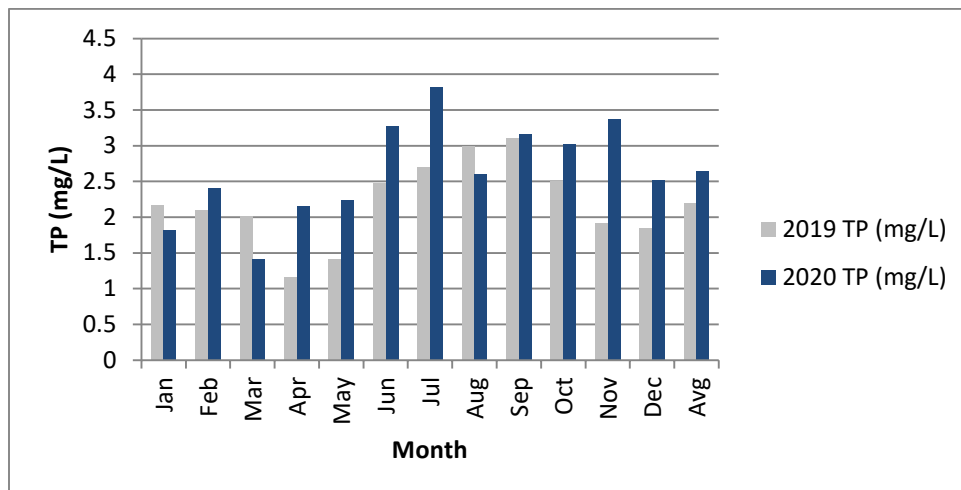
Graph 5.2: Final Effluent Un-ionized Ammonia



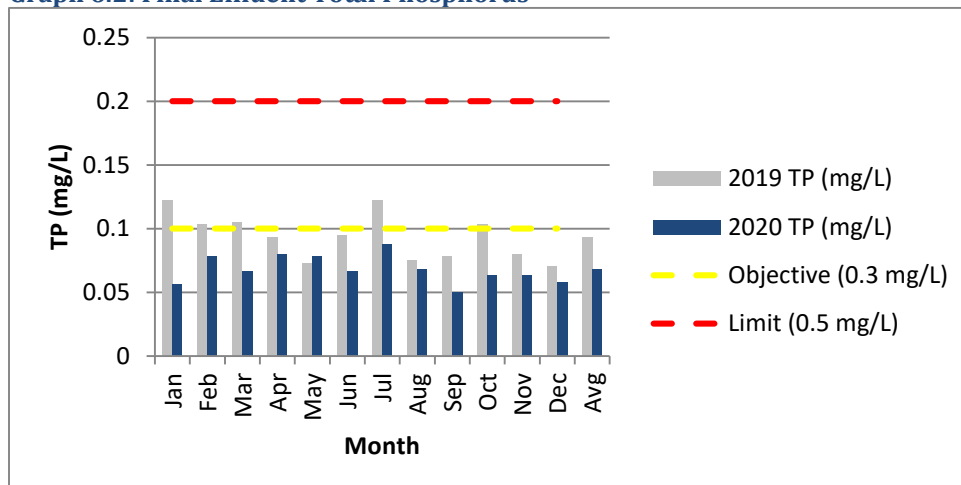
Total Phosphorous

The annual average raw sewage total phosphorus (TP) concentration to the plant was 2.65 mg/L with a maximum concentration of 3.83 mg/L. The annual average final effluent TP concentration was 0.068 mg/L with the maximum being 0.088 mg/L. Monthly Average TP values are shown in the graph below.

Graph 6.1: Raw Sewage Total Phosphorus



Graph 6.2: Final Effluent Total Phosphorus



Biosolids Quality

Biosolids produced at the Stratford WPCP are anaerobically-stabilized and land applied in accordance with the Ontario Guidelines for Sewage Biosolids Utilization on Agricultural Lands. All Biosolids sample analysis was carried out by SGS Lakefield Research Ltd. A summary of the analysis is provided in **Appendix 4**.

Bartels Environmental Services has been contracted to haul and land apply all Biosolids produced at the WPCP. A total of 16,267m³ was land applied to numerous sites located within Perth County. Monthly haulage volumes from the treatment plant can be found in the Annual Summary report in **Appendix 4**. Based on the information, the hauled biosolids volume for 2021 is anticipated to be in the range 17,000 m³.

Biosolids Land Application

NASM Plan Site ID	Month	Volumes (m ³)
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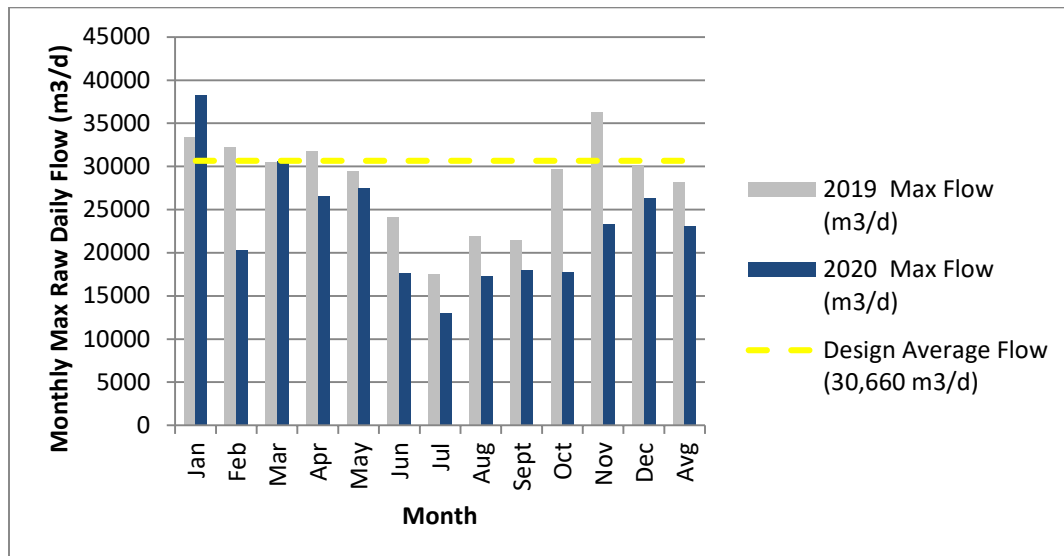
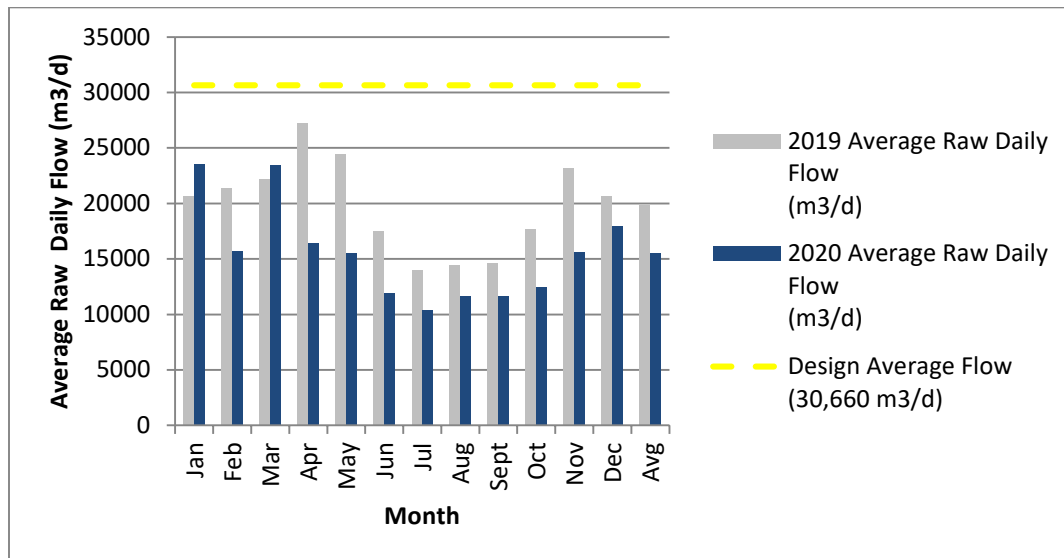
NASM Plan Site ID	Month	Volumes (m ³)
24193	April	2943
22854	April	3694
24404	August	4106
24408	October	2660
24413	November	2864
TOTAL		16,267

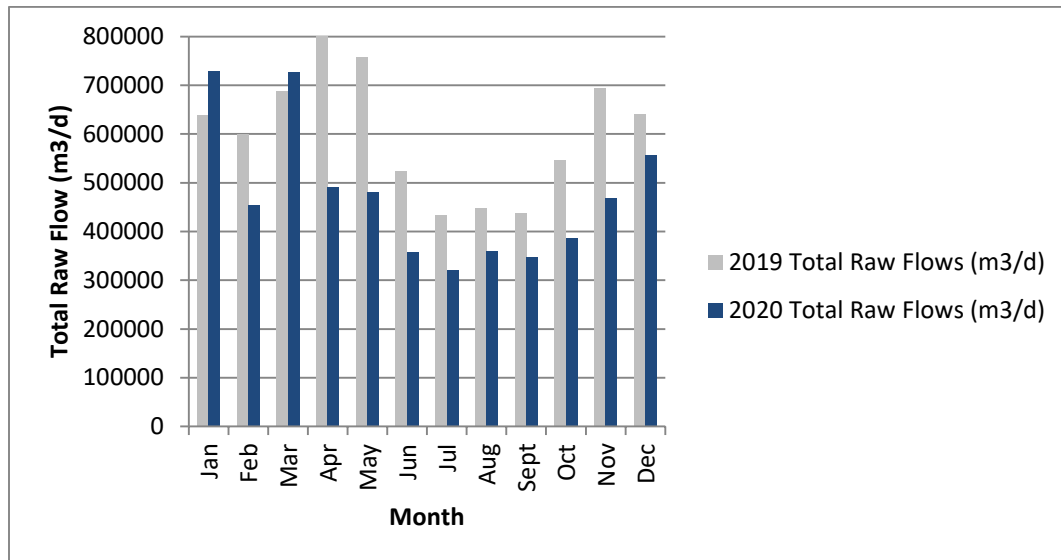
Air Quality

There were no odour complaints in 2020.

Appendix Cover Page

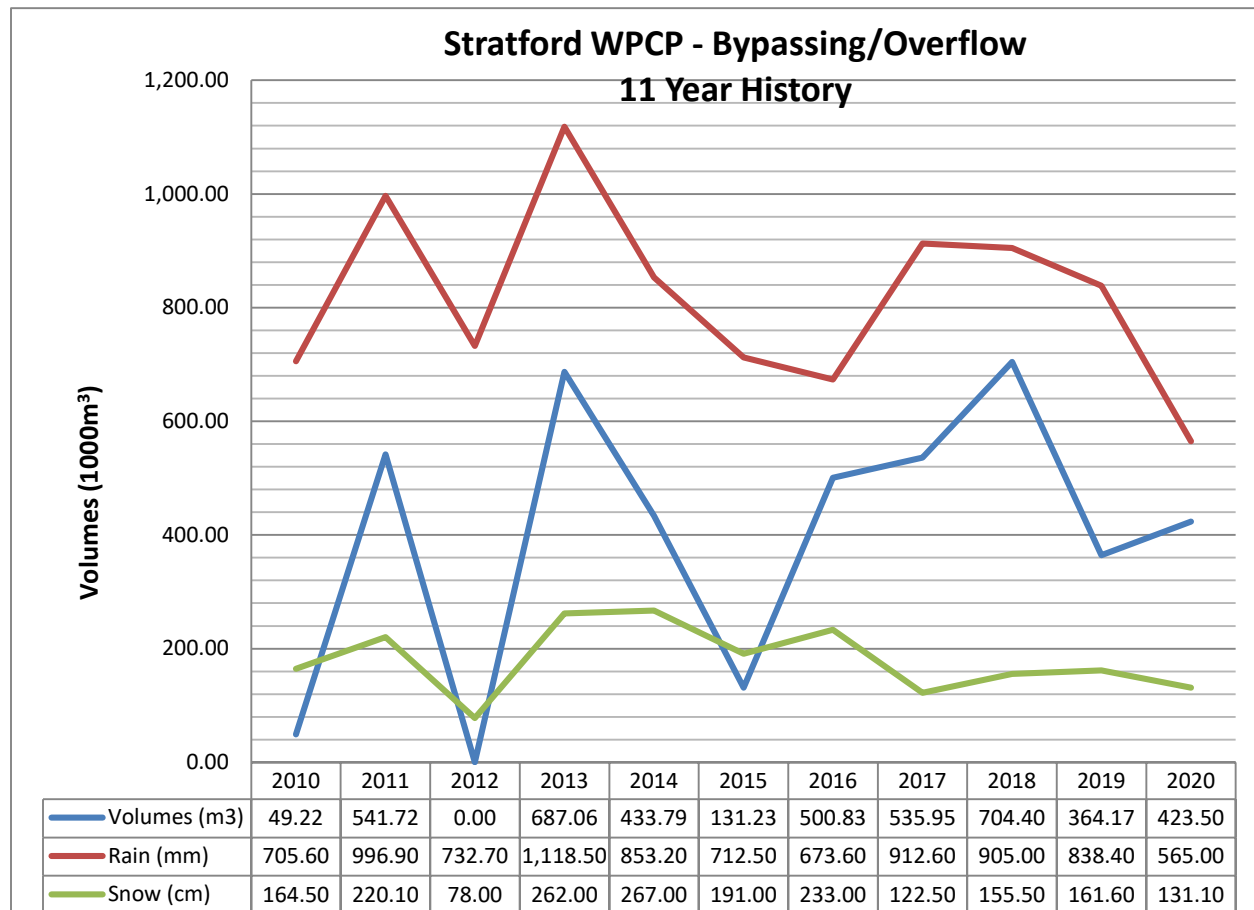
Appendix 1: Raw Sewage Influent Flows





Raw Water Influent Flows

Appendix 2: 11-Year Plant Bypass/Overflow History



Appendix 3: Plant Performance Data

Parameter	Annual Value	Loading Value
Total Flow:	5,681,718 m ³	n/a
Average Daily Flow:	15,507.24 m ³	n/a
Raw BOD :	137.9 mg/L	2,138 kg/day
Raw TSS:	147.9 mg/L	2,293 kg/day
Raw TKN:	27.6 mg/L	428 kg/day
Raw Total Phosphorus:	2.6 mg/L	40 kg/day
Effluent CBOD:	2.5 mg/L	33.6 kg/day
Effluent TSS:	4.1 mg/L	53.76 kg/day
Effluent Total Ammonia Nitrogen:	0.14 mg/L	2.076 kg/day
Total Phosphorus:	0.07 mg/L	0.93 kg/day
TSS % Removal:	98.5%	n/a
Total Phosphorus % Removal:	98.4%	n/a
Total Sludge Volume Removed:	16,267 m ³	n/a
Ferrous Chloride Used:	90,546 kg	n/a

Appendix 3: Performance Assessment Report Details

Note: The following raw data tables are not fully accessible, though can be made so by contacting the City

Performance Assessment Report

Facility: [5529] STRATFORD WASTEWATER TREATMENT FACILITY

Works: [110000702]

	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020	<--Total-->	<--Avg.-->	<--Max.-->	<--Criteria-->
Flows:																
Raw Flow: Total - Raw Sewage (m³)	729065.00	455498.00	726722.00	491999.00	480474.00	358012.00	321320.00	360130.00	348298.00	385290.00	468580.00	556330.00	5681718.00			
Raw Flow: Avg - Raw Sewage (m³/d)	23518.23	15706.83	23442.65	16399.97	15499.16	11933.73	10365.16	11617.1	11609.93	12428.71	15619.33	17946.13		15507.24		
Raw Flow: Max - Raw Sewage (m³/d)	38200	20250	30570	26583	27450	17570	13000	17300	17950	17750	23250	26350			38200.00	
Eff. Flow: Total - Final Effluent (m³)	675906.00	403057.00	675809.00	442165.00	419358.00	318318.00	276894.00	316390.00	300303.00	336225.00	421578.00	502363.00	5088366.00			
Eff. Flow: Avg - Final Effluent (m³/d)	21803.42	13898.52	21800.29	14738.83	13527.68	10610.60	8932.06	10206.13	10355.28	11207.50	14052.60	16205.26		13944.85		
Eff. Flow: Max - Final Effluent (m³/d)	37050.00	18481.00	28804.00	24802.00	25674.00	15951.00	11547.00	15684.00	16334.00	17226.00	21806.00	25845.00			37050.00	
Carbonaceous Biochemical Oxygen Demand: CBOD:																
Eff: Avg cBOD5 - Final Effluent (mg/L)	2	2	2	2.25	2	2.4	2	3	6	2.5	2	2.2	<	2.529	6.000	10.0
Eff: # of samples of cBOD5 - Final Effluent (mg/L)	5	4	5	4	4	5	4	4	5	4	4	5	53			
Loading: cBOD5 - Final Effluent (kg/d)	43.607	27.797	43.601	33.162	27.055	25.465	17.864	30.618	62.132	28.019	28.105	35.652	<	33.590	62.132	306.0
Biochemical Oxygen Demand: BOD5:																
Raw: Avg BOD5 - Raw Sewage (mg/L)	98.250	157.250	92.600	130.250	138.000	214.600	184.250	134.500	128.800	114.250	126.750	135.000		137.875	214.600	
Raw: # of samples of BOD5 - Raw Sewage (mg/L)	4	4	5	4	4	5	4	4	5	4	4	5	52			
Total Suspended Solids: TSS:																
Raw: Avg TSS - Raw Sewage (mg/L)	133.25	199	106.8	189.75	155.5	181.4	199.75	93.25	117.8	102.75	144	151.4		147.888	199.750	
Raw: # of samples of TSS - Raw Sewage (mg/L)	4	4	5	4	4	5	4	4	5	4	4	5	52			
Eff: Avg TSS - Final Effluent (mg/L)	2.6	3	3.2	3	3.5	5.4	4.5	9.5	3.4	3.75	3.25	4.2	<	4.108	9.500	10.0
Eff: # of samples of TSS - Final Effluent (mg/L)	5	4	5	4	4	5	4	4	5	4	4	5	53			
Loading: TSS - Final Effluent (kg/d)	56.689	41.696	69.761	44.217	47.347	57.297	40.194	96.958	35.208	42.028	45.671	68.062	<	53.761	96.958	306.0
Percent Removal: TSS - Raw Sewage (mg/L)	98.049	98.492	97.004	98.419	97.749	97.023	97.747	89.812	97.114	96.350	97.743	97.226			98.492	
Total Phosphorus: TP:																
Raw: Avg TP - Raw Sewage (mg/L)	1.823	2.403	1.416	2.148	2.243	3.27	3.825	2.595	3.158	3.025	3.365	2.51		2.648	3.825	
Raw: # of samples of TP - Raw Sewage (mg/L)	4	4	5	4	4	5	4	4	5	4	4	5	52			
Eff: Avg TP - Final Effluent (mg/L)	0.056	0.078	0.066	0.08	0.078	0.066	0.088	0.068	0.05	0.063	0.063	0.058	<	0.068	0.088	0.2 - 0.5
Eff: # of samples of TP - Final Effluent (mg/L)	5	4	5	4	4	5	4	4	5	4	4	5	53			
Loading: TP - Final Effluent (kg/d)	1.221	1.077	1.439	1.179	1.048	0.7	0.782	0.689	0.518	0.7	0.878	0.94	<	0.931	1.439	0.0
Percent Removal: TP - Raw Sewage (mg/L)	96.927	96.774	95.339	96.275	96.544	97.982	97.712	97.399	98.417	97.934	98.143	97.689			98.417	
Nitrogen Series:																
Raw: Avg TKN - Raw Sewage (mg/L)	21.65	24.175	14.78	22.975	24.425	30.5	33.675	26.5	37.58	34.65	33.4	26.48		27.566	37.580	
Raw: # of samples of TKN - Raw Sewage (mg/L)	4	4	5	4	4	5	4	4	5	4	4	5	52			
Eff: Avg TAN - Final Effluent (mg/L)	0.16	0.125	0.32	0.1	0.1	0.1	0.1	0.1	0.24	0.125	0.1	0.1	<	0.139	<	0.320
Eff: # of samples of TAN - Final Effluent (mg/L)	5	4	5	4	4	5	4	4	5	4	4	5	53			
Loading: TAN - Final Effluent (kg/d)	3.489	1.737	6.976	1.474	1.353	1.061	0.893	1.021	2.485	1.401	1.405	1.621	<	2.076	<	6.976
Eff: Avg NO3-N - Final Effluent (mg/L)	16.57	21.2	16.58	23.75	22.925	27.48	28.475	23.75	23.5	22.6	25.8	22.82		22.954	28.475	
Eff: # of samples of NO3-N - Final Effluent (mg/L)	5	4	5	4	4	5	4	4	5	4	4	5	53			
Eff: Avg NO2-N - Final Effluent (mg/L)	0.354	0.283	0.138	0.03	0.03	0.066	0.05	0.033	0.234	0.063	0.055	0.066	<	0.117	0.354	
Eff: # of samples of NO2-N - Final Effluent (mg/L)	5	4	5	4	4	5	4	4	5	4	4	5	53			
Disinfection:																
Eff: GMD E. Coli - Final Effluent (cfu/100mL)	5.826	4.472	5.448	7.141	6.620	1.741	2.000	2.000	1.516	2.991	2.000	2.491		3.687	7.141	200.0
Eff: # of samples of E. Coli - Final Effluent (cfu/100mL)	4	4	5	4	4	5	4	4	5	4	4	5	52			

DO, pH, Unionized Performance Assessment Report

	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020	Total	Avg	Max	Min
Final Effluent / Dissolved Oxygen: DO - mg/L																
Count IH	31	29	30	30	29	26	24	25	23	24	21	23	315			
Max IH	11.32	10.91	11.24	11.43	11	10.09	9.3	9.14	10.15	10.25	10.97	12.46			12.46	
Mean IH	10.404	10.141	10.231	10.705	10.36	9.232	8.667	8.53	9.097	8.831	10.177	10.972		9.821		
Min IH	8.5	8	8.83	9.93	9.44	8.32	7.69	7.06	7.12	7.61	9.57	9.97				7.06
Final Effluent / Un-ionized Ammonia: NH3 - mg/L																
Count IH	5	4	5	4	4	5	4	4	5	4	4	5	53			
Max IH	0.002	0.001	0.003	0.001	0.001	0	0.001	0	0.003	0.001	0	0.001			0.003	
Mean IH	0.001	0	0.001	0	0	0	0	0	0.001	0.001	0	0		0.001		
Min IH	0	0	0	0	0	0	0	0	0	0	0	0				0
Final Effluent / pH - ---																
Count IH	31	29	30	29	29	26	24	25	23	24	21	23	314			
Max IH	7.52	7.69	7.61	7.65	7.56	7.18	7.24	7.47	7.25	7.28	7.76	7.48			7.76	
Mean IH	7.252	7.134	7.239	7.159	7.117	6.823	6.925	6.926	6.952	7.057	7.147	7.189		7.084		
Min IH	6.92	6.71	6.98	6.9	6.66	6.39	6.61	6.6	6.68	6.86	6.84	7.01				6.39

Sludge Performance Assessment Report

	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020	Total	Avg	Max	Min
Stored Sludge / Arsenic: As Dry Wt - mg/kg																
Mean Lab	8	4	6	5	4	3	< 4	4	6	4	5	5	<	4.833		
Stored Sludge / Cadmium: Cd Dry Wt - mg/kg																
Mean Lab	0.9	0.6	0.8	0.7	1	0.8	0.5	0.8	0.9	0.5	0.6	0.6		0.725		
Stored Sludge / Chromium: Cr Dry Wt - mg/kg																
Mean Lab	250	160	190	180	160	130	87	130	150	130	140	140		153.917		
Stored Sludge / Cobalt: Co Dry Wt - mg/kg																
Mean Lab	18	11	14	15	11	10	7	10	11	14	13	12		12.167		
Stored Sludge / Copper: Cu Dry Wt - mg/kg																
Mean Lab	1100	730	890	890	820	800	590	910	1100	690	820	820		846.667		
Stored Sludge / E. Coli: EC - cfu/100mL																
Mean Lab	21000	80000	60000	6000	26000	66000	64000	30000	240000	15500000	290000	55000		1369833		
Stored Sludge / E. Coli: EC Dry Wt - cfu/g																
Mean Lab	5512	20942	15228	1523	7008	16625	22695	8499	79208	4599407	134884	18333		410822		
Stored Sludge / Hauled Vol. - m³																
Count IH	0	0	0	9	0	0	0	8	0	4	3	0	24			
Max IH				1144				843		900	1188				1188	
Mean IH				737.444				513.25		665	954.667			677.792		
Min IH				215				132		264	532					132
Total IH				6637				4106		2660	2864		16267			
Stored Sludge / Lead: Pb Dry Wt - mg/kg																
Mean Lab	30	19	23	23	21	19	43	93	99	51	45	38		42		
Stored Sludge / Mercury: Hg Dry Wt - mg/kg																
Mean Lab	0.6	0.29	0.51	0.46	0.3	0.3	0.21	0.88	0.79	0.33	0.37	0.3		0.445		
Stored Sludge / Molybdenum: Mo Dry Wt - mg/kg																
Mean Lab	30	17	23	24	18	16	16	28	38	24	31	28		24.417		
Stored Sludge / Nickel: Ni Dry Wt - mg/kg																
Mean Lab	180	120	140	140	92	73	67	140	200	160	190	170		139.333		
Stored Sludge / Phosphorus: P Dry Wt - mg/kg																
Mean Lab	46000	25000	29000	35000	28000	26000	19000	26000	30000	25000	28000	28000		28750		
Stored Sludge / Potassium: K Dry Wt - mg/kg																
Mean Lab	5300	2600	3100	3400	3000	2300	2200	1800	2500	2200	3200	2700		2858.333		
Stored Sludge / Selenium: Se Dry Wt - mg/kg																
Mean Lab	5	3	4	4	4	4	< 4	3	4	< 3	< 5	4	<	3.917		
Stored Sludge / Total Ammonia Nitrogen: NH3 + NH4 as N MGKG - mg/kg																
Mean Lab	25000	25000	28000	28000	30000		23000	16000	16000	2800	26000	21000		21890.91		
Stored Sludge / Total Kjeldahl Nitrogen: TKN MGKG - mg/kg																
Mean Lab	63000	59000	67000	64000	68000	59000	57000	48000	59000	46000	67000	61000		59833.33		
Stored Sludge / Volatile Acids - mg/L																
Mean Lab									84						84	
Stored Sludge / Zinc: Zn Dry Wt - mg/kg																
Mean Lab	4000	2200	2400	2300	1600	1200	1400	2700	3400	2300	2800	2700		2416.667		

Appendix 4: Glossary of Terms

Term	Acronym	Meaning in Relation to the Operational Compliance Report
Acute Lethality		Indicator of an effluent of a quality level such that it kills more than 50% of rainbow trout subjected to it for a period of a 96-hours
Biochemical Oxygen Demand	BOD ₅	Measure of the amount of oxygen needed by aerobic biological organisms in a body of water to break down organic material at a certain temperature over 5 days. Indicator of the level of organic materials present in water.
Bypass		Diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, within the Sewage Treatment Plant with the diverted sewage flows being returned to the Sewage Treatment Plant treatment train upstream of the Final Effluent sampling point(s) and discharged via the approved effluent disposal facilities
Bypass, Primary	PrBy	Diversion of sewage that has subjected to grit removal and disinfection (but not primary, secondary or tertiary treatment) before being released into the receiving waters
Bypass, Secondary	ScBy	Diversion of sewage that has been subjected to grit removal and primary treatment (settling and primary sludge removal) and disinfection (but not secondary or tertiary treatment) before being released into the receiving waters
Bypass, Tertiary	TeBy	Diversion of sewage that has been subjected to grit removal, primary treatment, secondary treatment (e.g. aeration) and typically nitrogen and phosphorous removal and disinfection (but not tertiary treatment) before being released into the receiving waters
Carbonaceous Biochemical Oxygen Demand	CBOD ₅	Measure of the amount of oxygen needed by aerobic biological organisms in a body of water to break down organic material at a certain temperature over 5 days. Nitrification inhibited during the 5 day testing of unfiltered sample. Indicator of the level of organic materials present in water.
Chlorine Residual		Concentration of chlorine remaining in the chlorinated water at the end of a given contact time that is available to continue to disinfect. Measured as Free Chlorine, Combined Chlorine and Total Chlorine.


Term	Acronym	Meaning in Relation to the Operational Compliance Report
Composite Sample		Quantity of undiluted effluent collected continually at an equal rate or at a rate proportionate to flow over a designated sampling period.
Contact Time	CT	The CT disinfection concept uses the combination of a disinfectant residual concentration (in mg/L) and the effective disinfectant contact time (in minutes), to quantify the capability of a chemical disinfection system to provide effective pathogen inactivation to the required level.
Contaminant		Any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities that causes or may cause an adverse effect.
Disinfection		Destruction or inactivation of pathogenic and other kinds of microorganisms by physical or chemical means.
Dissolved Oxygen	DO	Molecular (atmospheric) oxygen dissolved in water or wastewater.
Environmental Certificate of Approval	ECA	Legal instrument, issued by the MECP, which permits the construction or alteration and operation of wastewater systems, or parts thereof.
Escherichia coli	E.coli	Species of bacteria naturally present in the intestines of humans and animals. If animal or human waste containing E. coli contaminates drinking water it may cause gastrointestinal disease in humans. Most types of E. coli are harmless, but some active strains produce harmful toxins and can cause severe illness. The presence of even one colony forming unit (CFU) of EC in a microbiological sample is an AWQI.
Exceedance		Violation of a limit for a contaminant as prescribed by a regulation or legal instrument for a facility (e.g. Certificate of Approval).
Grab Sample		Quantity of undiluted sample collected at any given time.
Safety Data Sheet	SDS	Document that contains information on the potential hazards (health, fire, reactivity and environmental) and how to work safely with the chemical product.

Term	Acronym	Meaning in Relation to the Operational Compliance Report
Maximum Allowable Concentration	MAC	Concentration that represents the limit above which an exceedance occurs.
Micrograms Per Litre (µg/L)	µg/L	Measure of the amount of a compound in a solution in terms of micrograms of the compound per litre of solution. It is equivalent to a part per billion in water.
Milligrams Per Litre (mg/l)	mg/L	Measure of the amount of a compound in a solution in terms of milligrams of the compound per litre of solution; equivalent to a part per million in water.
Mixed Liquor Suspended Solids	MLSS	Suspended solid particles in the mixed liquor of an aeration tank.
Non-Agricultural Source Material	NASM	Materials from non-agricultural sources that can be applied to agricultural land to provide valuable nutrients to soil and crops.
Nitrate (NO ₃)/ Nitrite (NO ₂)		MAC for Nitrate (NO ₃) is 10 mg/L (as nitrogen). The MAC for Nitrite is 1 mg/L (as nitrogen). NO ₃ and NO ₂ combined have a MAC of 10 mg/L. Nitrate is commonly found in source water, especially ground water. Nitrite can be formed in water systems from either ammonia or nitrate.
Overflow		Means a discharge to the environment from the Works at designed location(s) other than the approved effluent disposal facilities or via the effluent disposal facilities downstream of the Final Effluent sampling point.
Pathogen		An organism capable of causing illness or death.
pH	pH	pH is a numerical measure of acidity, or hydrogen ion activity used to express acidity or alkalinity. Neutral value is pH 7.0, values below pH 7.0 are acid, and above pH 7.0 are alkaline.
Phosphorus	Phos	Phosphorus is an essential nutrient that contributes to plant productivity. In excessive amounts, this nutrient may contribute to a buildup of nutrients (called eutrophication), which can in turn encourage the overgrowth of weeds, algae, and cyanobacteria (blue-green algae).

Term	Acronym	Meaning in Relation to the Operational Compliance Report
Return Activated Sludge	RAS	Settled activated sludge collected in the secondary clarifier and returned to the aeration basin to mix with incoming raw or primary settled wastewater.
Sanitary Sewer Overflow	SSP	a discharge to the environment from a sanitary sewer system.
Sanitary Sewer System		a separate sewer system which conveys sanitary sewage (domestic, commercial and industrial wastewaters), infiltrated groundwater and limited amounts of stormwater where an adjoining separate storm sewer system exists as the primary collection system to receive stormwater flows from catch basins and other sources of stormwater.
Supervisory Control And Data Acquisition	SCADA	Automated system used by operations staff to monitor and control wastewater equipment and processes to ensure all plant parameters stay within target ranges.
Total Ammonia Nitrogen	TAN	Indicates the content of both un-ionized ammonia (NH ₃) and ionized ammonia (NH ₄ ⁺). NH ₃ is the principal form of toxic ammonia. Toxicity levels are both pH and temperature dependent.
Total Kjeldahl Nitrogen	TKN	Indicates nitrogen content in the form of organic proteins or their decomposition product ammonia, as measured by the Kjeldahl Method.
Total Suspended Solids	TSS	Particles larger than 2 microns found in water. Anything smaller than 2 microns (average filter size) is considered a dissolved solid. TSS in mg/L can be calculated as: (dry weight of residue and filter - dry weight of filter alone, in grams)/ mL of sample * 1,000,000.
Un-ionized Ammonia	NH ₃	Ammonia is un-ionized, and has the formula NH ₃ . Ammonium is ionized, and has the formula NH ₄ ⁺ . The major factor that determines the proportion of ammonia or ammonium in water is water pH. The activity of ammonia also is influenced by temperature and ionic strength. This is important as the unionized NH ₃ is the form that can be toxic to aquatic organisms. The ionized NH ₄ is basically harmless to aquatic organisms.

Term	Acronym	Meaning in Relation to the Operational Compliance Report
Waste Activated Sludge	WAS	The excess growth of microorganisms which must be removed from the process to keep the biological system in balance.
Wastewater System Effluent Regulation	WSER	Federal regulation established under the Fisheries Act that includes mandatory minimum effluent quality standards that can be achieved through secondary wastewater treatment. Requirements for monitoring, record-keeping, reporting and toxicity testing.
Work Management System (also known as Computerized Maintenance Management System)	WMS	<p>Software tool that allows staff to categorize work activities (Work Orders) into 4 types based on nature of work performed. These include corrective, preventive (e.g. weekly PM), capital, and operational. The work orders provide staff with all the information, instructions, and procedures that they need to complete the work.</p> <p>Contains a snapshot of the general overall condition, cost, criticality and life expectancy of equipment and plant assets. OCWA's uses the WMS to manage work, maintain equipment, and manage the assets within their care. Assets are registered within the WMS along with maintenance plans and schedules. As work orders containing this information are generated and closed, data is collected and used for reporting, and supporting modification of the preventive maintenance program.</p>

Appendix 5: 2021 Sampling Calendar

	Sample Schedule 2021 Stratford WPCP		Issued: 2020-12-08 Rev.#: 0 Pages: 1 of 12
	Reviewed by: QEMS Representative	Approved by: Operations Management	

January 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 STAT	2
3	4 IH Full Monthly Sludge, Raw & Effluent Acute Lethality	5	6	7 IH Full	8	9
10	11 IH Full Weekly Raw & Effluent Samples	12	13	14 IH Full	15	16
17	18 IH Full Weekly Raw & Effluent Samples	19	20	21 IH Full	22	23
24	25 IH Full Weekly Raw & Effluent Samples	26	27	28 IH Full	29	30
31						

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS,N, HG,AS,CD, CO, CR, CU, K, MO, NI, TP, PB,SE, ZN, TKN, TAN, E.coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS,TP, Alk.,TKN, TAN, NO₂+NO₃, Uni.)

Grab (E. coli)


Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.

Revision History

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette

	<h2>Sample Schedule 2021 Stratford WPCP</h2>		Issued: 2020-12-08 Rev.#: 0 Pages: 2 of 12
	Reviewed by: QEMS Representative	Approved by: Operations Management	

February 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 IH Full Monthly Sludge, Raw & Effluent	2	3	4 IH Full	5	6
7	8 IH Full Weekly Raw & Effluent Samples	9	10	11 IH Full	12	13
14	15 STAT	16 IH Full Weekly Raw & Effluent Samples	17	18 IH Full	19	20
21	22 IH Full Weekly Raw & Effluent Samples	23	24	25 IH Full	26	27
28						

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS, N, HG, AS, CD, CO, CR, CU, K, MO, NI, TP, PB, SE, ZN, TKN, TAN, E. coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS, TP, Alk., TKN, TAN, NO₂+NO₃, Uni.)

Grab (E. coli)


Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.

Revision History

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette

 Ontario Clean Water Agency	Sample Schedule 2021 Stratford WPCP	Issued: 2020-12-08 Rev.#: 0 Pages: 3 of 12
Reviewed by: QEMS Representative		Approved by: Operations Management

March 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 IH Full Monthly Sludge, Raw & Effluent	2	3	4 IH Full	5	6
7	8 IH Full Weekly Raw & Effluent Samples	9	10	11 IH Full	12	13
14	15 IH Full Weekly Raw & Effluent Samples	16	17	18 IH Full	19	20
21	22 IH Full Weekly Raw & Effluent Samples	23	24	25 IH Full	26	27
28	29 IH Full Weekly Raw & Effluent Samples	30	31			

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS,N, HG,AS,CD, CO, CR, CU, K, MO, NI, TP, PB,SE, ZN, TKN, TAN, E.coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS,TP, Alk.,TKN, TAN, NO₂+NO₃, Uni.)

Grab (E. coli)


Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.

Revision History

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette

	Sample Schedule 2021 Stratford WPCP		Issued: 2020-12-08 Rev.#: 0 Pages: 4 of 12
	Reviewed by: QEMS Representative	Approved by: Operations Management	

April 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 IH Full	2 STAT	3
4	5 STAT	6 IH Full Monthly Sludge, Raw & Effluent	7	8 IH Full	9	10
11	12 IH Full Weekly Raw & Effluent Samples	13	14	15 IH Full	16	17
18	19 IH Full Weekly Raw & Effluent Samples	20	21	22 IH Full	23	24
25	26 IH Full Weekly Raw & Effluent Samples	27	28	29 IH Full	30	

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS, N, HG, AS, CD, CO, CR, CU, K, MO, NI, TP, PB, SE, ZN, TKN, TAN, E. coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS, TP, Alk., TKN, TAN, NO₂+NO₃, Uni.)


Grab (E. coli)

Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.**Revision History**

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette

	<h2>Sample Schedule 2021 Stratford WPCP</h2>		Issued: 2020-12-08 Rev.#: 0 Pages: 5 of 12
	Reviewed by: QEMS Representative	Approved by: Operations Management	

May 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1
2	3 IH Full Monthly Sludge, Raw & Effluent	4	5	6 IH Full	7	8
9	10 IH Full Weekly Raw & Effluent Samples	11	12	13 IH Full	14	15
16	17 IH Full Weekly Raw & Effluent Samples	18	19	20 IH Full	21	22
23	24 STAT	25 IH Full Weekly Raw & Effluent Samples	26	27 IH Full	28	29
30	31 IH Full Weekly Raw & Effluent Samples					

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS, N, HG, AS, CD, CO, CR, CU, K, MO, NI, TP, PB, SE, ZN, TKN, TAN, E. coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS, TP, Alk., TKN, TAN, NO₂+NO₃, Uni.)


Grab (E. coli)

Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.**Revision History**

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette

	Sample Schedule 2021 Stratford WPCP		Issued: 2020-12-08 Rev.#: 0 Pages: 6 of 12
	Reviewed by: QEMS Representative	Approved by: Operations Management	

June 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3 IH Full	4	5
6	7 IH Full Monthly Sludge, Raw & Effluent	8	9	10 IH Full	11	12
13	14 IH Full Weekly Raw & Effluent Samples	15	16	17 IH Full	18	19
20	21 IH Full Weekly Raw & Effluent Samples	22	23	24 IH Full	25	26
27	28 IH Full Weekly Raw & Effluent Samples	29	30			

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS, N, HG, AS, CD, CO, CR, CU, K, MO, NI, TP, PB, SE, ZN, TKN, TAN, E. coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS, TP, Alk., TKN, TAN, NO₂+NO₃, Uni.)

Grab (E. coli)


Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.

Revision History

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette

	<h2 style="text-align: center;">Sample Schedule 2021 Stratford WPCP</h2>		Issued: 2020-12-08 Rev.#: 0 Pages: 7 of 12
			Reviewed by: QEMS Representative

July 2021						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 STAT	2 IH Full	3
4	5 IH Full Monthly Sludge, Raw & Effluent	6	7	8 IH Full	9	10
11	12 IH Full Weekly Raw & Effluent Samples	13	14	15 IH Full	16	17
18	19 IH Full Weekly Raw & Effluent Samples	20	21	22 IH Full	23	24
25	26 IH Full Weekly Raw & Effluent Samples	27	28	29 IH Full	30	31

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS,N, HG,AS,CD, CO, CR, CU, K, MO, NI, TP, PB,SE, ZN, TKN, TAN, E.coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS,TP, Alk.,TKN, TAN, NO₂+NO₃, Uni.)

Grab (E. coli)

Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.**Revision History**

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette



Sample Schedule 2021 Stratford WPCP

Issued: 2020-12-08
Rev.#: 0
Pages: 8 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

August 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2 STAT	3 IH Full Monthly Sludge, Raw & Effluent	4	5	6 IH Full	7
8	9 IH Full Weekly Raw & Effluent Samples	10	11	12	13 IH Full	14
15	16 IH Full Weekly Raw & Effluent Samples	17	18	19	20 IH Full	21
22	23 IH Full Weekly Raw & Effluent Samples	24	25	26	27 IH Full	28
29	30 IH Full Weekly Raw & Effluent Samples	31				

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS, N, HG, AS, CD, CO, CR, CU, K, MO, NI, TP, PB, SE, ZN, TKN, TAN, E. coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS, TP, Alk., TKN, TAN, NO₂+NO₃, Uni.)

Grab (E. coli)


Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.

Revision History

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette

	Sample Schedule 2021 Stratford WPCP		Issued: 2020-12-08 Rev.#: 0 Pages: 9 of 12
	Reviewed by: QEMS Representative	Approved by: Operations Management	

September 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2 IH Full	3	4
5	6 STAT	7 IH Full Monthly Sludge, Raw & Effluent	8	9 IH Full	10	11
12	13 IH Full Weekly Raw & Effluent Samples	14	15	16 IH Full	17	18
19	20 IH Full Weekly Raw & Effluent Samples	21	22	23 IH Full	24	25
26	27 IH Full Weekly Raw & Effluent Samples	28	29	30 IH Full		

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS, N, HG, AS, CD, CO, CR, CU, K, MO, NI, TP, PB, SE, ZN, TKN, TAN, E. coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS, TP, Alk., TKN, TAN, NO₂+NO₃, Uni.)


Grab (E. coli)

Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.**Revision History**

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette

 QEMS Ontario Clean Water Agency	Sample Schedule 2021 Stratford WPCP		Issued: 2020-12-08 Rev.#: 0 Pages: 10 of 12
	Reviewed by: QEMS Representative	Approved by: Operations Management	

October 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3	4 IH Full Monthly Sludge, Raw & Effluent	5	6	7 IH Full	8	9
10	11 STAT	12 IH Full Weekly Raw & Effluent	13	14 IH Full	15	16
17	18 IH Full Weekly Raw & Effluent Samples	19	20	21 IH Full	22	23
24	25 IH Full Weekly Raw & Effluent Samples	26	27	28 IH Full	29	30
31						

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS,N, HG,AS,CD, CO, CR, CU, K, MO, NI, TP, PB,SE, ZN, TKN, TAN, E.coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS,TP, Alk.,TKN, TAN, NO₂+NO₃, Uni.)

Grab (E. coli)

Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.

Revision History

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette



Sample Schedule 2021 Stratford WPCP

Issued: 2020-12-08
Rev.#: 0
Pages: 11 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

November 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 IH Full Monthly Sludge, Raw & Effluent	2	3	4 IH Full	5	6
7	8 IH Full Weekly Raw & Effluent Samples	9	10	11 STAT	12 IH Full	13
14	15 IH Full Weekly Raw & Effluent Samples	16	17	18 IH Full	19	20
21	22 IH Full Weekly Raw & Effluent Samples	23	24	25 IH Full	26	27
28	29 IH Full Weekly Raw & Effluent Samples	30				

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS, N, HG, AS, CD, CO, CR, CU, K, MO, NI, TP, PB, SE, ZN, TKN, TAN, E. coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS, TP, Alk., TKN, TAN, NO₂+NO₃, Uni.)

Grab (E. coli)

Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.

Revision History

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette



Sample Schedule 2021 Stratford WPCP

Issued: 2020-12-08
Rev.#: 0
Pages: 12 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

December 2021

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2 IH Full	3	4
5	6 IH Full Monthly Sludge, Raw & Effluent	7	8	9 IH Full	10	11
12	13 IH Full Weekly Raw & Effluent Samples	14	15	16 IH Full	17	18
19	20 IH Full Weekly Raw & Effluent Samples	21	22	23 IH Full	24	25
26	27 STAT	28 STAT	29 IH Full Weekly Raw & Effluent Samples	30	31 IH Full	

IH (In House) Full:

Raw (Temp., pH, DO)

Aeration (Set Test, MLSS, DO, pH, Temp.) RAS (SS)

Effluent Composite (TP, NH₃+NH₄, SS); Grab (DO, pH, Temp.)

Monthly Sludge Sample:

Grab Stored Sludge (TSS, N, HG, AS, CD, CO, CR, CU, K, MO, NI, TP, PB, SE, ZN, TKN, TAN, E. coli)

Grab Primary Sludge (Volatile Acid)

Monthly Samples:

Composite Monthly Raw (BOD₅, TSS, TP, Alk., TKN)

Weekly Samples:

Composite Weekly Raw (BOD₅, TSS, TP, TKN)

Effluent Samples:

Composite (cBOD₅, SS, TP, Alk., TKN, TAN, NO₂+NO₃, Uni.)

Grab (E. coli)

Annual Effluent:

Acute lethality for Rainbow Trout

Notes: Initial on date when sample was taken. Add any additional sampling completed for the facility. At the end of the month hand in to the PCT.

Revision History

Date	Revision #	Reason for Revision	Revision By
2020-12-08	0	Create Schedule	Stephanie Baronette



MANAGEMENT REPORT

Date: April 28, 2021
To: Infrastructure, Transportation and Safety Sub-committee
From: Allison Jordan, Events Coordinator
Report#: ITS21-010
Attachments: 2021 The HUB Stratford - Letter of Request; 2021 The HUB Stratford - Letter to Residents

Title: Request for Exemption from Noise Control By-law 113-79 for The HUB Stratford's five-year anniversary

Objective: To consider the request from The HUB Stratford for an exemption from Noise Control By-law 113-79 for their five-year anniversary on Thursday, July 1, 2021

Background: The City has been approached by Management of The HUB Stratford for an exemption from the City's Noise Control By-law 113-79 for their five-year anniversary event. The celebration will include live music on the roof-top patio of The HUB Stratford at 31 Market Place Road on Thursday, July 1, 2021 from 2:00 p.m. to 10:00 p.m.

The production, reproduction or amplification of sound is one of the sounds regulated by Noise Control By-law 113-79 as follows:

No person shall make, cause or permit an unreasonable noise or a noise that is likely to disturb inhabitants of the City [Schedule 1 clause 8].

The operation of any electronic device or group of connected electronic devices incorporating one or more loudspeakers or other electro-mechanical transducers, and intended for the production, reproduction or amplification of sound [Schedule 2 clause 2]. Prohibited Zones and Times:

Quiet Zone – Prohibited at all times;

Residential Zone – Prohibited all day Sundays and Statutory Holidays, and from 17:00 hours of one day to 07:00 hours next day.

Commercial Zone - Prohibited all day Sundays and Statutory Holidays, and 23:00 hours of one day to 7:00 hours next day Monday to Thursday, and 24:00 hours of one day to 7:00 hours next day Friday and Saturday.

Park Zone – Prohibited from 11:00 p.m. of one day to 7:00 a.m. next day; 9:00 a.m. on Sundays.

Yelling, shouting, hooting, whistling or singing [Schedule 2 clause 16]. Prohibited Zones and Times:

Quiet Zone – Prohibited at all times;

Residential Zone – Prohibited from 23:00 hours of one day to 07:00 hours next day, 09:00 hours Sundays

Commercial Zone – Prohibited from 23:00 hours of one day to 07:00 hours next day, 09:00 hours Sundays

Park Zone – Prohibited from 23:00 hours of one day to 07:00 hours next day, 09:00 hours Sundays

The operation or use of musical instruments or noise making equipment. [Schedule 2 clause 17]. Prohibited Zones and Times:

Quiet Zone – Prohibited at all times;

Residential Zone – Prohibited all day Sundays and Statutory Holidays, and from 19:00 hours of one day to 07:00 hours next day.

Commercial Zone – Prohibited from 01:00 hours to 07:00 hours the same day.

Park Zone – No prohibited times listed.

Noise By-laws are designed to reduce and control both unnecessary and excessive sound which can be a nuisance and generally degrade the quality and peacefulness of neighbourhoods.

Organizers mailed notices to property owners within 120-metres of the event location on March 30, 2021 with a deadline for comments of April 12, 2021. As of the April 12 deadline, no concerns were received for the requested noise exemption.

A notice of the request was also issued in the Town Crier with a deadline for comments of April 12, 2021. As of the April 12 deadline, the City has not received any concerns.

Analysis: The City's Noise Control By-law defines parameters for noise and emissions that may impact local citizens. Any exemption requests to these time limitations are subject to Council review and final decision. This is a first-time event request of this nature for a public event on a statutory holiday held at this location. The HUB Stratford was granted an exemption previously for a private event held at their property at 33 Market Place on Saturday, September 15, 2019 and the City is not aware of noise concerns made to the City for this previous event.

The permissibility of and operational requirements for the five-year anniversary event are contingent on Provincial Emergency Orders in effect at the time, including gathering limits. Event organizers are responsible for adhering to applicable public health guidelines and provincial regulations.

The organizers have sought public input by mailing notices to residents within 120-metres of the event location. The location is within a designated commercial zone and the 120-metre radius extends into residential zones. No submissions were received.

The intention of the noise exemption is to permit the following:

- Noise produced by live performers for the duration of the event from 2:00 p.m. to 10:00 p.m. on Thursday, July 1, 2021. Unreasonable noise is prohibited per the unreasonable noise provision [Schedule 1 clause 8].
- The operation of loudspeakers and amplification of sound from 2:00 p.m. to 10:00 p.m. on Thursday, July 1, 2021. The requested hours are prohibited all day on Statutory Holidays under Schedule 2 Clause 2 for residential zones and commercial zones.
- The operation of musical instruments from 2:00 p.m. to 10:00 p.m. on Thursday, July 1, 2021. The requested hours are prohibited on Statutory Holidays under Schedule 2 Clause 17 for residential zones.

The singing by live performers from 2:00 p.m. to 10:00 p.m. on Thursday, July 1, 2021 is permitted under Schedule 2 Clause 16 for residential zones and commercial zones, and an exemption is not required for this provision.

Financial Impact: None identified.

Alignment with Strategic Priorities:

Strengthening our Plans, Strategies and Partnerships

Partnering with the community to make plans for our collective priorities in arts, culture, heritage and more. Communicating clearly with the public around our plans and activities.

Staff Recommendation: THAT approval be given to the request from The HUB Stratford for an exemption to the Noise Control By-law 113-79 for their five-year anniversary event held at 31 Market Place on Thursday, July 1, 2021 from 2:00 p.m. to 10:00 p.m. from the following provisions:

- **Unreasonable noise [Schedule 1 clause 8]**
- **The operation of loudspeakers and amplification of sound [Schedule 2 Clause 2]**
- **The operation or use of musical instruments [Schedule 2 Clause 17],**
and,

subject to applicable Provincial Orders and Public Health Guidelines in place at that time.



Allison Jordan, Events Coordinator

A handwritten signature in blue ink, appearing to read "D St. Louis".

David St. Louis, Director of Community Services

A handwritten signature in blue ink, appearing to read "Joan Thomson".

Joan Thomson, Chief Administrative Officer

March 29th, 2021

To Whom it may concern:

The HUB Stratford is requesting a noise by-law exception for Thursday, July 1st 2021. July 1st is The HUB's five year anniversary. We are planning live music on our roof-top patio to celebrate. With it being a Holiday The HUB is requesting an noise exemption from 2PM to 10PM to allow our patrons to enjoy live music. The music will also be able to be heard and enjoyed to patrons using Market Square.

Thank You

Julia Allum

519.301.2430

media@thehubfamily.com

March, 31st, 2021

To Whom it may concern:

The Hub has requested a noise exemption on Thursday, July 1st from 2pm to 10pm as The HUB celebrates 5 years in business and is planning to have live music on our patio. The live music event will take place at The Hub Stratford located at 31 Market Place. If you have any concerns or comments please feel free to reach out to our Media and Marketing Manager, Julia Allum.

media@thehubfamily.com or 519.301.2430

All comments must be received by Monday, April 12th, 2021

Thank You

Julia Allum

Capital Projects, Engineering, and Operations Update April 2021

1. Queen Street Storm Sewer
 - ECA received, Open house in April, tender later in the spring
2. Flow Monitoring and Sanitary model update
 - Final report received
3. Storm Model and Master Plan Update
 - RFP for consultant services being prepared
 - Update to existing storm model and consolidation of all existing storm master plans and EA reports
4. St. Vincent Watermain Phase 2 – Patricia to Redford
 - Construction complete, line painting outstanding
5. Bridge Improvements
 - McLean Taylor awarded contracts
 - Railway trestle bridge and Footbridge installation complete
6. Redford Crescent Reconstruction
 - New watermain, sanitary sewer, some storm sewer, new street lighting
 - Tender awarded to Bre-Ex Construction Inc., construction complete for 2020
 - Street lighting and Wightman installation complete
 - Final restoration ongoing, topcoat later in the spring
7. Asphalt Resurfacing 2020
 - O’Loane Avenue from north of Galt Road to Line 36 (Quinlan Road)
 - Includes new ditching and driveway culverts for improved drainage
 - Tender awarded to Steve Smith Construction, 2020 work complete
 - Final works, topcoat asphalt and restoration scheduled for 2021
8. Asphalt Resurfacing 2021
 - Romeo Street North from Arden Park to the Court Drain, and Romeo Street South from Norfolk Street to Lorne Avenue
 - open house online, tender scheduled for May
9. Huron Street Reconstruction, Phase 1
 - Connecting Link funded project
 - Design and Contract Admin awarded to IBI Group
 - New watermain, sanitary sewer, storm sewer, roadway
 - Traffic study complete, design ongoing, open house scheduled for June, construction in 2022
10. Sidewalk projects 2021
 - West Gore from St. Vincent to John, Mornington from McCarthy to Graff
 - design ongoing, tender scheduled for May

11. Argyle Street and McKenzie Street Reconstruction 2021
 - Full reconstruction with new watermain, sanitary and storm sewers
 - Tender closed and is under review by staff
12. T J Dolan Multi-use Trail
 - Phase 1 design complete (St. Vincent to St. David)
 - Phase 2 Public meeting on March 15 (St. David to Centre)
 - Waiting for funding announcement
13. Concrete and Asphalt Restoration
 - Steve Smith Construction contract extended for 2021
 - Monthly work lists being assigned, work has commenced

Other Engineering Department Works

- Review of development engineering plans and reports for Thames West (on O'Loane north of the railway), Knightsbridge Subdivision (Quinlan and Mornington), Stratford Fairgrounds, Coventry of Stratford Phase 5 (Orr Street east and west of Bradshaw Drive), Daly Avenue subdivision
- Coventry Phase 4, Countryside Phase 3 approved for full building permits
- Review of formal Consultations, Site plan applications, zone change applications, and various other planning matters
- Installation of Wightman infrastructure continuing, neighbourhood running lines being evaluated and approved
- Inspection services for subdivision construction ongoing
- Compiling data for asset management project
- Sidewalk inspections will commence in May. Inspections will be completed by Top Hat Robotics. Information will be posted online in May.

Operations Update

Water:

- Spring hydrant flushing will begin on April 26th. This has been communicated on social media in advance and daily updates will be sent to Mike Beitz to for updates of specific impacted areas.
- Our 2021 Valve Preventative Maintenance Program is underway. The goal is to exercise and update the data for all system valves by the end of 2021
- We are starting to prep for a number of HAS's for water and sewer this spring. Some will involve impacting arterial streets such as Ontario St. All road restrictions will be communicated ahead of time
- We have started some building updates to the Romeo Control Centre (New A/C units for new VFD room)
- Ongoing upgrades for system wide SCADA

Wastewater:

- Started the process to have a new permanent generator installed at Dunn Rd. Sanitary Pumping Station. Awaiting consent from counsel
- Badger Daylighting Services has been retained to work this week on the O'Loane trunk sanitary sewer to deal with severe grease issue
- Badger Daylighting has just completed 4km of sanitary inspection and cleaning on identified vulnerable sanitary sewers. The data is currently under review

WPCP

- The 2020 annual report has been completed by OCWA and submitted to ITS Sub-committee for review and consideration

Public Works

Public Works has shifted the majority of operations to spring/summer clean up and prep.

- One full round of sweeping will be completed in the next two weeks.
- Sign work and replacements from winter damages are being completed.
- Discussions on Cell 3B expansion with Blu Metric Environmental are underway. Drawings and Ministry involvement are expected to be completed this year with project completion taking place at the start of 2022.
- Pothole repair continues until the asphalt plant is operational for hot asphalt applications.
- Sod damages are being restored by City staff. Soil is being added where needed, and removed if necessary. Seeding will take place once weather conditions allow.
- Storm flushing operations continue with staff focusing on a quarter of the City at a time. The goal is to have the storm system flushed every 4 years.
- Catch basin cleaning quotations are out and awaiting costs. Project will be completed mid to late May.
- The majority of the fleet has been switched over for summer operations, however, several pieces are still equipped with blades and salters if conditions call for snow/ice removal.



A meeting of the Stratford Accessibility Advisory Committee (AAC) was held on Tuesday, March 2, 2021 at 11:30 a.m., electronically.

Committee Present: Peter Zein – Chair Presiding, Councillor Bonnie Henderson, Diane Sims, Susan Lavender, Judy Hopf, Geoff Krauter

Staff Present: Tatiana Dafoe – Clerk (City of Stratford), Ed Dujlovic – Director of Infrastructure and Development Services (City of Stratford), Jonathan DeWeerd – Chief Building Official (City of Stratford), Alyssa Bridge – Manager of Planning (City of Stratford), Tyler Sager – Manager of Legislative Services/Clerk (County of Perth), Sean McCoy – Legislative Coordinator (County of Perth), Casey Riehl – Recording Secretary (City of Stratford)

Absent: Peg Huettlin, Laurie Maloney-Devlin

Minutes

1.0 Call to Order

The Chair called the AAC meeting to order at 11:31 a.m.

2.0 Disclosure of Pecuniary Interest and the General Nature Thereof

None declared.

3.0 Adoption of the Previous Minutes

Motion by Judy Hopf, seconded by Diane Sims

THAT the minutes from the Accessibility Advisory Committee meeting dated February 2, 2021 be adopted as printed.

Carried

4.0 Overview of the AAC Terms of Reference, Roles and Responsibilities

Tyler Sager introduced Sean McCoy, Legislative Coordinator for the County of Perth. Mr. McCoy will be taking on some of the responsibilities associated with the AAC. Tyler Sager reviewed the accessibility laws and regulations that relate to the committee.

Mr. Sager explained the role of the AAC is to provide advice to the municipal government on a wide range of municipal processes to help make public services and facilities accessible to everyone. The AAC has three main responsibilities:

1. to advise municipal council,
2. to review site plans and drawings described in Section 41 of the Planning Act, and
3. to perform all other functions that are specified in the regulations.

Tatiana Dafoe reviewed the Committee's Terms of Reference, specifically their purpose and the roles of members. The Committee's role in action was outlined, along with ways their goals and initiatives can be achieved.

5.0 Facility Accessibility Design Manual and the Building Code Act

Jonathan DeWeerd reviewed what the Facility Accessibility Design Manual is. The FADS Design Manual addresses accessibility requirements for the design and construction of new facilities, as well as the retrofit, alteration, or additions to existing facilities, owned, leased or operated by the City of Stratford. The City of Stratford's Facility Accessibility Design Manual will replace the City of Stratford Guidelines that were adopted by City Council in August, 2004. He reviewed the barrier free policy and five main goals, how the Ontario Building Code fits in and when barrier free design is not a requirement. Mr. DeWeerd highlighted some of the Appendices in the Manual, including the FADM checklist, design requirements, design review process, who reviews and signs off on the checklists and FADM compliance.

Tatiana Dafoe suggested once the FADS Design Manual is passed by Council, the AAC could champion the document. The AAC could provide a presentation to the Stratford & Area Builders Association (SABA) on what the manual is, why the AAC believes there is a benefit in developers implementing the standards and guidelines contained within. If SABA can champion the document to their members and developers, there may be greater success in the guidelines being utilized.

Peter Zein stated that education will be key to informing builders and developers on a process to use the FADM guidelines and the Ontario Building Code standards to make the best possible accessibility design decisions. Jonathan DeWeerd stated that it will be the role of the Accessibility Coordinator to be the liaison communicating with the developers/builders, staff and the AAC.

Diane Sims inquired what the process is for the checklists to reach AAC members for review and feedback. Jonathan DeWeerd and Tyler Sager explained that all site plan checklists are given to the AAC for feedback, however only the building review checklists are sent if there are any notable issues or items not in compliance. The concern is time sensitive items and creating delays with the review process. Tatiana Dafoe advised staff would report back on a detailed process for the Committee to review applications not in compliance with the manual.

Peter Zein inquired if staff could provide an overview of the changes made to the FADM. Jonathan DeWeerd stated that staff could put together a breakdown of the recent changes and updates.

Geoff Krauter inquired if the FADM guidelines would apply to land that is zoned for a development, however it is still held by the City. For example, would the guidelines apply to current city-owned land that has not yet been sold for development. Jonathan DeWeerd stated that in that case, the site plan portion would be looked at by the AAC, however the building is not required to comply.

The Committee discussed holding a future forum, in partnership with SABA, to provide accessibility information to contractors who are building developments and private homes in Stratford. Mr. Zein stated the FADM is a valuable educational tool that should be provided to as many developers of public and private buildings as possible.

Councillor Henderson inquired if there was any follow up on a by-law requiring contractors to build a certain percentage of accessible homes when completing developments. Ed Dujlovic stated that there are legalities associated with what municipalities can and cannot do with regards to the Ontario Building Code.

Peter Zein requested that staff invite representatives from the Social Services Department to the next AAC meeting to discuss accessible housing, including affordable housing in Stratford.

Motion by Diane Sims, seconded by Geoff Krauter

THAT the Stratford Accessibility Advisory Committee requests Social Services staff attend the April AAC meeting to discuss their mandate on accessible housing and how the AAC can work with them to fulfill that mandate.
Carried

Tatiana Dafoe will arrange with staff at Social Services to attend the April meeting to present housing information and have a discussion with the AAC on how they can assist Social Services.

6.0 Site Plans and Site Plan Review Sub-Committee Roles and Responsibilities

Alyssa Bridge reviewed what is shown on a site plan, what is not subject to site plan approval, what types of development require site plan approval and who reviews the site plans.

Ms. Bridge stated she supports the educational component that the AAC has with the feedback reports they provide on the site plan process. Whether a developer chooses to implement the feedback on a particular project or not, the City does not have the authority to require them to do so. It does plant a seed and provide the opportunity to get them thinking about what they can possibly integrate into future projects.

Diane Sims inquired how the AAC can provide input to developers on the inside of their buildings. Alyssa Bridge explained that the site plan reviews are limited to the development of the exterior of the building and the exterior function of the site.

Jonathan DeWeerd stated that the Ontario Building Code regulates the interior of buildings, providing minimum barrier-free standards for builders to follow.

Peter Zein inquired if there is a separate barrier-free design section or is it within the document. Jonathan DeWeerd stated that it is integrated within Section 3.8 in the Ontario Building Code.

Tatiana Dafoe stated that if the AAC would like to see specific changes with respect to the interior design of buildings, there would have to be an amendment to the Ontario Building Code Act. The AAC could make a motion to lobby for this change, should they choose to do so.

Peter Zein inquired why some site plans are reviewed by the AAC and other plans are not sent to them for review and feedback. Alyssa Bridge will investigate the internal review process regarding private developments.

Tyler Sager reviewed the process for the AAC to review site plans. He discussed that the role of the AAC is to provide advice to municipalities, however the advice they provide may not always be endorsed. Mr. Sager will work on creating a checklist to standardize feedback from both the County of Perth and the City of Stratford. This way, developers will receive the same feedback form no matter where they are building.

Tatiana Dafoe reviewed the next steps and requested members e-mail their feedback on what they would like to achieve while serving as a member on the AAC. Specific information was requested on:

- goals for individual members,
- how they think they can achieve them,
- if there are any specific projects they would like to work on, and
- if there are any amendments they would like to make to the terms of reference.

Ms. Dafoe will compile a report with feedback received for discussion at the next meeting.

7.0 Next Meeting – Tuesday, April 6, 2021 at 11:30 a.m., electronically

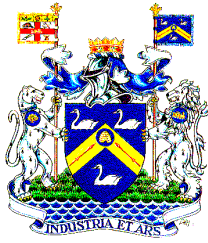
8.0 Adjournment

Motion by Judy Hopf, seconded by Judy Geoff Krauter

**THAT the March 2, 2021 Accessibility Advisory Committee meeting adjourn.
Carried**

Start Time: 11:31 A.M.

End Time: 1:07 P.M.



A meeting of the Active Transportation Advisory Committee (ATAC) was held on February 24, 2021 at 7:02 p.m., electronically.

Committee Present: David Daglish – Chair presiding, Councillor Burbach – Vice-chair, Councillor Vassilakos, Wayne Sjaarda, John Zelek and Lee Chandler

Staff Present: Tatiana Dafoe – City Clerk and Nancy Bridges – Recording Secretary

Also Present: Laura Edgar – HPPH and Anna Stratton

Regrets: Bernard Goward and Stephen Barlow

MINUTES

1. Call to Order

The Chair called the ATAC meeting to order at 7:02 p.m.

2. Declarations of Pecuniary Interest and the General Nature Thereof

None declared.

3. Adoption of Previous Minutes

Motion by Councillor Vassilakos, seconded by Councillor Burbach

**THAT the ATAC minutes dated January 27, 2021 be adopted as printed.
Carried**

4. Business Arising from Previous Minutes

a. Update on partnership with Destination Stratford (map)

Councillor Vassilakos spoke to Zach Gribble, CEO of Destination Stratford, regarding partnering with Destination Stratford on the active transportation map and he thought the project would be a good fit. Councillor Vassilakos noted she will send out a meeting request to the mapping sub-group to meet with Destination Stratford. The Committee agreed they should also be communicating with the Avon Trail on this project.

Councillor Vassilakos advised the City is currently undertaking a large wayfinding project and this will address the Avon Trail signage within the City. The City Clerk advised a comprehensive wayfinding strategy was developed in 2019. Following adoption of the plan, the intent was to create an implementation plan in 2020 however this project was paused

as a result of the COVID-19 pandemic. It is staff's intent to continue working on this project in 2021. Information will be presented at an upcoming Committee meeting on the project and on proposed signage for trails.

b. Report Card design update

Councillor Burbach introduced Anna Stratton as the unofficial Energy & Environment representative for ATAC. Her appointment will be presented to Council for approval in March.

Councillor Burbach noted she used information from other municipalities to create a draft report card for the Committee. The measures of success she included are:

- Infrastructure (ex. Sidewalks, bike parking, multi-use trails, etc.)
- Connections
- Culture
- Safety

Councillor Vassilakos noted it would be interesting to include AODA Accessible Built Environment targets on the report card as well as bench inventory.

Councillor Burbach noted the Connections section could include items such as:

- Transit riders
- People walking/cycling to work

John Zelek suggested including people walking/cycling to commercial areas. He noted the Chamber of Commerce may have data that could be included. The Committee also identified the following items to be included in the report card:

- Intercity transit riders
- Pedestrians using certain streets

A goal the Committee would like included on the report card is the inclusion of bike racks on the intercity transit busses.

Councillor Burbach noted the Connections section could include items such as:

- Signage/wayfinding
- Number of cycling/walking events

Councillor Vassilakos recommended including bike rodeos, Canada Day ride, Car Free Fridays and other active transportation fundraisers.

The Safety section could include collision data, speed limits and bike thefts. Councillor Vassilakos volunteered to reach out to Stratford Police Services for updated data.

The Committee discussed the layout of the report card and the need to include goals. Councillor Burbach recommended using 2016 as a baseline comparison. Goals will need to be based on the new Bike and Pedestrian Master Plan that is currently under review. Mr. Zelek noted he would like to see the Committee's achievements measured against other similar municipalities.

Councillor Burbach will update the draft report card and present the revised version at the March Committee meeting.

The Committee had a short discussion on truck routes and Provincial connecting links and the involvement of the Ministry of Transportation Ontario when making decisions on these links.

5. New Business

a) **Project priorities – to be discussed with Accessibility Advisory Committee at their April meeting**

The Committee discussed the areas for improvement and identified the following as priorities:

- Delamere to Martin missing sidewalk
- Forman Avenue and Huron Street intersection, SE sidewalk missing
- Forman Avenue sidewalk missing beside Stratford District Secondary School
- Forman Avenue bicycle lane ends
- Worsley Street sidewalk missing from Birmingham Street to parking lot
- Second sidewalk on Devon Street
- Missing sidewalks on Willow Street

Councillor Vassilakos noted the Huron Street reconstruction report may address the safety issues at the Forman Avenue and Huron Street intersection.

Motion by Councillor Burbach, seconded by John Zelek

THAT ATAC recommend to staff that the intersection of Huron Street and Forman Avenue be flagged in the Huron Street Reconstruction Project for a lack of safety for pedestrians on the South East side due to a missing sidewalk. Carried.

The Committee discussed the difficulties in completing the sidewalk on Worsley Street due to the lack of land available. Expropriating property would be required to complete the project. Mr. Zelek suggested

recommending the street be changed to one-way. Councillor Vassilakos noted that one-way streets tend to increase speeds and could reduce safety around the school.

Mr. Daglish noted an area of concern is the pedestrian access to the Festival Marketplace Shopping Centre. Councillor Vassilakos noted the mall is private property and that new standards in site plans will address these issues in new developments.

A brief discussion occurred regarding the positives of the closure of Lakeside Drive during the summer months. Councillor Vassilakos noted a report will be going to Council to review pedestrian/cycling within the parks system.

b) Next Meeting Date – Wednesday, March 24, 2021 at 7:00 p.m., electronically.

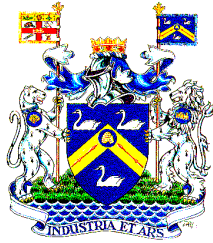
c) Adjournment

Motion by Councillor Burbach, seconded by Wayne Sjaarda

THAT the February 24, 2021 ATAC meeting adjourn. Carried

Start time: 7:03 P.M.

End time: 8:17 P.M.



A meeting of the Energy & Environment Advisory Committee was held on March 4, 2021 at 4:00 p.m., electronically.

Members Present: *Emily Chandler – Chair Presiding, Councillor Jo-Dee Burbach, Vanni Azzano, Mike Jorna, *Sammie Orr, Anna Stratton, Geoff Krauter, Anita Jacobsen, Emily Skelding, Councillor Bonnie Henderson, *Mike Sullivan

Staff Present: Tatiana Dafoe – City Clerk, Chris Bantock – Deputy Clerk, Rebecca Garlick – Climate Change Coordinator, Casey Riehl – Recording Secretary

Regrets: Craig Merkley, Kate Simpson – Waste Reduction Coordinator

MINUTES

1.0 Call to Order

The Chair called the meeting to order at 4:02 p.m.

2.0 Disclosure of Pecuniary Interest and the General Nature Thereof.

None declared.

3.0 Adoption of the Previous Minutes

Motion by Councillor Burbach, seconded by Mike Jorna

THAT the minutes from the Energy & Environment Advisory Committee meeting dated February 4, 2020 be adopted as printed. Carried

*Mike Sullivan and Sammie Orr now present at the meeting at 4:04 p.m.

4.0 Delegate: Rebecca Garlick, Climate Change Coordinator – GHG Report Presentation & Climate Action Plan Discussion

Rebecca Garlick reviewed how much Stratford would have to reduce per sector to meet

the reduction target, such as retrofitting homes (3,000), removing vehicles from the road (5,300 cars total) and converting vehicles to electric.

Anita Jacobsen inquired how many homes there are in Stratford. Ms. Garlick advised there are approximately 13,600 dwellings (2016 census).

Councillor Burbach inquired what the emissions rate from 2017 are in tons. Ms. Garlick stated it is 277,156.55 tons. If 20% of households were retrofitted, it would be approximately 3,000 tons.

Vanni Azzano inquired what the emissions percentages are per sector? Ms. Garlick reported the following:

Commercial/Institutional	13%
Residential	16%
Manufacturing/Industry	18%
On-Road	39%
Solid Waste	14%

Mr. Azzano suggested that the focus should be on the sectors with the highest percentages. Ms. Garlick noted that transportation is the largest contributor, however it is one of the more difficult sectors to make transitions. Focusing on active transportation and encouraging people to change from using their private vehicles and choose low emissions transportation are attainable first steps for this sector.

Councillor Henderson inquired if all new homes in Stratford are being built to be energy efficient, and if not, whether they need to be retrofitted. She suggested the Stratford and Area Builders Association would be an asset to inform new home builders.

Councillor Henderson also inquired if apartment buildings are included in the residential statistics. Ms. Garlick stated that they are not included. Councillor Henderson further inquired how changes such as people buying electric cars and retrofits are tracked. Ms. Garlick stated that information from the MTO provides electric vehicle stats and you would see the changes from retrofits in the consumption numbers from Festival Hydro and Enbridge Gas.

Mike Sullivan inquired if there are industrial processes emitting gases that are not included in these percentages. Ms. Garlick stated that the industry processes and commercial emissions that come from business practices, are not included in this count. They are Scope 3 emissions and they would be required to report their numbers to the national inventory and not included in community emissions. Mr. Sullivan stated that,

with only 29 years left until the deadline, people should not buy another gasoline engine car, no matter how much the difference in price is. He feels this should be promoted more in Stratford and believes car dealers should be encouraging this more. He also noted that there is no special infrastructure required at your house for an electric car. They can be plugged into 110 volts and charged overnight. Mr. Sullivan stated that people need to be replacing their gas furnaces now with electric furnaces. This way they have already switched to electric when a furnace replacement is required and not investing in a new gas one, only to have to replace with electric down the road.

Mike Sullivan inquired if Rebecca Garlick had costs to compare the difference in price between an electric heat pump and a gas furnace on a replacement basis. It was suggested the City could provide an incentive to help with the difference. Ms. Garlick will investigate the cost difference and provide those figures. Mr. Sullivan inquired if Ms. Garlick believes Stratford should have a higher target than 10%. Ms. Garlick stated that she would always encourage an ambitious target.

Mike Jorna stated the City should insist on higher standards for builders. Prevention of heat loss is very important in buildings. Insulation, air filtration and quality windows are all ways to prevent heat loss. Mr. Jorna also stated that the City should set an example and convert their fleet vehicles to electric. It would make the concept a lot easier for the community to consider if the City set a good example. Councillor Henderson stated that Stratford received a 5-year grant to purchase buses and in 2023 the plan is to possibly start converting to electric. As far as smaller fleet vehicles, when electric vehicles such as trucks become more widely available, they will be investigating options. Mr. Jorna added that if Police vehicles were included in this, you might see a large reduction in idling in the city. Councillor Henderson reported that last year the Police Department bought two hybrid and one gas powered vehicle to do a direct cost comparison between the two types to help decide on future vehicle purchases. She suggested contacting the Police to inquire on their findings. Mike Sullivan added that the Federal Government announced that there is funding for municipalities to purchase electric buses and announced which factories will be building the buses. Stratford should consider accessing some of this money.

Chris Bantock reviewed the current undertakings by staff as a result of a report that was presented to Council. Council did approve staff reporting back on three initiatives:

1. the anti-idling by-law,
2. electric vehicle charging stations, and
3. corporate adoption of the One Planet Living Principles.

Mr. Bantock requested the Committee to take the lead on researching other municipal by-laws to help improve Stratford's current anti-idling by-law. Items such as signage, and education could be investigated and reported back at the April E&E meeting for next steps. Councillor Henderson has done some initial research and has found that other municipalities have removed the temperature criteria and reduced the time to one minute.

Mr. Bantock suggested the Committee consider making a recommendation to Council to support certain initiatives, to give Council some time to review the community plan and have further discussions on setting a target. Vanni Azzano inquired if the three initiatives are connected to the end goal of reducing the target. Mr. Bantock advised the initiatives are a starting point for Council to provide direction to staff to investigate further and bring back reports with further details on costs, requirements, and information on how it contributes to a reduction.

Councillor Burbach, Councillor Henderson and Emily Chandler volunteered to complete the research on the anti-idling by-law and report back to the Committee at the April meeting.

Mike Jorna stated that targets can be abstract and difficult and it is easy to latch onto a certain target thinking it is a great idea, however if the intent is to reach the ultimate target of net zero by 2050, setting targets is necessary. One of the functions of the Committee is to provide Council with guidance on how to take certain actions on various targets.

Motion by Mike Jorna, seconded by Mike Sullivan

THAT the Energy & Environment Advisory Committee requests Council include in all future tender call specifications that all fleet vehicles purchased be electric.

Carried

Councillor Henderson stated that charging times for electric transit buses will have to be a consideration, especially during the winter. The new transit hub will also need to have charging stations installed. Mike Sullivan added that it takes three hours to fully charge an electric bus. As an example, the City of Toronto charges their buses overnight in preparation for their longest routes of 200-250 kms in the morning and then do a partial charge for a shorter route in the afternoon.

Anna Stratton inquired what the City's plan is for using the One Planet Living Principals. Chris Bantock explained that the intent is to place the principals in some form through management report templates, like the strategic initiatives currently on the template.

Anna Stratton inquired if Rebecca Garlick had a date set for when she would be presenting her report to Council. Ms. Garlick advised she was meeting with the CAO's on March 5, 2021 to discuss a date. Ms. Stratton also inquired if the results of the survey showed residents were in favour of a higher target. Ms. Garlick agreed that the results show that most respondents were in support of an approximate 30% reduction target.

Ms. Stratton inquired how the City can encourage retrofitting and rethinking reductions in the commercial and industrial sectors. Ms. Garlick stated that the Federal Government does have assistance for industrial and manufacturing facilities to reduce their emissions. However, it is voluntary. For commercial, there are programs similar to the residential ones.

Emily Skelding inquired if the tractor trailers and transportation are included in the industrial and solid waste figures or does that move over to the transportation category. Ms. Garlick reported that they are not included. She was not able to collect that data, as Stratford does not collect that information based on their size.

Emily Skelding inquired if the green bin program was processed in Stratford, would it decrease the figures. Ms. Garlick stated that it would significantly decrease the emissions not having the trucks travel to London. Councillor Burbach noted that when the green bin program was instituted last year, the renewable natural gas project was in the initial planning stages to keep it in Stratford. She stated that the trucks are dual trucks that can pick up garbage and compost.

Councillor Burbach inquired if green building standards, such as Whitby's green development plan, could be recommended as Stratford is putting their plan forward. Ms. Garlick has not seen the Whitby plan, but has researched some from other rural municipalities. The Clean Air Partnership developed a tool for municipalities to develop their own green building standards, which will be included in the plan.

Geoff Krauter inquired if the 10% target is county wide, or for example could Stratford and St. Mary's possibly have a different target than the rest of Perth County. Ms. Garlick reported she will present all the information to allow Council to decide on what they feel the best target will be for the City of Stratford.

Sammie Orr suggested that as an advisory committee, E&E should put a motion forward to Council to raise the reduction target. Geoff Krauter suggested that given the recent Perth County survey showing most residents who participated support a 30% target, that this information should be included in the motion.

Motion by Sammie Orr, seconded by Mike Sullivan

THAT the Energy & Environment Advisory Committee, following consideration of the Perth County climate survey results, recommends Stratford City Council adopt an emissions reduction target of 30% below 2017 levels by 2030 and commit to being net-zero by 2050.

Carried

5.0 Updates from Carbon Reduction & Ecological Working Groups

Ecological Update

No new updates.

Carbon Reduction Update

The working group provided the Committee with their notes from the last meeting. Their next meeting is on March 12, 2021. If Committee members have any ideas for hosts or panelists for webinars, please forward. It was questioned whether the ecological working group would like to take on the June webinar related to yards and gardens. Emily Chandler advised that they have been in contact with the Stratford Field Naturalist regarding an invasive species webinar. A meeting is scheduled with the City's Communication Lead to discuss promoting the webinars on social media. Members were asked to forward any suggestions for a name for the webinar series to Anna Stratton.

6.0 Business Arising from Previous Minutes

(a) 2021 Project Plans and Budget Update

Avon River Shoreline

Emily Chandler reported that the kayak launch has been completed.

(b) Nature Canada – Mike Sullivan

Mike Sullivan reported that National Resources Canada has set aside funds for tree planting. There are two calls for proposals. One is a quick turnaround to plant a minimum of 5,000 trees, however it does not appear there are 5,000 trees available. There is a longer-term initiative that might be a little more realistic. He has forwarded the information to the UTRCA. Vanni Azzano stated the ecological working group will take over the project and partner with UTCRA and the Parks & Forestry Manager for the City.

(c) Update on Energy Efficient Building Requirements – Mike Sullivan

Mike Sullivan forwarded some information on a course for learning about passive

houses. He plans on attending the virtual course and will share the information with members after. He has not received a response from the City regarding the development charges and tax relief. Tatiana Dafoe reported that she does not have an update and will e-mail as soon as she has received information. Councillor Burbach stated that the Whitby Green Development would possibly be a good model to gain some information. Mike Sullivan has been asked if the Cooper site development will be passively heated, fully green, energy efficient and a carbon neutral development. Councillor Burbach stated there have been proposals put together, however they are not close to final planning stages. She will keep the Committee updated with any new information.

*Emily Chandler no longer present at the meeting at 5:48 p.m.

*Anna Stratton assumed the role of Chair.

(d) Re-Usable Container Program for Stratford – Sammie Orr

Sammie Orr reported that they have had their first meeting and it went very well. They discussed various concerns and ideas and main points, such as communication, City responsibilities, restaurant association, storage, pick up and cleaning. They have reached out to representatives at A Friendlier Company and have a meeting with them to discuss bringing their program to Stratford.

(e) Recommendation to Phase Out Ontario's Gas Plants – Emily Chandler

Anna Stratton inquired if Committee members have reviewed the information provided at the last meeting and are prepared to make a motion in support of the gas plant phase out in Ontario. Mike Jorna suggested it would be a good idea for E&E to write a resolution specific to Stratford to send to the Province, as opposed to just endorsing one from another municipality. Mr. Jorna volunteered to draft a resolution for Council and present it to E&E members at the April meeting. Sammie Orr suggested that Kingston's resolution is a good example and the resolution should also be sent to the Federal Government. She also suggested the declaration of a climate emergency should be included in the resolution.

(f) Ground Source Heating Options for the City – Mike Jorna/Tatiana Dafoe

Tatiana Dafoe reported that the City's Director of Infrastructure & Development Services has recently retired, however is continuing to work on some projects. He will be attending a seminar on this topic and the intent will be to schedule a presentation at a future meeting.

(g) Campaign to Reduce Food Waste – Kate Simpson

Deferred to next meeting.

(h) E&E Representative for Active Transportation Advisory Committee (ATAC)

Anna Stratton volunteered to be the E&E representative for ATAC and suggested that perhaps moving forward one of the duties of the Vice-Chair would be to attend ATAC as the E&E representative. Councillor Henderson stated that it may not always be feasible for the Vice-Chair to attend ATAC meetings and may eliminate someone from the position. Sammie Orr suggested a rotating representative may work.

Motion by Councillor Henderson, seconded by Councillor Burbach

THAT the Energy & Environment Advisory Committee nominates Anna Stratton as the E&E representative to serve on the Active Transportation Advisory Committee for 2021.

Carried

Motion by Anna Stratton, seconded by Councillor Burbach

THAT the Energy & Environment Advisory Committee requests amending the Terms of Reference for the Committee to reflect that part of the duties of the Vice-Chair of E&E would be to act as the E&E representative and attend the Active Transportation Advisory Committee meetings.

Carried

7.0 New Business**(a) SDSS Eco Club Update – Sammie Orr**

Sammie Orr reported that the Eco Club would like to present to the E&E Committee to give an update on the compost cow and their plans for the bins. They are also working with the green industries course to plant trees, possibly a garden and some benches for an outdoor classroom in an area where portables were removed.

8.0 Upcoming Events

Tree Power Event – April 9-10, 2021.

9.0 Next Meeting Date – April 1, 2021 – 4:00 p.m., electronically

10.0 ADJOURNMENT

Motion by Mike Jorna, seconded by Geoff Krauter

THAT the March 4, 2021 Energy & Environment Advisory Committee meeting adjourn. Carried

Meeting Start Time 4:02 P.M.

Meeting End Time: 6:07 P.M.