

**COMMITTEE OF THE WHOLE COUNCIL MEETING
January 16, 2024**

The meeting was called to order by the Chair at 7:10 p.m., in the Conference Room, in the Administrative Centre, in Barrington, N.S., with the following members present:

- George El-Jakl, Chair
- Jody Crook
- Shaun Hatfield
- Lindsay (Eddie) Nickerson
- Andrea Mood-Nickerson (7:13 p.m.)

- Chris Frotten, CAO
- Lesa Rossetti, Municipal Clerk

APPROVAL OF AGENDA

Being duly moved and seconded that the agenda be approved as circulated.

Motion carried unanimously.

APPROVAL OF MINUTES

Being duly moved and seconded that minutes of the last meeting held January 9, 2024, be approved as circulated.

Motion carried unanimously.

MATTERS ARISING FROM PREVIOUS MEETINGS

There were no matters arising from previous meetings.

PRESENTATION – SPECIAL EVENTS GRANT REQUEST RE: UFO XPO

Danny Reid, Treasurer, The Shag Harbour Incident Society, appeared before the meeting to request a Special Events Grant in the amount of \$3,000.00. This funding will be used to assist with the cost of holding the 3rd Annual UFO XPO, in 2024 which will be held at the Rodd Grand Hotel Conference Centre, in Yarmouth.

It was the consensus of members that the Special Events Grant request be considered during budget deliberations.

Mr. Reid was thanked for his presentation and left the meeting.

2024 MUNICIPAL ELECTION

In advance of the meeting, members were provided with a Staff Report which outlined required actions of Council in preparation for the 2024 Municipal Election. A copy of the Staff Report is attached and forms part of the minutes.

Much discussion took place regarding various aspects of the upcoming election.

Resolution COW240102

Being duly moved and seconded that it be recommended to Council that staff be authorized to conduct the 2024 Municipal Election as outlined below:

1. That Council give authority to the Chief Administrative Officer to determine the Tariff of Fees and Expenses for the 2024 Municipal Election.
2. That Council give authority to the Returning Officer to appoint Assistant Returning Officer(s).
3. That Council agree to utilize alternative voting methods (internet and phone) from a to be determined vendor for the 2024 Municipal Election.
4. That Council set the dates for the advance polling period from Thursday, October 10, 2024, to the end of October 18, 2024, by electronic voting only. With Ordinary Polling Day being conducted using paper ballots only.
5. That Council agree that in addition to the methods mandated by the Municipal Elections Act to notify the public of the preliminary list of electors and revision methods, that it be left to the discretion of the Returning Officer to determine additional notification mechanisms that will improve the accuracy of the electors' lists.
6. That Council authorizes election staff to continue to amend the electors' list database in conjunction with the electronic voting system up to and including Ordinary Polling Day, being October 19, 2024.
7. That Council authorizes the use of the Nova Scotia permanent registry of voters provided by Elections Nova Scotia as the preliminary list of electors for the 2024 Municipal Election for the Municipality.

Motion carried unanimously.

TOWN OF CLARKS HARBOUR WASTEWATER TREATMENT FACILITY

Correspondence has been received from the Town of Clarks Harbour requesting to know whether Council is interested in participating in the construction of a new wastewater treatment facility to serve residents of both the Town of Clarks Harbour and the Municipality of Barrington. The Town has indicated that they would be willing to enter into a 50/50 cost shared arrangement for such a facility. Members were provided with a copy of the Wastewater Feasibility Study. Copies of the letter and study are attached and form part of the minutes.

Much discussion took place regarding options outlined in the feasibility study and possible next step.

Resolution COW240103

Being duly moved and seconded that the following resolution be recommended to Council:

WHEREAS there has been a feasibility study done and it indicates that there are viable and affordable options to construct a sewer on Cape Sable Island;

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AND WHEREAS there are environmental concerns with on-site septic systems that are not working properly;

AND WHEREAS it is usually looked upon favourably when multiple units work together on common infrastructure that will benefit both communities;

AND WHEREAS additional information will be needed for ownership structure and financial models;

THEREFORE BE IT RESOLVED to continue to explore the options to construct a public sewer on Cape Sable Island with the Town of Clarks Harbour.

AFFIRMATION

Jody Crook

Shaun Hatfield

Andrea Mood-Nickerson

Lindsay (Eddie) Nickerson

NEGATIVE

George El-Jakl

Motion carried.

ENDORSEMENT OF EQUIPMENT PURCHASES

Correspondence has been received from the Barrington Port LaTour Volunteer Fire Department advising of their plans to purchase equipment.

Resolution COW240104

Being duly moved and seconded that it be recommended to Council that the Municipality endorse the purchase of a 2024 Dodge ¾ ton truck with cap and a replacement pumper truck consistent with the Truck Replacement Plan of the Barrington Port LaTour Volunteer Fire Department.

Motion carried unanimously.

SPRING/FALL CLEAN UPS

A Staff Report was circulated to members in advance of the meeting regarding a single special clean-up which will replace the former Spring and Fall Clean-ups. A copy of the Staff Report is attached and forms part of the minutes.

Resolution COW240105

Being duly moved and seconded that it be recommended to Council that the one single special clean-up in 2024/25 and the single clean-ups conducted in subsequent years be held in early to mid-September.

Motion carried unanimously.

NSFM UPDATE

In advance to the meeting members were provided with a NSFM Monday Memo Summary Sheet covering the period November 21, 2023 to January 15, 2024.

IN-CAMERA SESSION

At 10:20 p.m. an In-Camera Session was held in accordance with Section 22(2)(e) of the Municipal Government Act to deal with contract negotiations.

The meeting returned to open session at 10:37 p.m.

REPORT ON IN-CAMERA SESSION

During the In-Camera Session direction was given to the CAO regarding physician agreements.

ADJOURNMENT

The meeting was adjourned at 10:38 p.m.

Chair

Secretary for the Meeting



STAFF REPORT
SUBMITTED BY: Chris Frotten
DATE: January 9, 2024
SUBJECT: 2024 Municipal Election – Report 1
STRATEGIC OBJECTIVE: N/A

ORIGIN

Planning has begun for the 2024 Municipal and CSAP Elections (Election). Council direction is required in certain areas to proceed.

BACKGROUND

The *Nova Scotia Municipal Elections Act* (Act) is the main statute governing all elections for municipal councils and the CSAP. The Act (s. 10) stipulates that the election of councillors shall be held on the third Saturday in October in the year 2000 and on the third Saturday in October in every fourth year thereafter. October 19, 2024, is the date of the next municipal election.

The 2020 Municipal Election was held on October 17, 2020, using paper balloting only. A total of 13 candidates were nominated for election. Voter turnout was approximately 43.5% and the election resulted in 1 new member of the 5-member Council.

There are a number of legislative requirements of the Act regarding the election, and this report seeks Council direction on these matters.

DISCUSSION

Appointment of Returning Officer

Section 4 of the Act requires Council to appoint a Returning Officer to conduct the Election by March 15, 2024. The Returning Officer is responsible for all matters related to the conduct of the municipal and CSAP Election (election), including voting procedures, division and location of polling stations, and any other matters that ensures voting is conducted and reported in a fair and accurate manner and in compliance with the legislation. The Returning Officer may be the Clerk, another municipal employee, or another person who is not a municipal employee. Staff is recommending that another person who is not a

municipal employee, be appointed as the Returning Officer. This position would be advertised, and an official appointment would be made in February.

List of Electors

Subsection 30(1) of the Act requires, by April 15, 2024, Council to decide to either use the provincial list of electors from Elections Nova Scotia or conduct an enumeration.

Council has decided to use the provincial list of electors for past elections and Staff is recommending continuing this practice. The information is provided by Elections Nova Scotia. Before the data can be provided by Elections Nova Scotia, the Act requires a data sharing agreement be signed with Elections Nova Scotia and Council. If Council directs the use of the preliminary list of electors, staff will bring forward the draft agreement with Elections Nova Scotia to Council for approval.

Advance Polls

Section 114(4) of the Act provides for an advance poll on Tuesday, the fourth day before regular poll (October 15). Council must select one other day or delegate its authority to select the first advanced poll to the Returning Officer. The choices are either Thursday, the ninth day before ordinary polling day (October 10) or Saturday, the seventh day before ordinary polling (October 12). In addition, our Alternative Voting By-Law allows for advance polling to be any other day or days set by resolution of Council no sooner than the eleventh day before Ordinary Polling Day.

Delegation - Assistant Returning Officer

The Act allows Council to appoint one or more Assistant Returning Officers. An Assistant Returning Officer assists the Returning Officer in carrying out their duties and acts in the place of the Returning Officer when the Returning Officer is absent or at their request. Since 2011, the Act has allowed Council the option to delegate its authority to appoint one or more Assistant Returning Officers and we recommend that delegation of authority to the Returning Officer.

Delegation – Tariff of Fees

The Act requires a tariff of fees be set. The tariff sets the amounts that are paid for various positions, such as a deputy returning officer, and a poll clerk. Since 2011, the Act allows Council the option to delegate its authority to make and amend the tariff of fees and we recommend that delegation of authority to the Chief Administrative Officer.

Electronic Voting

In April 2023, an Alternative Voting By-Law was passed (attached), which allows for alternative voting methods for municipal elections, such as voting by telephone or via the internet or a combination thereof.

As explained in a report presented to Committee of the Whole in November 2022 (attached), electronic voting is becoming increasingly popular as the technology advances and improves. Provincially, other units started going paperless in the 2016 election and in 2020, 41 municipalities used electronic voting in some

way – 68% of those offering electronic voting only. Other municipal units have also started their 2024 planning, and most are recommending electronic options to their respective Council's. There are different formats in which you can provide electronic voting. For example, some use it during advance polls only while others provide both paper and electronic voting methods simultaneously.

This year, there is a concern provincially with the anticipated lack of potential election staff. It is expected that finding workers will be extremely difficult and certainly the pay rates would need to be significantly higher than in previous years to meet current market demands.

For the reasons listed above, it is recommended that the 2024 Municipal Election be conducted using a hybrid model (paper and electronic).

Implementing a hybrid voting model for the first time, which will combine electronic voting and a paper option, offers a balanced approach that addresses the concerns and preferences of a diverse electorate. This approach aims to gradually transition towards modern technology while ensuring inclusivity and maintaining the trust and familiarity associated with traditional paper ballots.

Based on lessons learned from the past elections, Staff recommends implementing electronic voting exclusively for advance polls and switching to paper ballots only on ordinary polling day. This recommendation is driven by a combination of practical considerations, security considerations, and a desire to accommodate different voter preferences.

Implementing both systems at the same time may require more physical space at polling stations and additional resources, such as power sources and technical support, leading to increased logistical demands. Voters may be confused when faced with two different voting methods on the same day. Finally, having both electronic and paper systems available on the same day increases the potential points of vulnerability for election interference or fraud.

To gain a better understanding of how electronic voting works, attached is a brochure from Intelivote Systems Inc. regarding the 2024 municipal election. Although they may not be the chosen vendor to provide electronic voting services, they have been the leading vendor in Nova Scotia for the last few elections and their brochure provides valuable information.

The proposed schedule under this model would be the following:

- September 10, 2024 – Nomination Day
- October 10, 2024 to October 18, 2024 – Advance Polling Period – 100% electronic (internet and phone)
- October 19, 2024 – Ordinary Polling Day – 100% paper

Candidates Deposit

Section 51(1) of the Act states that every nomination paper shall be accompanied by a deposit of \$200. That said, Council may by by-law specify that a lesser deposit, or no deposit, shall be required. Staff recommends that Council comply with the Act and Bylaw #149 (Respecting Deposits by Candidates at an

Election) with no changes as there needs to be some commitment to potential candidates to the election process to make the process a serious one.

Notice of Preliminary List

Section 34(1) of the Act requires the availability of the preliminary list of voters to be advertised in newspapers circulating in the Municipality.

Section 34(4) outlines other mechanisms to notify voters but is only necessary if directed by Council. The other mechanisms include:

- a. Distributing flyers to households
- b. Mailing cards to voters
- c. Providing for other advertisements as directed by Council

Date of Final List

Section 38 of the Act refers to a date selected by Council on which the amended list of voters is finalized. Decisions on the final list must be done in time to allow the lists to be printed. With use of electronic voting, the lists are available electronically and printed lists would not be necessary.

BUDGET IMPLICATIONS

In an election year, we typically budget approximately \$25,000. This includes expenses related to the Returning Officer, election workers, hall rentals, polling station supplies and ballots. Implementing a hybrid model is not expected to increase costs as there will be fewer polling stations on ordinary polling day, thus less election workers will be hired and not as many spaces will have to be rented for polling stations.

LEGAL IMPLICATIONS

The 2024 Election is legislatively required under the *Nova Scotia Municipal Elections Act* (<https://nslegislature.ca/sites/default/files/legc/statutes/municipal%20elections.pdf>)

PUBLIC CONSULTATION/COMMUNICATIONS

The Municipality completed a robust citizen engagement initiative during the 2020 regular election. Public engagement activities for 2024 have already commenced and a robust communications strategy will be developed.

RECOMMENDATION

It is recommended that Council authorize Staff to conduct the 2024 Municipal Election as outlined in the recommended motions below.

SUGGESTED MOTION

1. That Council give authority to the Chief Administrative Officer to determine the Tariff of Fees and Expenses for the 2024 Municipal Election.
2. That Council give authority to the Returning Officer to appoint Assistant Returning Officer(s).
3. That Council agree to utilize alternative voting methods (internet and phone) from a to be determined vendor for the 2024 Municipal Election.
4. That Council set the dates for the advance polling period from Thursday, October 10, 2024, to the end of October 18, 2024, by electronic voting only. With Ordinary Polling Day being conducted using paper ballots only.
5. That Council agrees that in addition to the methods mandated by the Municipal Elections Act to notify the public of the preliminary list of electors and revision methods, that it be left to the discretion of the Returning Officer to determine additional notification mechanisms that will improve the accuracy of the electors' lists.
6. That Council authorizes election staff to continue to amend the electors' list database in conjunction with the electronic voting system up to and including Ordinary Polling Day, being October 19, 2024.
7. That Council authorizes the use of the Nova Scotia permanent registry of voters provided by Elections Nova Scotia as the preliminary list of electors for the 2024 Municipal Election for the Municipality.

ALTERNATIVES

These recommendations are per the Act and therefore there are few alternatives.

- Council may decide to complete enumeration instead of using the elector data from Elections Nova Scotia, but that would not be recommended due to time and costs associated with completing enumeration.
- Council may choose to conduct the election 100% electronically or 100% paper.
- Council could choose to also delegate its authority to decide advance polls.

ATTACHMENTS

- By-Law 42 Alternative Voting By-Law
- November 2022 Electronic Voting Staff Report
- Intelivote Brochure – 2024 Municipal Election



Alternative Voting By-law By-law No. 42

Part 1 Purpose

1.1 The purpose of this by-law is to identify Alternative Voting methods for municipal elections.

Part 2 Definitions

2.1 **“Act”** means the Municipal Elections Act, 1989 R.S.N.S. c. 300, as amended;

2.2 **“Advance poll”** means:

2.2.1 the Tuesday immediately preceding Ordinary Polling Day; and

2.2.2 one other day fixed by the Council by resolution that is either Thursday, the ninth day before Ordinary Polling Day or Saturday, the seventh day before Ordinary Polling Day;

2.2.3 Any other day or days set by resolution of Council no sooner than the eleventh day before Ordinary Polling Day.

2.3 **“Alternative polling days”** means any dates fixed by a resolution of Council for Alternative Voting.

2.4 **“Alternative Voting”** means voting by telephone or via the internet and includes a combination of telephone and internet voting;

2.5 **“Ballot box”** means a computer database in the system where cast internet ballots and telephone ballots are put;

2.6 **“Candidate”** means a person who has been nominated as a candidate pursuant to the Act;

2.7 **“Council”** means the Council of the Municipality of the District of Barrington;

2.8 **“Election”** means an election held pursuant to the Act, including a school board election, a special

election, and a plebiscite;

2.9 “**Election Officer**” means an “election official” under the Act;

2.10 “**Elector**” means a person:

2.10.1 qualified to vote pursuant to the Act and the Education Act; and

2.10.2 entitled to vote on advance polling days for an election pursuant to this By-law;

2.11 “**Final list of electors**” means the final list of electors completed pursuant to the Act;

2.12 “**Friend voter**” means a friend who votes for an elector pursuant to this By-law;

2.13 “**Internet ballot**” means an image of a ballot on an internet enabled digital device screen, including all the choices available to an elector and the spaces in which an elector marks a vote;

2.14 “**Kiosk**” means an internet connected electronic device, such as a computer or tablet, which can be utilized to offer Alternative Voting at a convenient location;

2.15 “**Municipality**” means the Municipality of the District of Barrington;

2.16 “**Ordinary Polling Day**” means the third Saturday in October in a regular election year and in the case of any other election means the Saturday fixed for the election;

2.17 “**PIN**” means the Personal Identification Number issued to an elector for Alternative Voting on alternative polling days or on the Ordinary Polling Day;

2.18 “**Proxy voter**” means an elector who votes by a proxy pursuant to the Act;

2.19 “**Regular election year**” means 2024 and every fourth year thereafter;

2.20 “**Returning Officer**” means a Returning Officer appointed pursuant to the Act;

2.21 “**Seal**” means to secure the ballot box and prevent internet and telephone ballots from being cast;

2.22 “**Special election**” means a special election held pursuant to the Act, including a special election for a vacancy on a school board;

2.23 “**Spoiled ballot**” means an internet ballot or telephone ballot that has not been clearly marked for any candidate;

2.24 “**System**” means the technology, including software, that:

2.24.1 records and counts votes; and

2.24.2 processes and stores the results of Alternative Voting during advance polling days;

2.25 **“System Elections Officer”** means:

2.25.1 a person who maintains, monitors, or audits the system, and

2.25.2 a person who has access to the system beyond the access necessary to vote by Alternative Voting.

2.26 **“Telephone ballot”** means:

2.26.1 an audio set of instructions which describes the voting choices available to an elector; and

2.26.2 the marking of a selection by an elector by depressing the number on a touch tone keypad.

Part 3 Alternative Voting Permitted

3.1 Subject to this By-law, Alternative Voting may be permitted on advance polling days and on the Ordinary Polling Day where Council has passed a resolution permitting one or more forms of Alternative Voting for an Election. Such resolution shall specifically state whether, in addition to Alternative Voting, there will be voting by paper ballot. Where Council does not authorize voting by paper ballot the provisions of the Act with respect to paper ballot voting shall not apply.

3.2 The Municipality may elect to use Alternative Voting on the Ordinary Polling Day and make available the equipment to use Alternative Voting at any poll.

3.3 In the event the Municipality elects to use Alternative Voting on the Ordinary Polling Day, the Municipality shall ensure that the equipment to use Alternative Voting is available at any poll.

3.4 Where voting by Internet Ballot is permitted through the unsupervised use of a personal computing device voting must also be permitted by some other means, such as by Telephone Ballot and/or paper ballot, on each advance polling day and on Ordinary Polling Day.

3.5 Not fewer than 60 days before the Ordinary Polling Day, the Returning Officer is directed to establish procedures and forms for the conduct of voting in accordance with the by-law and to provide a copy of the procedures and forms to each candidate for election.

Part 4 Notification of Electors

4.1 The Returning Officer shall cause notice of advance polling days to be published in a newspaper circulating in the Municipality and to also be posted on the Municipal Website.

4.2 The notice of advance polling days shall:

4.2.1 identify the advance polling days for Alternative Voting;

- 4.2.2 inform electors that Alternative Voting is permitted during advance polling days.
- 4.3 The notice may include any other information the Returning Officer deems necessary to comply with the Act or this By-law.

Part 5 Form of Telephone and Internet Ballots

- 5.1 A telephone ballot and internet ballot shall:
 - 5.1.1 identify by the title “Election for Councillor”;
 - 5.1.2 identify candidate names or names by which they are commonly known, with given names followed by surnames, arranged alphabetically in order of their surnames and, where necessary, their given names; and
 - 5.1.3 warn the elector to “vote for one candidate only” or “vote for not more than (the number of candidates to be elected) candidates”, as the case may be.
- 5.2 No title, honour, decoration or degree shall be included with a candidate’s name on an internet ballot or telephone ballot.

Part 6 Oath

- 6.1 Any oaths that are authorized or required shall be made in the form required by the Act.

Part 7 Electors

- 7.1 No person shall vote by Alternative Voting unless:
 - 7.1.1 the person’s name appears on the final list of electors on the date for the final list of electors to be completed pursuant to the Act;
 - 7.1.2 The person’s name does not appear on the final list of electors and:
 - 7.1.2.1 the person appears before the Returning Officer during normal business hours during advance polling days; and
 - 7.1.2.2 the person swears an oath in the prescribed form to the Act.

Part 8 Proxy Voting

8.1 There shall be no voting by proxy by Alternative Voting.

Part 9 Kiosk Voting

9.1 The Returning Officer may establish a Kiosk at the Municipal Office during normal business hours that fall within the Alternative Polling Days. The Returning Officer shall also establish a Kiosk at locations the Returning Officer deems appropriate during the Alternative Polling Days. The dates, times and locations of this Kiosk will be established and published thirty (30) days prior to the commencement of the Alternative Polling Days.

Part 10 Friend Voting

10.1 A friend voter shall only vote for an elector by Alternative Voting if:

10.1.1 an elector is unable to vote because the elector is blind, the elector cannot read, or the elector has a physical disability that prevents them from voting by Alternative Voting; and

10.1.2 the elector and the friend appear in person before the Returning Officer and take the prescribed oaths.

10.2 A candidate shall not act as a friend voter unless the elector is a child, grandchild, brother, sister, parent, grandparent or spouse of the candidate.

10.3 The elector shall take an oath in the prescribed form providing that they are incapable of voting without assistance.

10.4 The friend of the elector shall take an oath in the prescribed form that:

10.4.1 the friend has not previously acted as a friend for any other elector in the election other than an elector who is a child, grandchild, brother, sister, parent, grandparent or spouse of the elector;

10.4.2 the friend will mark the ballot as requested by the elector; and

10.4.3 the friend will keep secret the choice of the elector.

10.5 Where the elector requests assistance, the Deputy Returning Officer or Returning Officer may act as a friend of the elector but shall not be required to take the oath referred to above.

10.6 The Deputy Returning Officer, Returning Officer or Poll Clerk shall enter in the log book:

10.6.1 the reason why the elector is unable to vote;

10.6.2 the name of the friend; and

10.6.3 the fact that the oaths were taken.

Part 11 Voting

11.1 The system shall put internet ballots and telephone ballots cast by an elector in the virtual ballot box.

Part 12 Seal

12.1 The system shall seal the virtual ballot box at the close of Ordinary Polling Day.

Part 13 List of Persons Who Voted

13.1 Following the close of Ordinary Polling Day, the system shall generate a list of all electors who voted by Alternative Voting, and this list shall be delivered to the Returning Officer within 24 hours.

Part 14 Counting

14.1 At the close of Ordinary Polling Day, the system shall generate a count of the telephone ballots and internet ballots in the ballot box that were cast for each candidate during advance polling days and on Ordinary Polling Day.

14.2 In counting the votes that were cast for each candidate during advance polling days and on Ordinary Polling Day, the system shall not count spoiled ballots.

Part 15 Tallying of Spoiled Ballots

15.1 At the close of Ordinary Polling Day, the system shall tally the number of spoiled ballots that were cast during advance polling days and on Ordinary Polling Day and the tally shall be delivered to the Returning Officer.

Part 16 Recount by System

16.1 In the event of a recount, the system shall regenerate the election count and a printed copy of the regenerated count shall be given to the Returning Officer.

16.2 If the initial count and the regenerated count match, the regenerated count shall be the final count of the votes cast by Alternative Voting.

- 16.3 If the regenerated count and the initial count do not match, the Returning Officer shall:
- 16.3.1 direct one final count be regenerated by the system of the votes cast by Alternative Voting, and
 - 16.3.2 attend while the final count is being regenerated.
- 16.4 The regenerated final count pursuant to this by-law shall be the final count of the votes cast by Alternative Voting.

Part 17 Recount by Court

- 17.1 For a recount, the judge shall only consider the final count by the system, as determined by this by-law, of the total number of votes that were cast by Alternative Voting for each candidate.

Part 18 Secrecy

- 18.1 An election officer and system election officers shall maintain and aid in maintaining the secrecy of the voting.
- 18.2 Every person in attendance at a polling station or at the counting of the votes, shall maintain and aid in maintaining the secrecy of the voting.

Part 19 Severability

- 19.1 If a court of competent jurisdiction should declare any section or part of a section of this By-law to be invalid, such section or part of a section shall not be construed as having persuaded or influenced Council to pass the remainder of the By-law and it is hereby declared that the remainder of the By-law shall be valid and shall remain in force.

Part 20 Prohibitions

- 20.1 No person shall:
- 20.1.1 use another's person's PIN to vote or access the system unless the person is a friend voter;
 - 20.1.2 take, seize, or deprive an elector of his or her PIN; or
 - 20.1.3 sell, gift, transfer, assign or purchase a PIN.
- 20.2 No person shall:

- 20.2.1 interfere or attempt to interfere with an elector who is casting an internet ballot or telephone ballot;
 - 20.2.2 interfere or attempt to interfere with Alternative Voting; or
 - 20.2.3 attempt to ascertain the name of the candidate for whom an elector is about to vote or has voted.
- 20.3 No person shall, at any time, communicate or attempt to communicate any information relating to the candidate for whom an elector has voted.

Part 21 Offences and Penalty

- 21.1 A person who:
- 21.1.1 violates any provision of this By-law; or
 - 21.1.2 permits anything to be done in violation of any provision of this By-law;
- is guilty of an offence.
- 21.2 A person who contravenes subsection (1) of this section is guilty of an offence and is liable, on summary conviction, to a penalty of not less than five thousand dollars (\$5,000.00) and not more than ten thousand dollars (\$10,000.00) and in default of payment, to imprisonment for a term of two years (2) less a day, or both.
- 21.3 In determining a penalty under subsection (2), a judge shall take into account:
- 21.3.1 the number of votes interfered with; and
 - 21.3.2 any potential interference with the outcome of an election.
- 21.4 Pursuant to Section 146A of the Act:
- 21.4.1 the limitation period for the prosecution of an offence under this By-law is two (2) years from the later of the date of the commission of the offence and the date on which it was discovered that an offence had been committed; and
 - 21.4.2 The Remission of Penalties Act, 1989 SNS c.397, as amended, does not apply to a pecuniary penalty imposed by this By-law.

Municipal Clerk's Annotation for Official By-law Book

Date of first reading:	February 28, 2023
Date of advertisement of Notice of Intent to Consider:	March 8, 2023
Date of second and final reading:	March 28, 2023
*Date of advertisement of Passage of By-law:	April 5, 2023
Date of mailing to Minister a certified copy of By-law:	April 5, 2023

I certify that Council adopted By-law No. 42 "Alternative Voting By-law" on March 28, 2023 and published as indicated above.

Lesa Rossetti,
Municipal Clerk

Date

*Effective Date of the By-law unless otherwise specified in the text of the By-Law.



STAFF REPORT

SUBMITTED BY: Chris Frotten

DATE: November 14, 2022

SUBJECT: Electronic Voting

ORIGIN

The next municipal elections will be held on Saturday, October 19th, 2024. In preparation, Staff is requesting direction from Council on whether electronic voting will be an available method in future elections.

BACKGROUND

Council's role in elections is to appoint a Returning Officer, approve the use of electors list, approve the electoral mechanism, election budget, election by-law and ensure that the method and system of voting are able to deliver fair elections and accurate results. Section 146A of the Municipal Elections Act bestows municipal councils with the legislative authority to select the method and system of voting.

Today, citizens can use the Internet to conduct their banking, make purchases and donations, sign petitions, renew and apply for government licenses and pay their taxes. The power of the Internet to transform the nature of traditional service delivery, particularly to improve communication and access to information, has raised interest in its uses to enhance the accessibility of the electoral process as well.

Its ability to create new participative spaces as well as expand existing ones suggests it has the capacity to improve accessibility to voting for many electors. Furthermore, the Internet's influence on other aspects of elections and government, such as campaigning, fundraising, membership recruitment, protest, lobbying and access to information for media and citizens, signifies that it now has an increasingly important relationship with electoral politics and will likely continue to have a considerable impact on the character of democracy in nations worldwide.

The newly emergent concept of electronic democracy suggests it may be useful to further explore the potential of the Internet to improve the electoral process for parties, groups, election administration, and of course, citizens. At the same time however, there remain many concerns surrounding the notion of Internet voting, primarily related to public confidence and trust in the security of the voting process. The goal of this report is to assess the considerations involved in the potential introduction of electronic voting in the next municipal election.

DISCUSSION

The term electronic voting is a blanket term used to describe an array of voting methods that operate using electronic technology. The following section discusses the benefits and risks associated with Internet voting in general, primarily concentrating on remote Internet voting.

Benefits

Proponents of electronic voting make several arguments in favour of its implementation. These are related to technology, social issues and election administration. First, electronic voting has the potential to make the **voting process easier** and **more accessible** for electors. This is especially true for remote Internet voting and telephone voting given that ballots can be cast from any computer with an Internet connection or any working telephone. These latter methods substantially lower the cost of voting for many electors by creating many more access points from which they are able to vote. There is the potential to eliminate long line-ups at polling stations and better address accessibility issues for persons with disabilities, those suffering from illness, those serving in the military or living abroad, those away on personal travel, snowbirds and other groups of citizens such as single parents who may find it difficult to visit a traditional polling station. Additionally, remote methods of Internet voting afford electors the opportunity of being able to **vote at any time**, a feature that further enables electors' ability to cast a ballot.

With regard to special populations of electors, Internet and telephone voting may also be methods of engaging those voters who are considered the hardest to reach, particularly **young people** aged 18 to 30. These electors are most familiar with the technology, are the most frequent reported users and would likely benefit the most from the extension of remote types of electronic voting. Internet and telephone voting seem to be especially useful ways of engaging young people away at university and who are not registered to vote in that particular constituency.

Internet and telephone voting could allow **greater secrecy** for special populations of electors with disabilities (including visually or hearing impaired). By voting electronically and therefore unassisted, these electors are afforded a greater degree of anonymity when casting a ballot. Enabling secrecy for these groups enhances the equality of the vote.

Enhancing accessibility and creating more participatory opportunities for electors holds promise to positively impact **voter turnout**. Generally, the academic literature addressing electronic voting and turnout decline presents inconclusive results concerning whether the extension of on-line voting has a positive effect on electoral participation. Cases in which remote methods were implemented have produced mixed results. Though some areas in Canadian municipalities that have reported some instances of increased turnout. The length of time remote Internet voting options remain in place appears to be related to increases in both its use and in voter turnout.

Related to administration, Internet and telephone voting are claimed to produce **faster and more accurate election results**. Internet and telephone voting systems are said to deliver a faster official ballot tabulation process and are alleged to be more accurate than other types of counting which are sometimes

criticized for error. In addition, fewer election facilities, election workers and election supplies are required, thus reducing the burden of choosing fair locations and searching for workers.

Over the long term all types of Internet voting have the potential to be **less expensive** to operate and execute than traditional paper ballots which require setting up and staffing polls. However, the start-up costs for machines or kiosks can be very high.

Finally, all types of Internet voting and telephone voting have the potential to improve the overall quality of ballots cast by reducing or eliminating ballot errors and by creating better informed electors. There can be **no ballot errors**, and, if the legal structure in a jurisdiction requires the option to **spoil a ballot** or allows for protest votes, a button can be added in some programs to give electors the option to cast a protest vote (or decline to vote). Furthermore, depending on the architecture of the Internet voting system, there is the possibility for additional information to be displayed regarding candidates and their policy positions in conjunction with the on-line vote. This would provide voters with basic information about the candidates and party platforms, and therefore better informing them to vote.

Drawbacks and Risks

Those opposed to, or skeptical of, electronic voting point to several drawbacks and perceived risks that are associated with types of Internet voting and telephone voting methods. The most prominently cited risk relates to **security**. Threats of computer viruses or hacker-orchestrated 'denial of service' attacks are most commonly mentioned as problems that could compromise an election and public confidence in electronic voting. This concern is most prevalent with regard to the security of personal computers. In light of this, the maintenance of **ballot secrecy** is presented as an issue when using computers that are unprotected, located in public places, or which may be susceptible to virus attacks. Other potential technical problems or issues include power outages or malfunctions in Internet connectivity as well as the possibility of servers shutting down or crashing. The reliable recording and storage of votes is also an important consideration.

Problems with **access** are raised. The material on remote Internet voting discusses the potential for a "digital divide", which can occur in two ways. There is a digital divide between those who have home computers with Internet connections and those who do not. Second, there may be a digital divide between those who have faster access and those who have slower connections and hence lower quality access. People with higher incomes are more likely to be able to afford access. Furthermore, access is often less expensive and of higher quality in urban areas. Those with lower incomes and who live in rural areas are at a disadvantage. Therefore, the extension of Internet voting has the potential to create divides with respect to many socio-economic variables, namely income, education, gender, geography and race and ethnicity. These potential divides could be problematic for participation and representation.

It is said that remote Internet and telephone voting present greater opportunity for **fraud** and **coercion** or vote-buying. Fraud occurs when someone votes on another's behalf without their permission, whereas coercion or vote-buying takes place when a voter is pressured by others to vote in a way that he or she would not have otherwise. Both present problems for ballot integrity since it is important that every vote cast be tallied as the voter intended. There is additional opportunity for fraud in electronic voting systems

if voter notification cards, which contain unique passwords required to cast a ballot, are intercepted. In the case of ballots not cast in person it is more challenging to verify a voter's identity. Remote voter authentication can be a problem since it may be difficult to confirm that the person voting is actually who he or she claims to be. While digital signatures and passwords can help, they are not foolproof and could potentially be shared.

The issue of **voter education** is cited as a concern. A lot of time and money must be invested to ensure that the public is aware that electronic voting is an option and that voters are able to understand and use the on-line system to cast a ballot. Without correct marketing and advertising it will be difficult to engage electors.

Privatization is a concern when electoral administrators cede control to a hired firm. Contracting elections out to private companies to run the electronic operations has negative implications for some people, and hence has the potential to negatively impact public confidence and trust in government and elections.

Finally, perhaps the most significant social concern is the threat of **disintegration of social capital** or civic life. The proliferation of electronic election services has the power, some say, to alter the nature of electoral participation by causing more electors to vote alone instead of at a polling place with others. This threatens to erode civic life, local social networks and groups related to elections.

BUDGET IMPLICATIONS

In 2020, our election costs totalled \$27,779. This included everything needed to administer the election, such as supplies, materials, polling station rentals and election workers. The only cost not tabulated would be time spent by other municipal staff on the election.

Based on our costs related to election workers and polling station rentals during the last election and the estimated cost of electronic voting (which is calculated on a per elector basis), using electronic voting would be practically cost neutral.

LEGAL IMPLICATIONS

Section 146A of the Municipal Elections Act bestows municipal councils with the legislative authority to select the method and system of voting.

PUBLIC CONSULTATION/COMMUNICATIONS

N/A

RECOMMENDATION

There is no doubt there are many benefits but still some drawbacks to the use of electronic voting. Those in favour of Internet and telephone voting argue that they provide improved levels of accessibility that can increase voter turnout and reach people who would not vote if required to attend a physical voting

site. By the very nature of services being offered, improved access to voting for many electors is an acknowledged benefit. Even with the recent successes observed in the municipal elections in Nova Scotia in 2012, 2016 and 2020, where a significant percentage of electors voted by phone or on the web, some saw increased voter turnout, but this was not the experience for all municipalities.

While most would agree that online voting is consistent with our increasingly online society, questions of how to maintain the security, validity, and integrity of our elections are still remain.

That being said, in 2020, 26 municipalities across the province offered Internet or telephone option to voters, compared to 20 in 2016. Electronic voting is becoming increasingly popular as the technology advances and improves. There are also different formats in which you can provide electronic voting to try and mitigate the drawbacks and risks. For example, some use it during advance polls only while others provide both paper and electronic voting methods.

In the end, the reality is that all electoral mechanisms carry a certain amount of risk. It is the responsibility of the Returning Officer to manage these risks as best they can. It is also incumbent upon electors not to engage in prohibited activity or corrupt practices respecting the vote.

The question is whether the risks of electronic voting are an acceptable trade-off for increased accessibility and convenience? Based on our research, the improved security and reliability of the systems and the growing use of electronic voting in our region, province and country, I would say the answer is yes. I therefore recommend that Council approve the use of electronic voting as a means of voting in our Municipality.

SUGGESTED MOTION

Move to recommend to Council to approve the use of electronic as a means of voting in the Municipality and direct staff to draft a by-law regulating its use.

ATTACHMENTS

- Section 146A of the Nova Scotia Municipal Elections Act
- 2020 AMANS Electronic Voting Presentation
- Online resources:
 - https://electionsnovascotia.ca/sites/default/files/2013_AR_appendix_InternetVoting.pdf
 - <https://www.municipalworld.com/feature-story/internet-voting/>
 - https://www.elections.ca/res/rec/tech/ivote/comp/ivote_e.pdf

(b) if no person is expressly required to administer it, then before the clerk, returning officer, registrar of voters, revising officer, deputy returning officer, a judge, barrister, notary public, justice of the peace or a commissioner for taking affidavits.

(2) The oath shall be administered without fee or reward. R.S., c. 300, s. 146.

Vote by mail or other voting method

146A (1) A council may by by-law authorize voters to vote by mail, electronically or by another voting method.

(2) The by-law referred to in subsection (1) shall provide for the system of voting for any election that occurs after the date stated in the by-law or the date the by-law takes effect, including

- (a) the notification of electors;
- (b) the form of the ballots where applicable;
- (c) the swearing in and voting on election day;
- (d) the method of counting the ballots or votes; and
- (e) the rejection of ballots or votes.

(3) The by-law may provide for

- (a) the contents of voters kits;
- (b) the places where voting can occur or ballots can be delivered instead of mailing, if applicable;
- (c) the process for sorting, storing or cataloguing any ballots received;
 - (ca) voting by telephone, via the Internet or by any other electronic means, including a combination of different electronic means;
 - (cb) the method of recounting the ballots or votes;
 - (cc) additional hours and dates for voting at an advance poll, including permitting voting twenty-four hours per day over a period of days;
 - (cd) the appointment and duties of an auditor to audit and monitor the performance of the system of voting;
 - (d) any matter or thing necessary to effectively conduct the election, including matters or things under Sections 75, 76, 77, 78, 79 and 86.

(3A) Where an auditor is appointed under the by-law, the auditor shall, before entering upon the duties of the office, take the oath in the form prescribed by the regulations.

(4) Not fewer than sixty days before ordinary polling day, the returning officer shall establish procedures and forms for the conduct of voting in accordance with the by-law and provide a copy of the procedures and forms to each candidate for election.

(5) Where a by-law under this Section is in effect, the provisions of this Act respecting the matters dealt with by the by-law apply only if the by-law so specifies.

(6) Notwithstanding subsection (5), where a by-law provides for voting via the Internet through the unsupervised use of a personal computing device, the by-law must also permit voting by some other means on each advance polling day and on ordinary polling day.

(7) A by-law made pursuant to this Section may provide for the creation of offences and may

(a) impose a fine not exceeding ten thousand dollars or imprisonment for a maximum term of two years less a day, or both;

(b) impose a minimum fine;

(c) provide for imprisonment, for not more than one year, for non-payment of a fine.

(8) The *Remission of Penalties Act* does not apply to a pecuniary penalty imposed under a by-law made pursuant to this Section.

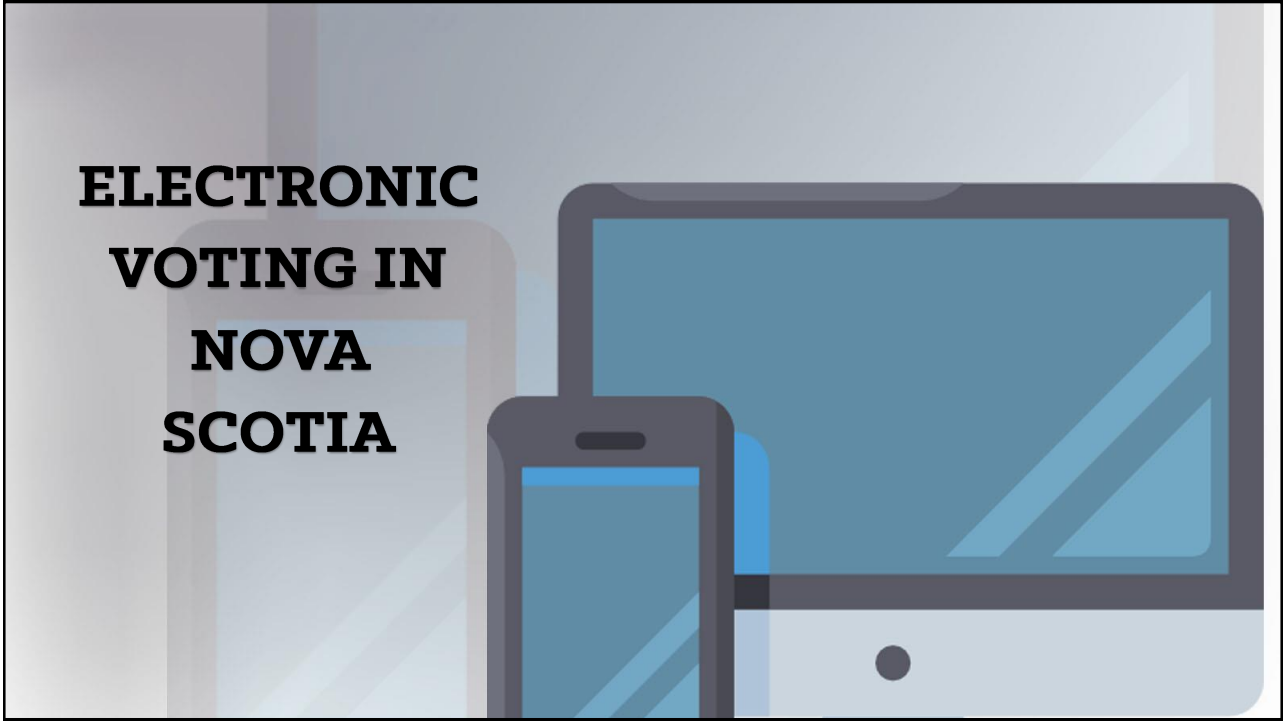
(9) The limitation period for the prosecution of an offence under a by-law made pursuant to this Section is two years from the later of the date of the commission of the offence and the date on which it was discovered that an offence had been committed. 2003, c. 9, s. 41; 2007, c. 46, s. 24; 2008, c. 24, s. 2; 2011, c. 68, s. 23; 2015, c. 47, s. 25.

Oath of councillor

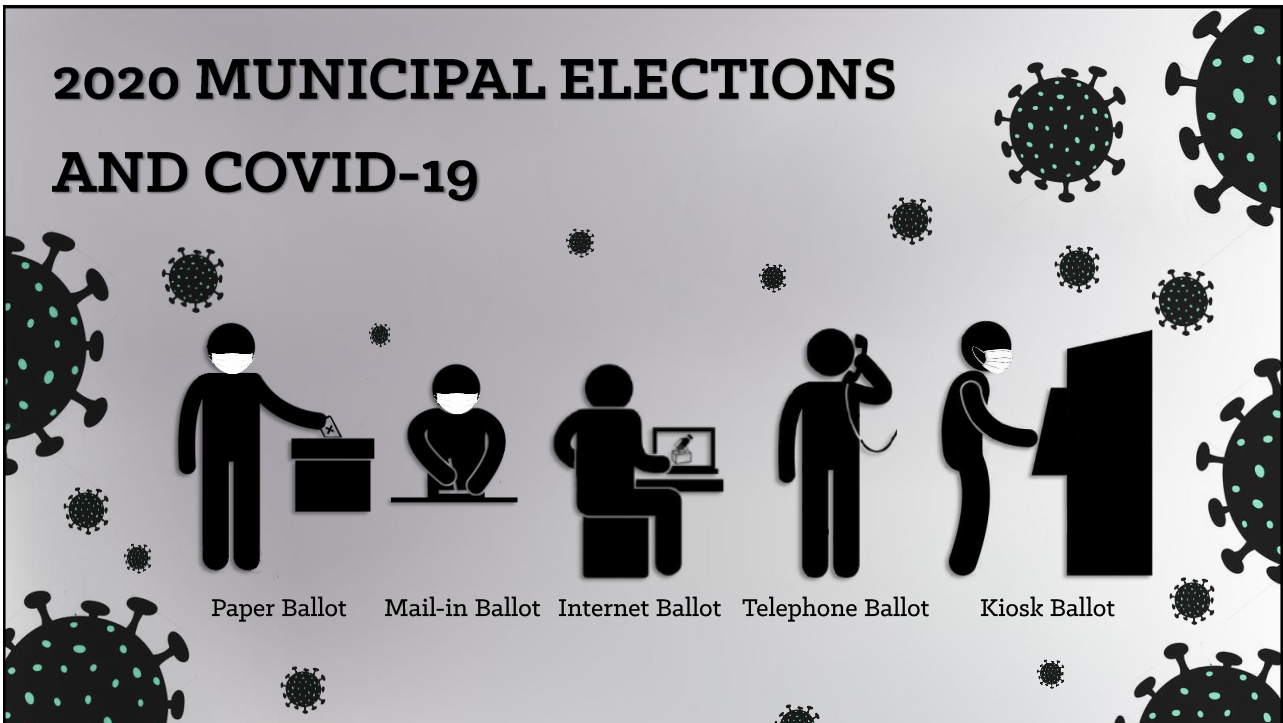
147 (1) A councillor shall, before entering upon the duties of his office, be sworn by taking the oath of allegiance and of office in prescribed form.

(2) The oath shall be administered by a judge, justice of the peace, the mayor or warden, or the clerk.

(3) The clerk shall enter a certificate of the taking of the oath in the minutes.



1



2

THE NOVA SCOTIA EXPERIENCE



3

HOW HAS E-VOTING BEEN IMPLEMENTED IN NS?

Municipalities with an Electronic Voting Option, 2016 Municipal and School Board Elections

	Municipality	Advance Vote	Election Day
1	Berwick	eVote	eVote
2	Digby (Town)	eVote	eVote
3	Middleton	eVote	eVote
4	Truro	eVote	eVote
5	Yarmouth (Town)	eVote	eVote
6	Antigonish	Paper, eVote	Paper, eVote
7	Argyle	Paper, eVote	Paper, eVote
8	Bridgewater	Paper, eVote	Paper, eVote
9	Clare	Paper, eVote	Paper, eVote
10	Digby (Mun)	Paper, eVote	Paper, eVote
11	Kentville	Paper (Sr. Fac.) eVote	Paper (Sr. Fac.) eVote
12	Shelburne (Town)	Paper (Sr. Fac.) eVote	Paper (Sr. Fac.) eVote
13	Stewiacke	Paper, eVote	Paper, eVote
14	Windsor	Paper (Sr. Fac.) eVote	Paper (Sr. Fac.) eVote
15	Cape Breton	eVote	Paper
16	Chester	eVote	Paper
17	Halifax Regional	Paper, eVote	Paper
18	Lunenburg (Mun)	eVote	Paper
19	New Glasgow	eVote	Paper
20	Pictou (Mun)	eVote	Paper
21	Pictou (Town)	eVote	Paper
22	Stellarton	eVote	Paper
23	Victoria	eVote	Paper

4

WHAT IS COUNCIL'S ROLE IN ELECTIONS?

- Authorize voters to vote by mail, electronically or by another voting method via By-Law
- Approve election budget
- Approve use of elector lists
- Appointing Returning Officer



5

THE REALITIES OF E-VOTING



6

E-VOTING IS ACCESSIBLE AND CONVENIENT

- Surveys of non-voters indicate that being too busy, out of town or ill/disabled is a reason that they did not vote.



7

E-VOTING IS POPULAR AMONG VOTERS

2008



2012



2016



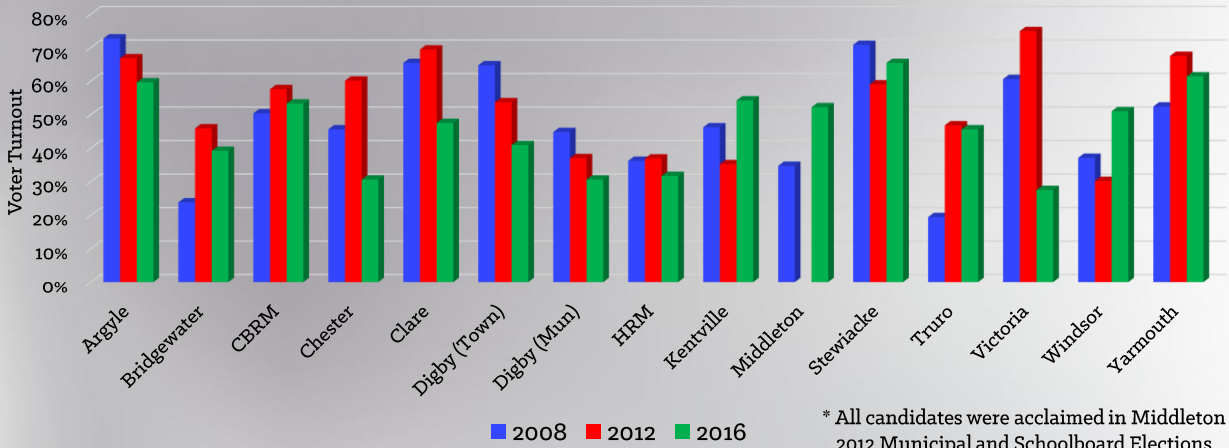
- Post-election surveys indicate that a voter who has cast an electronic ballot will **continue to vote electronically** in future elections.



8

E-VOTING IS NOT THE SOLE SOLUTION TO DECLINING TURNOUT

Voter Turnout, 2016, 2012 and 2008 Municipal and Schoolboard Elections



9

PERCEIVED VULNERABILITIES



10

INCREASED VOTER FRAUD

- Voter fraud is **extremely rare** in Canada. Almost all multiple voters suffer from some form of mental dementia, usually as a result of advanced age or substance abuse.



11

TECHNOLOGICAL THREATS

- “There has been **no evidence** of vote tampering or rigging in a **public election** using Internet voting”

(Elections BC, 2011: 27)



12

THE DIGITAL DIVIDE

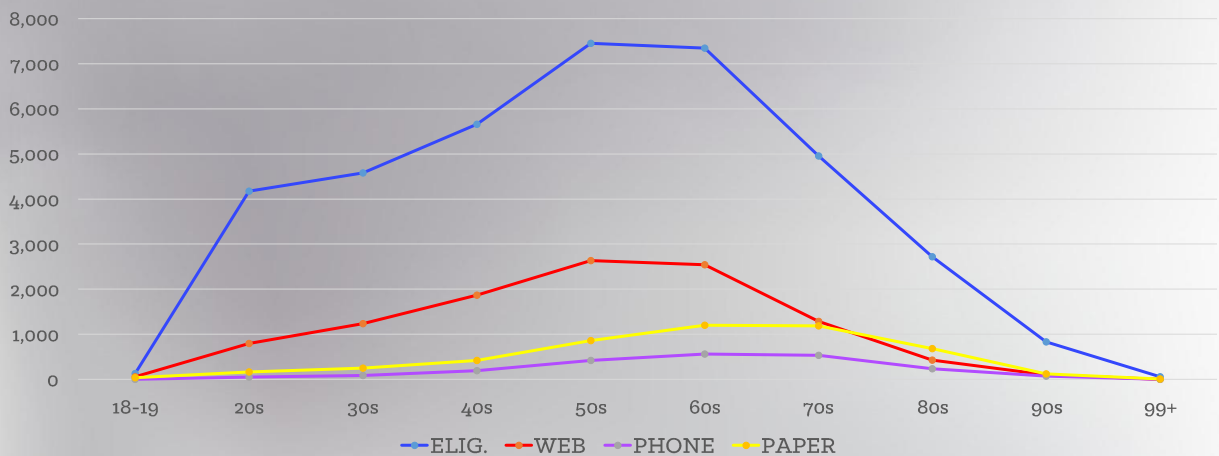
- The digital divide based on age, income and level of internet use is **narrowing** in Nova Scotia.



13

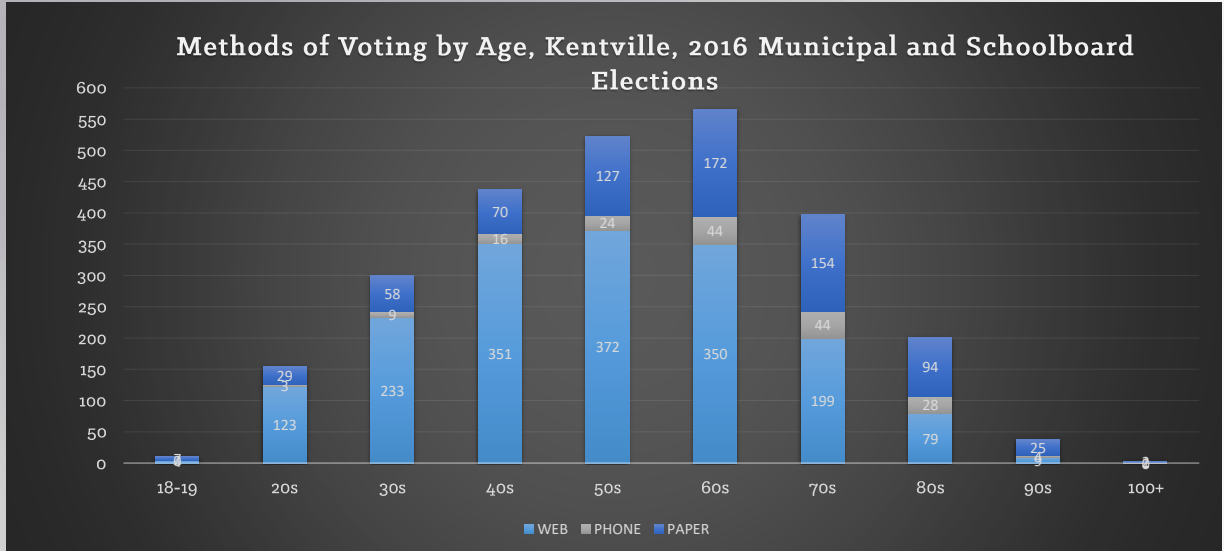
THE DIGITAL DIVIDE CONT.

Type of ballot cast, by age group, Antigonish Town, Argyle, Bridgewater, Clare, Digby Mun, Kentville, Shelburne Town, Stewiacke, and Windsor 2016 Municipal and Schoolboard elections



14

THE DIGITAL DIVIDE CONT.



15

DO THE RISKS OUTWIEGH THE BENEFITS?



- “No electoral mechanism (electronic or paper) can ever be **absolutely secure** from every possible offense or risk”.

(Elections Canada, 2013: 25)

16

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2024 Municipal & School Board Elections

Your 2024 eVoting supplier

*Project management coupled with established processes and procedures is delivered by a team of **experienced** information systems professionals and electronic elections experts, providing clients with the best in-class solution.*

Intelivote's consulting services assist election officials in all aspects of the election cycle.

PRE-ELECTION

Intelivote's team of election experts assist electoral administrators in the planning and configuration of eVoting elections including Elector List management, legislative compliance, and voting communication development.

Providing training and education to election personnel on all aspects of Internet and telephone voting ensures a successful voter experience and is included in Intelivote's base services.

Intelivote delivers expert guidance on remote voting assistance locations and paper voting integration with the eVoting experience.



ELECTION PERIOD

The eVoting period encompasses eVoting activity via Internet and telephone, candidate campaigning, and voter communication management provided by trained HelpLine agents, all facilitated by a suite of election tools and modules.

Voters can participate remotely or by using a Kiosk at a local voter assistance location.

Intelivote performs continuous monitoring of election progression, and election official modules provide on-demand reports available with real-time information.



POST-ELECTION

Following the eVoting period, electronic voting results are available within minutes. Election results are official and verified by third party auditors.

Access to a library of modules following the election allows for Elector List finalization and final reporting, practical for team debrief sessions and record keeping for future elections.

Election data is also translated into comprehensive election statistics by the Intelivote team to demonstrate various trends from the election activity.



Modules

Some of the many online module features we offer:

CEO

The CEO module allows election officials to observe vital information in the election as it progresses. Information on voter participation rates, and ballot level reporting can be delivered on a real-time basis.

Event Statistics	
Eligible Voters:	1,811
Total E-Votes:	210
Total Manual:	91
Participation Rate:	16.6%

Race Participation	Voted By WEB	Voted By PHONE
Mayor	114	33
District 1	69	20
District 2	45	13

Auditor

Authorized individuals acting in an audit role can validate critical components of the event while it is being conducted. Audit activities include verification that consistent and timely access was provided to voters and election officials during the event.



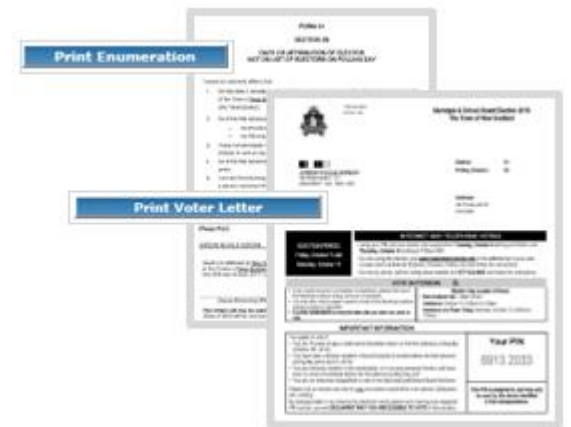
Voter Help

Voter assistance in a web-based solution allows the election support agents to assist voters with any question they might have in relation to their vote activity or eligibility.



Enumerator

Managing your List prior to an election during a revision period, or during the election itself, you can add eligible electors or verify voters in minutes with our easy-to-use voter information screen.



Candidate

Candidates can identify their supporters and ensure they have cast their ballots. Save time and energy that you can more effectively direct to your campaign.

ABBAS, HUSAM ADD <input type="checkbox"/> 332 ALBERT ST ANYTOWN, CA XS43LE	ABBAS, SHEILA ADD <input checked="" type="checkbox"/> 2446 ALDER ROAD ANYTOWN, CITY WSK9AS
ABBAS, JANICE ADD <input type="checkbox"/> 1941 GUMMOW COURT ANYTOWN, CITY F1K9AS	ACHESON, MILDRED ADD <input type="checkbox"/> 221 DEVON ST ANYTOWN, CA XS43AL

Services

Some of the many services we provide:

Project Management

Intelivote's consulting services delivered through the preparation and planning phases of the election cycle aid in ensuring the successful delivery of the eVoting experience to voters and admin alike.

Voter Data



Intelivote has partnered with Elections Nova Scotia (ENS) for over 15 years for list and data management. Ensuring that the information associated with each eligible elector is being properly managed, including updating information like name changes, address changes, or changes to Ward or District fields, is done through the various Intelivote modules (Voter Help or Enumerator) elections officials have access to.

For those municipalities that use ENS Data, any changes made during the revision period in the system will be uploaded to the Intelivote system, ensuring the most current data is available.

During the election any changes to any aspect of a voter profile, (deceased, address, or name change, etc.) is being logged in the system and once the election is over, the data is uploaded back to ENS ensuring that all the information that might have been impacted during the election, is successfully electronically updated by linking the Intelivote and ENS systems and securely updating the ENS version of the data to keep it current for future use.

Voter Communications



Intelivote has an integration process and relationship with partnered print-house Doculink that has been in place and successfully used for over ten years, producing Voter Instruction Letters for more than 3 million voters.

Municipal Elector List data that is used to create the Voter Instruction Letter for each eligible elector is uploaded to Doculink, and the letters are printed during a production schedule managed and coordinated by Intelivote ensuring they arrive by the scheduled date.

The eVoting Solution

Engagement

Increasing voter participation through multiple channel voting methods, and through interactive information sessions and voter education on Internet and Telephone voting.



Accessibility

Offering disabled persons the option to vote from any location and allowing the use of more than one method, translates through to an increase in the opportunity for disabled persons to vote without any assistance. This offers all voters the same level of independence and privacy.



Security

Intelivote delivers high-speed high-bandwidth data capability, and scalable IVR (telephone) port availability, further demonstrating the commitment to ensuring an election with maximum performance, communications path diversity, application redundancy and high survivability.



Election officials' mandate often includes containing election costs, but most importantly, managing administrative time/effort, and providing overall management for an election. These requirements are among the key objectives and benefits available through the implementation of Intelivote's eVoting solution.

Your 2024 eVoting supplier

Intelivote has delivered 113 Nova Scotia Municipal and Special Elections (by-elections) for Municipal clients, including:



Intelivote

has delivered thousands of electronic elections for many organizations such as municipal governments, Provincial and Federal government agencies, associations, political parties, and international unions.





TOWN OF CLARK'S HARBOUR

NOVA SCOTIA
(INCORPORATED MARCH 4TH, 1919)

November 16, 2023

RE: Wastewater Treatment Facility

Dear Warden Nickerson and Councillors:

As you may be aware, the Town of Clark's Harbour is pursuing the possibility of constructing a new wastewater treatment facility. The existing one, which was constructed in 1976 is nearly 50 years old and is definitely showing its age. Following an inspection by the NS Dept of Environment and Climate Change in December of 2021, there were many noted deficiencies, and this is when it was decided that mere "Band-Aids" would not solve problems ongoing for many years. There was a feasibility study completed by CBCL in June of 2022 and it indicated that a new facility would be the best choice. This new facility would only accommodate its existing customers or at the very least leave us with very little ability for growth.

Before making any concrete decisions, it was thought that the best practice would be to reach out to the Municipality of Barrington to inquire if there was any interest in sharing a facility in some compacity. One day, the Dept of Environment and Climate Change may come knocking on your door and indicate that a municipal sewer system is required for your residents of Cape Sable Island. Wouldn't it be nice if a facility already existed that could at least service the southern loop of CSI?

In the fall/winter of 22/23, both Councils decided on yet another feasibility study to determine if there was adequate land available to support a facility to service at least 1500 households and to determine potential costs. We are of the understanding that there is funding available for such a facility and that it is looked more favourably upon if two or more municipal units work together. We would like to get this project off the ground in a timely manner and we would be most appreciative of your support. I would like to add that Council voted for a 50/50 split of operations and capital if you should desire to join us on this endeavor.

Sincerely,

Jennifer Jones
Town Clerk/Treasurer




Town of Clark's Harbour Wastewater Feasibility Study

Final Report



230814.00 • July 2023

0	First Issue	<i>NM</i>	11-Jul-2023	<i>HS</i>
A	Draft	NM	20-Jun-2023	HS
Rev.	Issue	Reviewed By:	Date	Issued By:
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July 11, 2023

Ms. Jennifer Jones
Town Clerk
Town of Clark's Harbour
PO Box 160
Clark's Harbour, NS B0W 1P0

Dear Ms. Jones:

RE: *Town of Clark's Harbour Wastewater Treatment Plant Feasibility Study*

CBCL Limited is pleased to submit this report for your review, which presents the results of the wastewater treatment feasibility study completed for the Town of Clark's Harbour.

Yours very truly,

CBCL Limited



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Reviewed by:
Nick Moriarty, B.Eng.
Process Specialist

CC: Chris Frotten, Municipality of the District of Barrington

Project No.: 230814.00

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1 Background

The Town of Clark's Harbour (TCH) is located on the south shore of Cape Sable Island, Nova Scotia and has a population of 725 as reported by Statistics Canada in the 2021 TCH census. The TCH Wastewater Treatment Plant (WWTP) is located on Woodlands Street near the northern boundary of the town and was constructed in 1976 as part of a larger servicing project for the TCH. The serviced area contains residences, fish processing plants, a school, and several commercial establishments. Treated effluent from the plant is discharged to an ocean outfall that extends approximately 300 m into Clark's Harbour.

The existing WWTP utilizes an extended air activated sludge process and includes:

- ▶ A manually raked bar-screen.
- ▶ Aeration tank with mechanical aerator/mixer.
- ▶ Secondary clarifier.
- ▶ Sludge storage tank.
- ▶ Sludge drying beds (which are not currently used).
- ▶ Chlorine/de-chlorination contact chambers.

A system assessment of the TCH WWTP was completed by CBCL in July 2022. The resulting recommendation from the assessment was that the WWTP required significant upgrades to improve the treatment effectiveness and reliability, and to improve operator health and safety on site. Several options were provided as part of the system assessment which ranged from the base level improvements (minimum necessary works) to the more elaborate option, i.e., replacement of the WWTP with an alternative treatment process.

Following TCH Council and staff review of the assessment report, TCH concluded a replacement WWTP should be further investigated. Therefore, CBCL was retained by TCH in 2023, with the assistance of the Municipality of the District of Barrington (MoDB) under a Memorandum of Understanding, to perform a feasibility study to evaluate the potential for a replacement WWTP (new construction). To maximize the return on investment, the feasibility study will consider the incorporation of municipal flows generated from neighbouring communities.

1.1 Objectives

The objective of this study is to determine the maximum theoretical capacity of a new WWTP based on the flow capacity of the existing outfall pipeline (which is to remain in place), the available footprint at the existing site along with the TCH owned neighbouring lots, and the constraints of the current *Approval to Operate* (A.T.O). Following the determination of maximum theoretical capacity for the new WWTP, this study will then determine the feasibility, if any, of which additional communities could be included.

The general scope of work required to ensure the study meets its objective includes:

- ▶ Establishing design criteria and developing conceptual designs for an upgraded WWTP for the TCH.
- ▶ Assessing infrastructure requirements for expanding the WWTPs service area to neighbouring communities.
- ▶ Developing capital and operating cost estimates for upgraded facility and sewer network.

2 Wastewater Characteristics

2.1 Existing Flows & Loading

Historical flow data from January 2021 to December 2022, provided by the TCH, was reviewed to determine the Average Daily Flow (ADF), Peak Day Flow (PDF), Average Dry Weather Flow (ADWF), and the peaking factor (PDF:ADF ratio) currently experienced by the system.

The flow is measured by an overflow weir and level sensor. The readings were taken daily by the operations team, with the exception of weekends. Due to flow readings accumulating over the weekend, Monday readings are typically significantly higher than other daily readings therefore Monday readings were not included in the data analysis. Table 2.1 summarizes the existing flow parameters at the TCH WWTP.

Table 2.1: Existing Flow Parameters

Parameter	Value
Service Population (2021 Census)	725
ADF (m ³ /d)	230
ADWF (m ³ /d)	150
Per Capita Flow (m ³ /cap/d)	0.32
PDF (m ³ /d)	770
Peaking Factor (PDF: ADF)	3.4

Figure 2.1 shows a graph of the ADF for 2022 compared to the precipitation for the same period. For the most part, it can be noted that the precipitation does have an impact on the ADF, as both can be seen to peak together, or within a 24-hr period of each other. This indicates there is noticeable Inflow and Infiltration (I&I) occurring in the system.

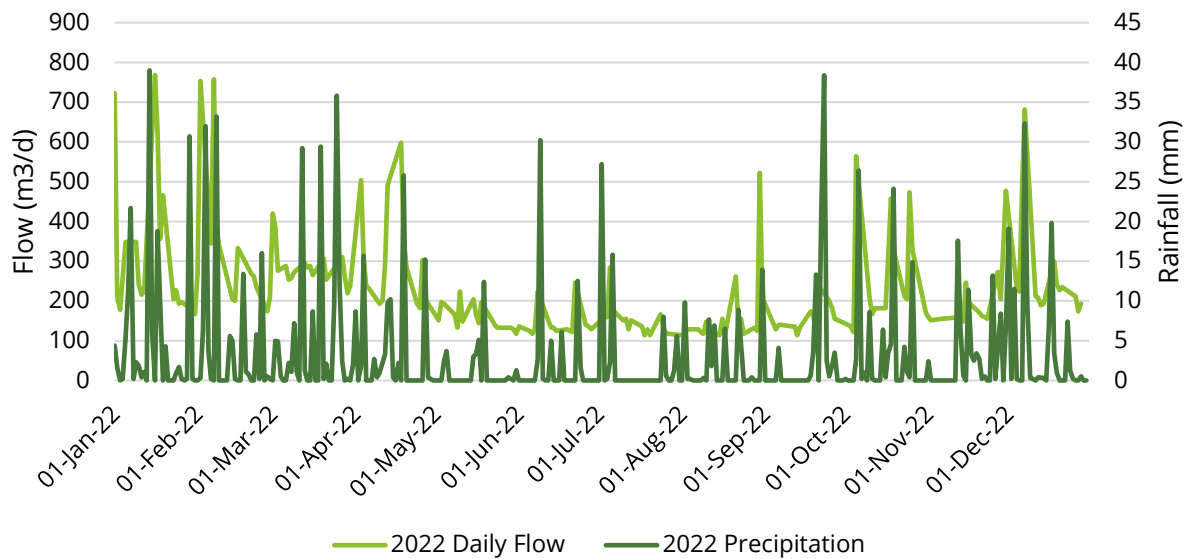


Figure 2.1 Average Daily Flow and Rainfall

The ADF was calculated to identify the contribution of sanitary sewer flows to the system without extraneous flows due to I&I. The ADF was defined as the average of flows that met the following criteria:

- ▶ Between the months of May and October.
- ▶ No rain within the previous 24 hours.
- ▶ No more than 5 mm of rain in the previous 48 hours.

As seen in Table 2.1, the ADF is 65% of the ADF therefore it is evident that I&I has a large impact on the calculated ADF.

Per capita flow was calculated by dividing the ADF by the serviced population. The flows are in line with the theoretical per capita flow rate of 0.34 m³/day listed in the Atlantic Canada Wastewater Systems Guidelines (ACWWA, 2022).

Wastewater loads are typically characterized by Carbonaceous Biochemical Oxygen Demand (cBOD), Total Suspended Solids (TSS), and Total Kjeldahl Nitrogen (TKN). The plant data collected by operators did not include influent data therefore theoretical per capita loading rates for cBOD, TSS and TKN were used to calculate influent loading conditions. The cBOD and TSS loadings of 0.08 kg and 0.09 kg per capita per day, respectively, were used from the Atlantic Canada Wastewater Guidelines Manual (ACWWA, 2022) to calculate cBOD and TSS influent loading. The theoretical TKN loading of 0.014 kg per capita per day was used from Metcalf and Eddy, Wastewater Engineering Treatment and Resource Recovery, 5th edition to calculate influent TKN loading. A summary of the assumed existing influent loading conditions is provided in Table 2.2.

Table 2.2: Existing Influent Loading Conditions

Parameter	Per Capita Load (kg/capita/day)	Average Load (kg/d)	Average Concentration (mg/L)
cBOD	0.08	58	253
TSS	0.09	65	285
TKN	0.014	10	44

2.2 Effluent Sampling

The original plant was designed to achieve secondary treatment standards which at the time of design were 30 mg/L for cBOD and TSS. Effluent disinfection was required to limit coliform density to 1000 MPN per 100 mL. The plant did not have an ammonia limit and was not designed to nitrify based on the design loading rates.

In 2015, the Federal Wastewater System Effluent Regulations (WSER) under the fisheries act set effluent cBOD and TSS limits of 25 mg/L as well as an un-ionized ammonia limit of 1.25 mg/L as NH₃-N.

In addition to WSER limits, the revised A.T.O, dated February 16, 2022, includes an *E. coli* limit of 200 MPN/100 mL and total residual chlorine (TRC) limit of 0.02 mg/L, as chlorine is used to disinfect the effluent prior to discharge.

Due to these changes in regulations, the effluent discharge requirements for which the new WWTP will be designed to meet are summarized in Table 2.3.

Table 2.3 Effluent Discharge Requirements

Parameter	Effluent Limit	Compliance	Required by
cBOD (mg/L)	25	Quarterly Average	WSER + A.T.O
TSS (mg/L)	25	Quarterly Average	WSER + A.T.O
Un-ionized Ammonia (as NH ₃ -N) (mg/L)	1.25	Upper Limit	WSER
Total Residual Chlorine (mg/L)	0.02	Upper Limit	A.T.O
<i>E. coli</i> (MPN/100mL)	200	Quarterly Geometric Mean	A.T.O

Effluent sample data from January 2021 to May 2022 are presented in Figure 2.2 and average values are summarized in Table 2.4.

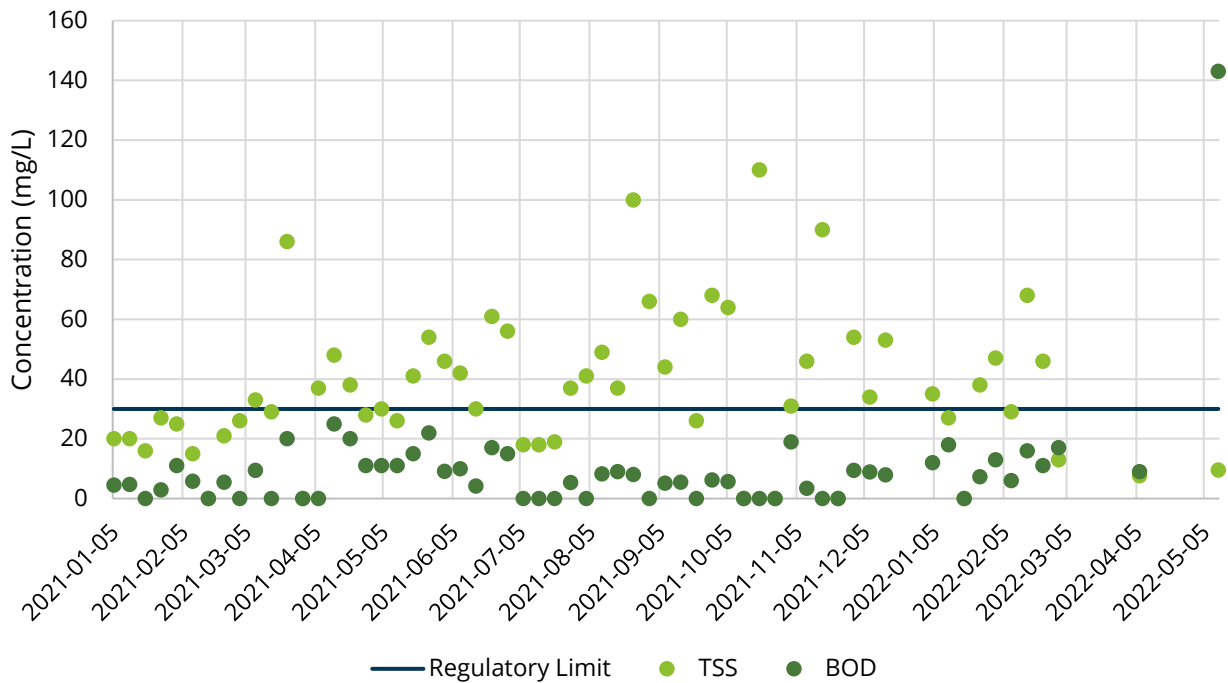


Figure 2.2: Effluent TSS and cBOD concentration

Table 2.4: Average Effluent Characteristics (2021 – 2022)

Parameter	2021	2022	Required Limits
cBOD (mg/L)	<9	14	25
TSS (mg/L)	41	41	25
Fecal Coliforms (MPN/100mL)	168	351	200

The current effluent data indicates that the plant is consistently meeting its cBOD limit however it periodically exceeds TSS and Fecal Coliforms. These excursions are typically due to high flows driven by precipitation events.

3 Additional Communities

The neighbouring communities that TCH would like to consider including in the WWTP, where economically viable, include:

- ▶ Lower Clark's Harbour.
- ▶ Newellton.
- ▶ West Head.
- ▶ Centerville.
- ▶ South Side.
- ▶ The Hawk.

Together with TCH, these communities form what is referred to as the Southern Loop of Cape Sable Island.

3.1 Additional Flows & Loads

MoDB provided current population data for the neighbouring areas that will be considered in this study. The theoretical per capita flow of 0.34 m³/day (ACWWA, 2022) was used to estimate additional flow to the system from neighbouring areas. A summary of populations from the neighbouring areas is provided in Table 3.1.

Table 3.1: Additional Community Populations

Community	Population
Lower Clark's Harbour	113
Newellton	252
West Head	50
Centerville	218
South Side	253
The Hawk	99
Total Additional Population	985

The additional communities considered would not include any industrial wastewater contributions to the sewer system and wastewater would predominately be from residential sources. Therefore, additional flow and load calculations are based on typical municipal wastewater compositions.

Although discussions with stakeholders indicated population growth is not expected in the area over the next 25 years, a low annual growth rate of 0.5% was used as a safety factor. The projected populations used for the design of the WWTP are summarized in Table 3.2.

Table 3.2: Projected 2048 Population; 0.5% Growth Per Annum

Parameter	2023 Population	Growth Population	2048 Population
Clark's Harbour	725	96	821
Additional Communities	985	131	1,116
Total Population	1,710	227	1,937

Based on a projected Southern Loop population of 1,937 in the design year of 2048, the following design criteria has been determined for the TCH WWTP (Table 3.3). ADF is based on the theoretical per capita flow of 0.34 m³/day which is in line with observed per capita flow rates currently experienced at the WWTP (0.32 m³/day). PDF was calculated using the existing peaking factor (PDF:ADF) observed at the plant of 3.4, based on flow data provided for 2022. Influent loadings were calculated using the per capita loading rates summarized in Table 2.2 and the total population as shown in Table 3.2.

Table 3.3: TCH WWTP 2048 Design Criteria

Parameter	Value	
ADF (m ³ /d)	660	
PDF (m ³ /d)	2,240	
	Concentration (mg/L)	Load (kg/d)
cBOD	253	167
TSS	285	188
TKN	44	30

3.2 Sewer System Upgrades

3.2.1 Existing TCH Sewer System

The TCH sewage collection system is a conventional gravity collection system. There are gravity sewers along the main roads leading to a total of seven (7) pump stations. These stations then feed the wastewater to Sewage Pump Station (SPS) #3, which pumps all wastewater up to the WWTP at a maximum flow rate of approximately 12 L/s. All existing pump stations in TCH have a maximum flow rate of approximately 12 L/s and any increase in flow through the collection system would require upgrades to all existing pump stations.

With the exception of TCH, the additional communities of the Southern Loop are currently serviced by on-site septic systems. It is reported by TCH that some of the systems are

failing or have failed due to the age of the infrastructure. All additional communities in the Southern Loop will require the installation of a sewer collection system with pumping arrangements where necessary to send sewage to the new TCH WWTP.

The portion of the Southern Loop to be included into the TCH WWTP is distributed along approximately 25 km of main road. The number of connections to the sewer main from the additional communities was estimated using the 2023 population of the additional communities (985 residents) and the people per dwelling based on the TCH 2021 census (approximately 2 residents per dwelling) (Statistics Canada, 2023). Based on these calculations, there are an estimated 500 additional residences that would be serviced by the proposed sewer system at the time of construction.

Below is an outline of two collection system options: a conventional gravity collection system or pressurized effluent sewer system. For both options, sewer lines were not accounted for through approximately a 1 km stretch along Bakers Flats on Centreville South Side Road. This area was identified by stakeholders as a low-lying marsh area that does not contain any residences or buildings therefore a sewer connection is not required, at this time.

3.2.2 Conventional Gravity Collection System

Conventional wastewater collection systems consist of sewers sloped to allow flow by gravity to a low point. Where necessary, the wastewater is conveyed to a pump station and pumped through a forcemain to a high point, which in turn flows via a gravity section to the next low point. This conveyance continues until the wastewater reaches the WWTP or SPS #3 in this case.

Gravity sewers are typically buried deep enough to accept ground floor or basement sewage by gravity (2 to 6 m deep) and pipes are no less than 200 mm in diameter. Buildings below the collection pipe must use a pump to discharge to the collection system. Newer sewer systems are generally separated systems, meaning the sewers only convey sanitary sewage to the WWTP to minimize extraneous flows due to storm events entering the WWTP.

Concrete manholes are used for maintenance and inspection access. Manholes are typically spaced 100 meters apart along the service main as well at all intersections and changes in pipe direction, size, and grade.

Regardless of method or quality of construction, conventional gravity collection systems have potential to experience I&I to some extent, increasing the hydraulic load to the treatment plant. In comparison to this, the pressurized effluent sewer system, as described below, should not suffer from I&I issues.

3.2.3 Pressurized Effluent Sewer System

In a pressurized effluent sewer system, wastewater from each residence discharges to an on-site effluent sewer tank (EST) which provides primary treatment (solids removal) prior to pumping filtered effluent to the sewer main leading to the WWTP.

Pressurized effluent sewer system laterals and mains consist of small diameter, low-pressure, shallow buried pipes, generally 1 to 2 m deep (below frost level) which is advantageous for rocky terrain, such as Cape Sable Island. Effluent sewer tanks allow for smaller sewer main diameters (50 mm to 100 mm) compared to a conventional gravity collection system (100 mm to 200 mm) as the majority of solids remain in the tank and only the liquid portion is pumped to the sewer main.

The pressurized sewer mains follow the ground profile and are typically PVC or HDPE pipe. Pressurized effluent sewer systems do not require the installation of manholes or satellite pump stations to carry sewage to the WWTP or SPS #3 in this case. Maintenance access is possible at the residential pump chamber or at cleanouts provided in the main.

3.2.4 Options for Sewage Collection Network

3.2.4.1 Option 1: Conventional Gravity Collection System

Based on preliminary mapping of the Southern Loop's topography, a gravity sewer main with several satellite pump stations leading to sections of forcemain will be required to transmit wastewater to the new TCH WWTP. A map of the proposed gravity sewer main and pump stations is provided in Appendix A.

For this option, flows from South Side, Lower Clark's Harbour and The Hawk would tie into the existing collection system in TCH at SPS #7 while flows from Centreville, Newellton, and West Head would tie into the existing system at SPS #2. Extending the existing TCH collection system to the neighbouring communities would require upgrading all existing pump stations to handle the increase in flow.

Preliminary details of the conventional collection sewer system proposed to service all Southern Loop communities include:

- ▶ Approximately 20 km of 200 mm gravity sewer.
- ▶ Approximately 11 km of 100 mm sewer forcemain.
- ▶ 15 satellite duplex pump stations.
- ▶ Approximately 518 additional serviced residences.
- ▶ Approximately 200 manholes.
- ▶ All 7 existing pump stations in TCH require upgrading to handle increased flow.
- ▶ Buildings below the elevation of the collection sewers will require pumping.

3.2.4.2 Option 2: Pressurized Effluent Sewer System

Currently, all residences under consideration to be added to the TCH sewer system are serviced by on-site systems (septic tanks). As indicated by stakeholders, some of these on-site systems are nearing the end of their lifecycle. Therefore, the proposed solution is to replace all old/failing on-site systems with ESTs designed for pressurized sewer systems. Residents who recently replaced their septic tank would be able to connect to the system in the future once their septic tank has reached the end of its lifecycle.

Discussions with suppliers indicated that it is possible for existing septic tanks to be retrofitted with an effluent filter and pump rather than installing an EST, provided the existing septic tank meets several requirements and quality standards. However, this method is not recommended as conventional septic tanks are not designed to meet the same level of solids removal as ESTs and therefore could cause operational problems leading to more frequent collection system maintenance.

Since solids are retained within the tank, regular maintenance of the EST is required, on average every five years. As all ESTs are connected to the WWTP collection system, servicing/cleaning of the tanks would be the responsibility of the municipality.

The municipality would also be responsible for the installation of the individual systems and connection to the main pressure sewer. Installation cost on private property is therefore the responsibility of the municipality. To somewhat counterbalance this cost, there is typically a nominal “connection fee” for connecting each dwelling to the network.

A map of the proposed pressurized effluent sewer system is provided in Appendix A however the pump stations noted on the map would not be required for this option. A pressurized effluent sewer main would be installed alongside the existing collection system throughout TCH until SPS #3, after which all flow would be sent to the WWTP. Therefore, for this option, only SPS #3 would require upgrading to handle the increased flow and the existing collection system in TCH would not be upgraded or altered.

Based on preliminary mapping of the area, details of the pressurized effluent sewer system proposed to service all Southern Loop communities include:

- ▶ Approximately 23 km of 80 mm pressure sewer.
- ▶ Installation of approximately 518 effluent sewer tank systems (one at each residence).
- ▶ Required upgrade of SPS #3.
- ▶ Manholes and satellite pump stations are not required, however clean-outs may be required and located where necessary.
- ▶ Effluent sewer tank maintenance/clean-outs approximately every 5 years.

3.3 Collection System Construction Methodology

Installing the sewer main will require trench excavations running alongside main roads (SK01) with the depth of trench dependent on the sewer system selected (2 to 6 meters for gravity sewer, 1 to 2 meters for pressurized effluent sewer). Other construction works include pipe installation, and site/road works such as backfilling, bedding, asphaltting, and grading.

Service laterals from the main sewer will connect individual residences to the collection system. For the conventional gravity collection system, connecting households to the main would require trenching on each property to install lateral piping connections from the house to the main. Following installation, the trenches will require backfilling, bedding, and grading. Houses below grade will also require the installation of a pump to discharge wastewater from the residence to the main.

Connections from individual residences with a pressurized effluent sewer system would require an excavation of 2.5 m diameter by a minimum of 1.5 m deep to install the EST below grade as well as 1 to 2 m deep trenches to install piping connections (house to tank, tank to main). Depth of the EST excavation would be dependent upon the position of the gravity line from the residence relative to grade. The EST would require a reinforced concrete slab and ballast backfill to hold the tank in place. The site would require backfilling, bedding, and grading following piping and equipment installation on the property. The works would also require de-commissioning and possible removal of the existing septic tank system.

Due to the span of the proposed sewer network, its construction and installation is anticipated to be carried out modularly over 5 years. As shown in SK02 (Appendix B), the proposed sewer network area has been subdivided into the following three zones for buildout:

- ▶ Zone 1: Lower Clark's Harbour and South Side.
- ▶ Zone 2: The Hawk.
- ▶ Zone 3: West Head, Newellton, and Centreville.

Zones 1 and 2 combined contain approximately the same population and estimated number of dwellings as in Zone 3 therefore, the proposed construction methodology is to initially service "half" of the Southern Loop followed by the remaining "half" at a later date. Initially servicing half of the Southern Loop could be achieved by installing sewer mains in Zones 1 and 2 prior to Zone 3. Alternatively, Zone 3 could be serviced prior to Zones 1 and 2. It is important to note that due to the location of Zone 2, a portion of Zone 1 is required in order to convey Zone 2 sewage to the WWTP therefore, Zone 2 would be built in conjunction with or following Zone 1.

4 TCH WWTP Upgrade

Based on results of the system assessment in 2022, a replacement WWTP was recommended for the TCH which included the construction of two (2) Sequencing Batch Reactor (SBR) tanks and potentially using the existing aeration tank as an influent equalization tank. The proposed WWTP in the system assessment report was based on the current service population of the existing WWTP. Given that TCH would like to expand the service area to include as many additional communities as possible, the maximum achievable capacity of the replacement WWTP needed to be determined.

4.1 Design Capacity

As TCH would like the replacement WWTP to use the existing outfall pipeline, to avoid regulatory complexities, the treatment plant capacity will be limited by the following:

- ▶ Flow capacity of the existing outfall pipeline.
- ▶ Available footprint for building the WWTP.
- ▶ Effluent requirements of the current A.T.O.

Effluent from the existing WWTP flows by gravity to Manhole 70 (MH70) on Woodlands Street and continues by gravity to the outfall, which extends approximately 300 m into Clark's Harbour. The outfall consists of 200 mm P.V.C and ductile iron piping. Using appropriate design conditions, the hydraulic capacity of the outfall was calculated at 40 L/s.

Two lots neighbouring the site of the existing WWTP were identified by TCH for the construction of the new WWTP (Appendix C). Discussions with stakeholders indicated the neighbouring lots are south-west of the existing site and run along Woodland Street. By utilizing the two identified lots, there would be an additional 1,693 m² (lot 1 = 968 m², lot 2 = 725 m²) of space available to build the new WWTP. However, this would require significant site works to prepare the area for construction and stakeholders indicated keeping the WWTP within the footprint of the existing 4,573 m² site would be preferred.

4.2 Site Layout

Following discussions with manufacturers, it is estimated the new WWTP could fit within the 4,573 m² lot on which the existing WWTP currently sits and therefore will likely not require the two available lots adjacent to the site for construction. The preliminary proposed layout of the new WWTP is provided in Appendix D (SK04).

As depicted by the piping in SK04, raw influent will enter the WWTP through the existing forcemain where it will be sent to the headworks portion of the process building for preliminary screening. Screened wastewater will then flow by gravity to the pump station retrofitted from the existing aeration tank. Wastewater will be continuously pumped to one of the SBR tanks via the pump station.

Following treatment in the SBR, treated effluent will flow by gravity to the UV disinfection process room in the process building. Following disinfection, the effluent will be discharged by gravity to Clark's Harbour via the existing outfall pipeline. Wasted sludge will be pumped from the SBR basins via submersible pumps during the settle/idle phase and be sent to the aerated sludge holding tank where it will be stored until collection.

4.3 WWTP Upgrade Details

The proposed replacement WWTP would include the construction of two SBR tanks and a new process building which would house the headworks screen, blowers, controls, and disinfection equipment. The existing aeration tank would be retrofitted to operate as a sludge storage tank, to store sludge until collection, and a pump station to pump screened influent wastewater to the SBR tanks.

4.3.1 Preliminary Treatment & Process Building

The proposed WWTP will include the construction of a new process building to house the equipment and protect it from wear and tear and extend equipment life. As shown in SK04, the process building will be separated into three rooms, one room for each of the following processes:

- ▶ Headworks (preliminary screening).
- ▶ Blowers and controls.
- ▶ Disinfection.

The building will be 10 by 14 m, with a wood frame and steel siding or split-faced block on a new concrete foundation. The process room of the building will be a confined space and the building will be considered a classified area based on the nature of the building and will be equipped with an HVAC system.

As shown in SK04, blowers and controls will be housed within the new process building. Blowers will be used to supply air to the WWTP processes, and the controls will be connected to a Supervisory Control and Data (SCADA) system to allow operators to view the status of all equipment at the WWTP.

Raw influent wastewater will be supplied to the treatment facility via an upgraded lift station (SPS #3) and existing forcemain. A new shaftless spiral fine screen with 6 mm perforations will be installed in the headworks (screen) room within the process building to improve upfront solids capture and removal of large debris and rags that contribute to

additional maintenance in the WWTP. The system will be equipped with an endless bag for improved odour control. The screen room will be hazardous rated as the process handles raw sewage.

4.3.2 Sequencing Batch Reactor

Screened influent from the headworks room will be sent by gravity to a pump station (retrofitted from the existing aeration tank) which will continuously pump flow to one of the SBR tanks for biological treatment (SK04).

Biological treatment, the main treatment component of the plant, will be provided by SBR technology. An SBR process is an aerobic suspended growth biological treatment process which provides the same unit processes as a conventional activated sludge system (aeration and sedimentation). In a conventional activated sludge system, these processes take place in separate tanks whereas with an SBR, the processes are carried out sequentially in the same tank.

The SBR is a fill-and-draw activated sludge system. All SBR systems have five steps in common, which are carried out in sequence as follows:

- ▶ Fill – Pre-screened wastewater fed to the reactor.
- ▶ React – Mixing and aeration.
- ▶ Settle – Sedimentation/clarification.
- ▶ Decant – Withdrawal of treated wastewater from the reactor.
- ▶ Idle – Removal of waste sludge from the reactor.

During the react phase, microorganisms contact the organic matter (cBOD) in the wastewater and a large amount of oxygen is provided by aerators within the tank to facilitate biodegradation of the organic matter and nitrogen. Aeration is discontinued at the settling phase, which allows suspended solids to settle to the bottom, leaving a clear treated effluent above a settled sludge blanket. The treated effluent is then withdrawn from the tank by an automated, time-controlled decant mechanism. Following the decant phase, an idle phase occurs between cycles during which sludge wasting can occur.

Sludge wasting plays an important role in overall treatment performance and maintains the Food-to-Microorganism (F:M) ratio within the reactors. A submersible Wasted Activated Sludge (WAS) pump will be installed in each reactor basin which will send WAS to an aerated sludge holding tank retrofitted from the existing aeration tank. Following a period of settling in the holding tank, supernatant liquid on top of the settled sludge will be pumped back to the SBR basins via the pump station.

A two-reactor system, each with decanter mechanisms, is proposed for this installation. The tanks will be constructed of cast-in-place concrete. The configuration is typically operated with one reactor in the react phase while the second reactor is in the settling and decant phases. This allows for one blower to aerate both reactors and spreads out the

decant periods so there is no overlap which would result in a higher flowrate through the disinfection system and outfall.

The SBR will typically operate based on a 4-hour cycle during average flow, resulting in 6 batches per day, per tank. SBRs are ideal for effectively handling large variations in flow through operating/programming adjustments. For example, during periods of peak flows, the idle cycle can be reduced or eliminated leading to more cycles per day with the same batch size. Conversely, during periods of low flow, the fill phase will be extended and result in fewer batches treated per day. This method of operating allows tankage which has been sized based on average flow rates to treat peak flow rates by altering cycle times as opposed to requiring additional tankage. Operation of the SBR will be controlled by a PLC operating on timer control with a level override.

The reactors will be equipped with fine bubble diffusers for aeration and mixing. Two positive displacement rotary lobe blowers (one duty and one standby) will be located inside the blowers and controls room within the process building (SK04). The blowers will provide the required airflow per reactor to support the biological degradation of wastewater within the SBR basin. The airflow rate will be automatically controlled by feedback from a Dissolved Oxygen (DO) probe in each SBR basin.

4.3.3 Disinfection

Treated effluent decanted from the SBR tanks will flow by gravity to the disinfection room within the new process building (SK04). Disinfection of the secondary effluent prior to discharge will be by Ultraviolet (UV) light technology to provide rapid and effective inactivation of microorganisms. UV systems are installed in either stainless steel or concrete channels with UV lamps oriented horizontally, parallel to the direction of flow.

UV disinfection is a physical disinfection process rather than a chemical process, such as chlorination, which is currently used at the WWTP. Utilizing UV disinfection technology eliminates the need to purchase, transport, store, and handle chemicals on an ongoing basis and would eliminate the TRC effluent discharge requirement for the WWTP.

Following UV disinfection, the effluent will discharge to Clark's Harbour by gravity through the existing outfall pipeline (SK04). The UV disinfection system will be sized appropriately to handle the peak flowrate capacity of 40 L/s.

4.3.4 Sludge Storage & Disposal

Half of the existing aeration tank will be repurposed to store WAS from the SBR tanks. By dividing the existing 427 m³ tank in half, there will be sufficient volume to provide storage capacity for 30 days prior to disposal by trucking off-site. WAS will be transferred to the aerated sludge holding tank by submersible pumps located within the reactor tanks (SK04).

The existing aerator will be decommissioned and removed from the aeration tank. A cast-in-place concrete partition will be installed to separate the aerated sludge holding tank from the pump station. The aerated sludge holding tank will be equipped with new coarse bubble diffusers for aeration with a dedicated positive-displacement blower located in the blower room providing the required airflow.

4.4 WWTP Construction Methodology

Based on the results of the WWTP System Assessment in 2022, upgrades/replacement of the existing WWTP is a priority in order to meet final effluent discharge requirements and provide operators with a safe place to work. Construction of the WWTP is proposed prior to the construction of the sewer collection system which as previously mentioned could be carried out modularly over 5 years. Therefore, the WWTP buildout options are as follows:

- ▶ Buildout A: To treat only the TCH area (i.e., current flows and loads)
- ▶ Buildout B1: TCH + ½ Southern Loop (Zones 1 & 2 or Zone 3)
- ▶ Buildout C: Full Southern Loop (TCH, Zones 1, 2, & 3)
- ▶ Buildout B2: Buildout B1 + SBR tankage added once remainder of Southern Loop is serviced at a later date.

Buildouts A, B, and C would result in the construction of 2 SBR tanks of varying dimensions. As the WWTP would be constructed prior to the addition of neighbouring communities, the WWTP would initially operate with similar flows currently experienced at the plant (ADF = 230 m³/d). As previously noted, an SBR system is ideal for handling large variations in flows and initial operation would treat current TCH influent flows using one SBR train while the second train remains offline. Once the sewer system has been installed to service additional communities thereby increasing flow to the plant, the second reactor train can be brought online, and the plant will operate both SBR trains cyclically in parallel. Tankage for Buildout C would have a slightly larger footprint (5 x 16.5 m) than those for Buildouts A and B (5 x 12 m) in order to adequately handle flows.

Buildout B2 is an addition to Buildout B 1 whereby the WWTP would initially be built to service TCH and half of the Southern Loop. For this buildout, one (1) additional SBR tank (5 x 12 m) would be added to the WWTP once the remaining half of the Southern Loop is serviced by the selected sewer system (SK04). The addition of the SBR tank would not require significant upgrades to other process at the WWTP (headworks, aeration, disinfection, etc.) as future flows and loading would be taken into consideration during initial design.

The construction methodology for the new WWTP will require careful forethought and planning. The ideal construction of the new WWTP would minimize interruption to the existing treatment plant. Construction of the two SBR tanks and new process building could be achieved without disrupting the current operation of the existing treatment plant. However, operational modifications would be required while the existing aeration tank is retrofitted to a sludge holding tank and pump station. Ideally, the SBR could operate with

modified pumping arrangements to provide biological treatment of the wastewater while the existing aeration tank is retrofitted.

The existing clarifier will be decommissioned and infilled with a concrete slab. The space can be repurposed as additional storage and/or lab space for the operators. The existing control building will remain in place and be used as an office for operators.

Design and construction of this project is anticipated to be completed over a 5-year period. The estimated timeline for completing the proposed TCH WWTP and sewer collection system is summarized in Table 4.1.

Table 4.1: Estimated Project Timeline

Time	Task
Fall/Winter 2023	Preliminary and detail design of WWTP
Spring 2024	Tender to WWTP
Spring/Summer 2024	Preliminary and detail design of sewer collection system
Summer 2024 – Spring 2025	Construction of WWTP
Fall 2024	Tender of sewer collection system
Spring 2025 – Winter 2026*	Construction of sewer collection system
Fall 2025 – 2027*	Connection of initial homes
Post 2027*	Connection of remaining homes

*Timing dependent on sewer collection system option

5 Cost Assessment

Capital and operating costs have been developed for the proposed WWTP upgrades presented in Chapter 4 and both collection system options presented in Chapter 3. Equipment sizing and associated costs may be reduced if fewer additional communities are connected to the system.

5.1 Capital Costs

Opinions of Probable Capital Cost for the collection system expansion and new WWTP are provided in Appendix E and summarized in Table 5.1. These estimates include allowances for engineering, unforeseen changes during design and construction (i.e., contingencies) as well as the consideration for remote location (i.e., Cape Sable Island).

Table 5.1 Opinion of Probable Cost for WWTP Plant Upgrade & Collection System Expansion

Zone	Parameter	Option #1 Conventional Gravity Sewer	Option #2 Pressurized Effluent Sewer
1	Sewer System Capital Cost	\$18,693,250	\$16,469,265
	Design Development Contingency (25%)	\$4,673,313	\$4,117,316
	Escalation/Inflation Contingency (0%)*	-	-
	Location Factor (1.2)	\$3,738,650	\$3,293,853
	Construction Contingency (25%)	\$4,673,313	\$4,117,316
	Zone 1 Subtotal	\$31,778,525	\$27,997,751
2	Sewer System Capital Cost	\$8,625,000	\$6,415,620
	Design Development Contingency (25%)	\$2,156,250	\$1,603,905
	Escalation/Inflation Contingency (0%)*	-	-
	Location Factor (1.2)	\$1,725,000	\$1,283,124
	Construction Contingency (25%)	\$2,156,250	\$1,603,905
	Zone 2 Subtotal	\$14,662,500	\$10,906,554
3	Sewer System Capital Cost	\$21,131,250	\$16,941,225
	Design Development Contingency (25%)	\$5,282,813	\$4,235,306
	Escalation/Inflation Contingency (0%)*	-	-
	Location Factor (1.2)	\$4,226,250	\$3,388,245

	Construction Contingency (25%)	\$5,282,813	\$4,235,306
	Zone 3 Subtotal	\$35,923,125	\$28,800,083
	Full Collection System Capital Cost	\$82,364,150	\$67,704,387
	Wastewater Treatment Plant Capital Cost**	\$3,317,304	\$3,317,304
	Design Development Contingency (25%)	\$829,326	\$829,326
	Escalation/Inflation Contingency (0%)*	-	-
	Location Factor (1.2)	\$663,461	\$663,461
	Construction Contingency (25%)	\$829,326	\$829,326
	WWTP Subtotal	\$5,639,417	\$5,639,417
	Total Direct & Indirect Construction Costs	\$88,003,570	\$73,343,810

*Costing is based on 2023 dollars. Due to uncertainty of the markets, we are unable to estimate an inflation percentage over the next four years.

**WWTP Capital Costs based on initial build of WWTP to service Full Southern Loop (Buildout C).

Although the WWTP capital cost provided in Table 5.1 is based on the buildout of a treatment plant that will be able to service TCH and the full Southern Loop, other buildout options were considered. The Opinions of Probable Capital Cost for each WWTP buildout option considered are summarized in Table 5.2.

Table 5.2: Opinion of Probable Cost for WWTP Buildout Options

Parameter	Buildout A	Buildout B1	Buildout C	Buildout B2
	TCH	TCH + ½ Southern Loop	Full Southern Loop	Buildout B1 + Following ½ SL
Mobilization, Bonds, Insurance & Pre-construction management	\$131,360	\$138,743	\$157,967	\$47,538
Civil Work	\$150,800	\$158,000	\$162,000	\$40,000
Demolition	\$26,100	\$26,100	\$26,100	-
Reinforced Concrete	\$108,800	\$122,400	\$136,000	\$85,000
Masonry and Walls	\$40,000	\$40,000	\$40,000	-
Roof Structure and Roofing	\$65,000	\$65,000	\$65,000	-
Miscellaneous Metals	\$33,000	\$33,000	\$33,000	\$15,000
Interior/Exterior Building Finish	\$51,000	\$51,000	\$51,000	-
Process Equipment	\$1,127,200	\$1,197,650	\$1,409,000	\$350,000
Valves and Piping	\$103,700	\$109,800	\$122,000	\$62,000
Process Integration (instrumentation & control)	\$102,400	\$108,800	\$128,000	\$59,750

HVAC	\$82,000	\$82,000	\$82,000	-
Electrical	\$394,520	\$419,178	\$493,150	\$215,000
General Contractor Overheads and Profit, Fees (15%)	\$342,678	\$361,939	\$412,088	\$124,013
Total Direct & Indirect Costs (excluding contingencies)	\$2,758,558	\$2,913,610	\$3,317,304	\$998,301
Contingency & Allowances				
Design Development contingency (25%)	\$689,639	\$728,402	\$829,326	\$249,575
Escalation/Inflation (0%)*	-	-	-	-
Location Factor (1.2)	\$551,712	\$582,772	\$663,461	\$199,660
Construction Contingency (25%)	\$689,639	\$728,402	\$829,326	\$249,575
Total Construction Costs without HST	\$4,690,000	\$4,954,000	\$5,640,000	\$1,698,000**

*Costing is based on 2023 dollars. Due to uncertainty of the markets, we are unable to estimate an inflation percentage over the next four years.

**Cost of Buildout B2 is in addition to costs associated with Buildout B1.

Capital cost estimates in Table 5.1 and Table 5.2 include contingency and engineering but do not include taxes. The opinion of probable costs presented are based on CBCL’s experience, qualifications and best judgment and are an order of magnitude estimate used for evaluation purposes. For a more detailed cost estimate a concept design would be required. CBCL cannot warrant or guarantee that actual costs will not vary from the opinion provided.

5.2 Operating Costs

Estimated annual operating costs for the proposed WWTP and collection system options are provided in Table 5.3. Operating costs were developed for the equipment based on experience and operations of similar systems/facilities, coupled with details from equipment suppliers.

Table 5.3: Operating Cost Estimates

System	Annual Operating Cost Estimate
Wastewater Treatment Plant*	\$107,000
Conventional Gravity Sewer	\$43,500
Pressurized Effluent Sewer	\$55,038

*WWTP Operating Costs based on initial build of WWTP to service Full Southern Loop (Buildout C).

The annual operating cost estimate for the WWTP includes heat & power, electricity, sludge management/disposal and a maintenance allowance. The annual operating cost estimates for the collection systems are based on maintenance allowance for the system.

The following assumptions were utilized in developing the operating cost information:

- ▶ Electricity costs are estimated at \$0.15/kWh.
- ▶ Annual WWTP Maintenance Costs are assumed to be 2% of equipment costs.
- ▶ Annual Maintenance Costs for the gravity sewer are assumed to be \$110/per 100 m of sewer and \$200 per manhole.
- ▶ Annual Maintenance Costs for the pressurized effluent sewer system are assumed to be \$850 per EST clean-out.
- ▶ EST clean-out on average every 5 years; 2.5 cleanings/EST over 20 years; 518 ESTs.

5.3 Net Present Value

Discounted present value calculations were carried out to estimate the Net Present Value (NPV) of the two proposed sewer collection system options. This is the standard method for calculating the relative costs of different options. NPV is calculated using Equation 5.1, where “Cost in period n” is the net cost in a given year, “n” is the year from 1 to 20, and “rate” is the real discount rate. This cost is calculated for each year in question and the yearly costs are summed.

Equation 5.1: Net Present Value

$$NPV = \sum \frac{\text{Cost in period } n}{(1 + \text{rate})^n}$$

The effect of this calculation is that costs which occur soon are weighted more heavily than costs which occur further down the road, based on the idea that a dollar today is worth more than a (more uncertain) dollar in the future. The calculations in the report were carried out without applying an assumed inflation rate. This is called a real NPV. If inflation is used (called nominal NPV), it is applied to both the costs (which are higher by inflations) and the discount rate (nominal discount rate equals real discount rate plus inflation, therefore higher) so that the higher costs are discounted faster, and the two effects cancel each other out, giving the same result whether the real or nominal NPV is calculated. The real discount rate used in these calculations is 8% and the time period over which it is calculated is 20 years, starting in 2023.

The life cycle cost comparison of the options considered is provided in Table 5.4. The NPV for the WWTP was not included/considered at this time as the SBR would be common to both options. This analysis is provided to demonstrate the life cycle costs (over 20 year) for the collection system.

Table 5.4: Life Cycle Cost Comparison

Category	Option 1 Gravity System	Option 2 Pressure Sewer
Total Annual Operation Costs	\$43,500	\$55,038
20 years Operations Cost - Present Value	\$427,000	\$684,000
Capital Cost*	\$48,449,500	\$39,826,110
Net Present Value	\$50,267,200	\$42,269,700

*From Appendix E. Note: Capital costs are exclusive of contingencies.

6 Recommended Option

Regardless of the sewer collection system selected, the costs associated with the WWTP remain separate from the sewer system. As per the results of the System Assessment carried out by CBCL in 2022, a new SBR treatment process at the existing TCH WWTP site is the recommended option for the TCH WWTP upgrade.

The sizing and costing of a new SBR WWTP proposed in this study are greater than those estimated in the 2022 report. This is due to the expansion of treatment capacity to service additional communities as well as the significant increase in construction costs experienced since the completion of the 2022 report. This significant increase in construction cost has been experienced industry wide and is a function of low availability of skilled labour in addition to global factors.

Based on Capital Cost estimates, the recommended buildout option for the WWTP is to initially build the WWTP with capacity to service the full Southern Loop (Buildout C). This option would lead to higher costs incurred initially but likely result in an overall cost savings of approximately \$1 million i.e., full Southern Loop service through Buildout C would cost \$5.64 million while full service through Buildout B1 plus B2 would cost \$6.65 million (\$4.95 million + \$1.7 million).

From both a capital and life cycle cost perspective, Option #2, a pressurized EST system has the lowest estimated cost. Although annual operating costs are slightly higher for Option #2, the NPV of the overall costs indicates possible cost savings. Based on the preliminary cost analysis, Option #2 is the recommended option for expanding wastewater treatment services to neighbouring communities in the Southern Loop.

7 References

ACWWA. (2022). *Atlantic Canada Wastewater System Guidelines*.

Metcalf and Eddy. (2014). *Wastewater Engineering Treatment and Resource Recovery*. Fifth Edition.

Statistics Canada . (2023). *Census Profile, 2021 Census of Population* . Retrieved from Statistics Canada Catalogue.

We hope you find this Feasibility Study of interest. We are available, at your convenience, to discuss in more detail any aspect of this report.

Prepared by:
Helena Steeves, EIT, M.ASc.
Process Engineer in Training

Reviewed by:
Nick Moriarty, B.Eng.
Process Specialist

APPENDIX A

Proposed Sewer Main Network



Legend

- Existing gravity sewer
- Existing forcemain to WWTP
- Proposed sewer mains
- No sewer system
- Proposed pump stations (gravity sewer)
- ➔ Flow path

2 ISSUED FOR REPORT							
No.	Description	No.	Description	No.	Description		
Date	Scale	Designed	Drawn	Checked	Approved	CBCL No.	Contract
11/07/23	N.T.S.		HS	NM	NM	230814.00	-



TOWN OF CLARK'S HARBOUR WWTP FEASIBILITY STUDY

PROPOSED SEWER MAIN NETWORK

Drawing

SK01

APPENDIX B

Proposed Sewer Main Zoning



Legend

- Existing gravity sewer
- Existing forcemain to WWTP
- No sewer system
- Zone 1
- Zone 2
- Zone 3

0 ISSUED FOR REPORT							
No.	Description	No.	Description	No.	Description		
Date	Scale	Designed	Drawn	Checked	Approved	CBCL No.	Contract
11/07/23	N.T.S.	-	HS	NM	NM	230814.00	-



TOWN OF CLARK'S HARBOUR WWTP FEASIBILITY STUDY

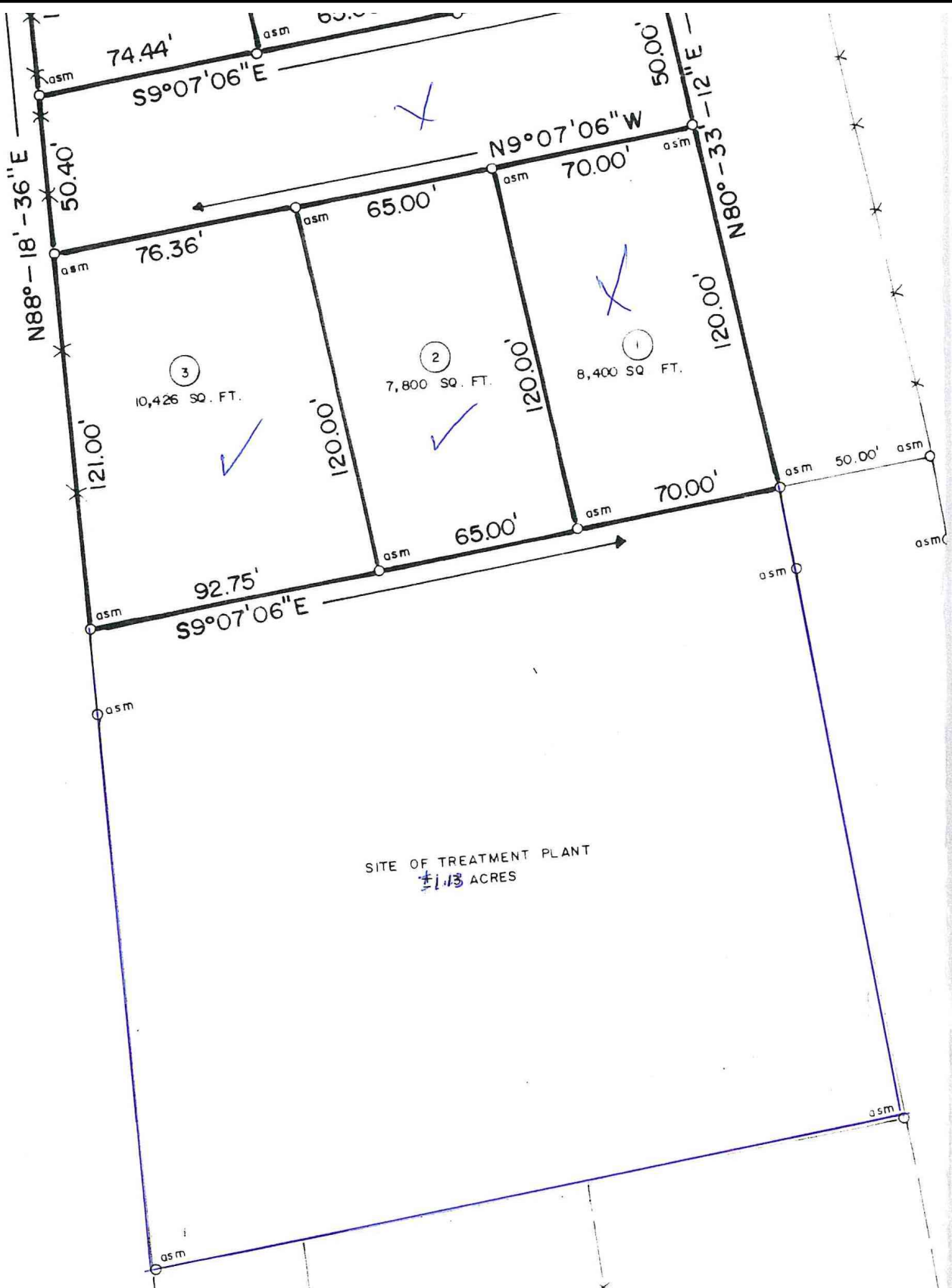
PROPOSED SEWER NETWORK BUILD OUT ZONES

Drawing

SK02

APPENDIX C

Site Arrangements & Lots



SITE OF TREATMENT PLANT
1.13 ACRES

1 ISSUED FOR REPORT							
No.	Description	No.	Description	No.	Description	No.	Description
Date	Scale	Designed	Drawn	Checked	Approved	CBCL No.	Contract
11/07/2023	N.T.S.	-	-	HS	NM	230814.00	-



TOWN OF CLARK'S HARBOUR FEASIBILITY STUDY

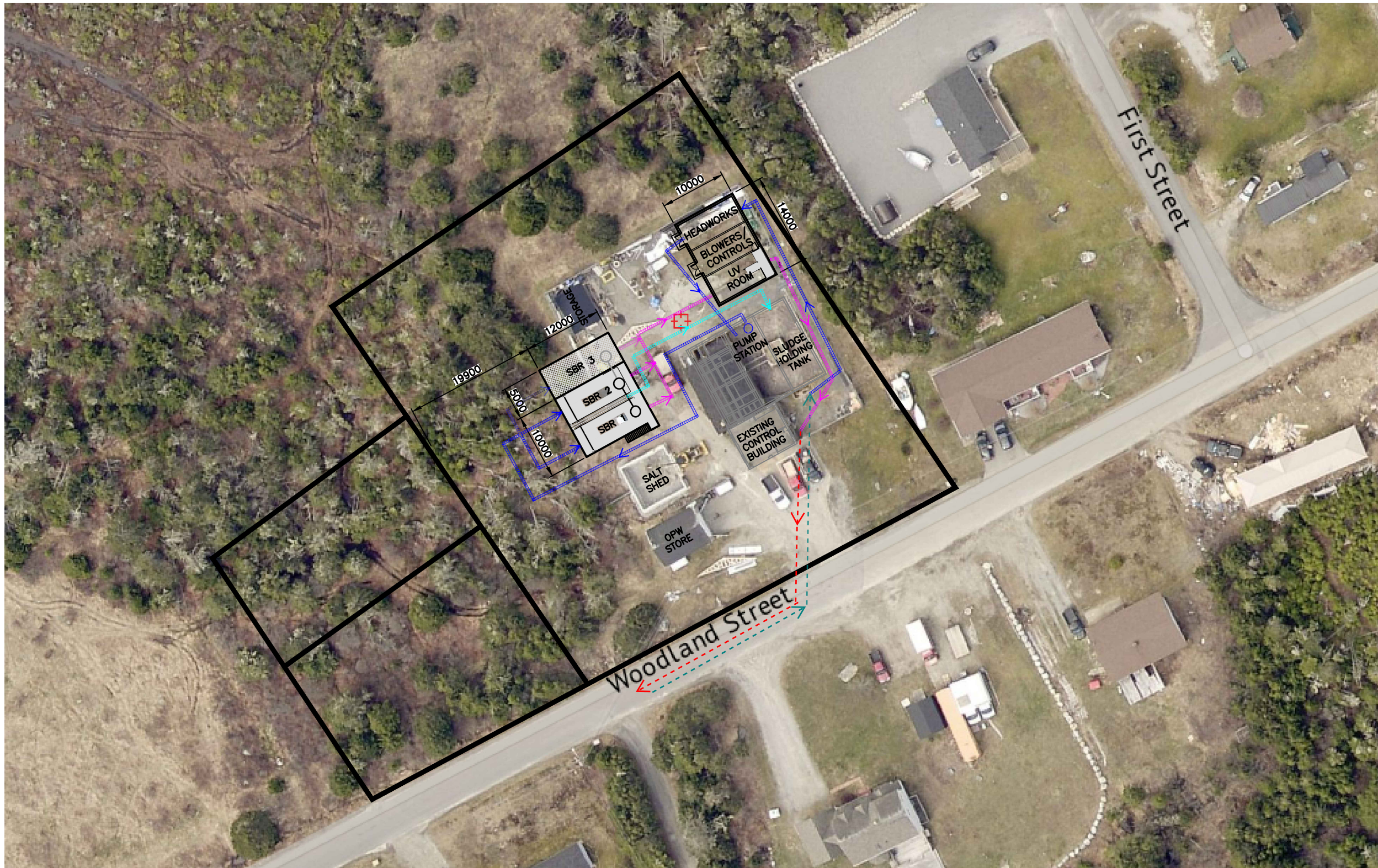
SITE ARRANGEMENTS AND LOTS

Drawing
SK03

APPENDIX D

Site Plan Outline

DRAWING NAME: Y:\HALIFAX\DATA\PROJECTS\2023\230814.00\TOCH REGIONAL PLANT FEASIBILITY STUDY\44 CAD\06 PROCESS\230814.00_SK04.DWG LAYOUT NAME: SK04 PLOT DATE: Thursday, July 6, 2023 9:09:55 AM CAD OPERATOR: DBR880



- Legend
- - - Existing forcemain 100 mm
 - - - Proposed forcemain 100 mm
 - - - Gravity line 150 mm
 - - - Sludge line 75 mm
 - - - Existing gravity outfall 200 mm

	Date 11/07/2023	Scale N.T.S.	Designed --	Drawn DB	Checked HS	Approved NM	CBCL No. 230814.00	Contract --	
	TOWN OF CLARK'S HARBOUR FEASIBILITY STUDY						Drawing		
	CBCL						SK04		
	1 ISSUED FOR REPORT						SITE PLAN OUTLINE		
No.	Description								

APPENDIX E

Opinion of Probable Cost Summaries




OPINION OF PROBABLE CONSTRUCTION COSTS

Town of Clark's Harbour WWTP
SBR Treatment System Upgrade and Collection System Expansion

DATE:	July 11, 2023
CBCL FILE No.:	230814.00
EST. DESCRIPTION :	Class D

No.	DESCRIPTION	Option 1: Conventional Gravity Sewer System				Option 2: Pressurized Effluent Sewer System			
		QTY.	UNIT	MATERIAL COST		QTY.	UNIT	MATERIAL COST	
				\$/ UNIT	\$			\$/ UNIT	\$
1	Collection System								
1.1	Zone 1								
	Sewer Force Mains	4,750	m	\$ 1,000	\$ 4,750,000	9,500	m	\$ 900	\$ 8,550,000
	Sewer Gravity Mains	5,750	m	\$ 1,200	\$ 6,900,000	--	--	--	--
	Duplex Pump Station	5	ea	\$ 120,000	\$ 600,000	--	--	--	--
	Manholes (every 100 m)	60	ea	\$ 10,000	\$ 600,000	--	--	--	--
	Effluent Sewer Tank & Connection Kit	207	ea	\$ -	\$ -	207	ea	\$ 12,300	\$ 2,546,100
	Sewage Connections (house to main or house to tank, tank to main)	207	ea	\$ 15,000	\$ 3,105,000	207	ea	\$ 5,000	\$ 1,035,000
	Effluent Sewer Tank Install	207	ea	\$ -	\$ -	207	ea	\$ 10,000	\$ 2,070,000
	Upgrade Existing TCH PS	5	ea	\$ 60,000	\$ 300,000	1	ea	\$ 120,000	\$ 120,000
	General Contractor Overheads and Profit, Fees		15%		\$ 2,438,250				\$ 2,148,165
	TOTAL ESTIMATED ZONE 1 COLLECTION SYSTEM COSTS (Excluding Contingencies, Allowance & Factors)				\$18,693,250				\$ 16,469,265
1.2	Zone 2								
	Sewer Force Mains	600	m	\$ 1,000	\$ 600,000	4,500	m	\$ 900	\$ 4,050,000
	Sewer Gravity Mains	4,250	m	\$ 1,200	\$ 5,100,000	--	--	--	--
	Duplex Pump Station	3	ea	\$ 120,000	\$ 360,000	--	--	--	--
	Manholes (every 100 m)	60	ea	\$ 10,000	\$ 600,000	--	--	--	--
	Effluent Sewer Tank & Connection Kit	56	ea	\$ -	\$ -	56	ea	\$ 12,300	\$ 688,800
	Sewage Connections (house to main or house to tank, tank to main)	56	ea	\$ 15,000	\$ 840,000	56	ea	\$ 5,000	\$ 280,000
	Effluent Sewer Tank Install	56	ea	\$ -	\$ -	56	ea	\$ 10,000	\$ 560,000
	Upgrade Existing TCH PS	-	ea	\$ 60,000	\$ -	-	ea	\$ 120,000	\$ -
	General Contractor Overheads and Profit, Fees		15%		\$ 1,125,000				\$ 836,820
	TOTAL ESTIMATED ZONE 2 COLLECTION SYSTEM COSTS (Excluding Contingencies, Allowance & Factors)				\$8,625,000				\$ 6,415,620
1.3	Zone 3								
	Sewer Force Mains	4,750	m	\$ 1,000	\$ 4,750,000	8,500	m	\$ 900	\$ 7,650,000
	Sewer Gravity Mains	6,750	m	\$ 1,200	\$ 8,100,000	--	--	--	--
	Duplex Pump Station	6	ea	\$ 120,000	\$ 720,000	--	--	--	--
	Manholes (every 100 m)	80	ea	\$ 10,000	\$ 800,000	--	--	--	--
	Effluent Sewer Tank & Connection Kit	255	ea	\$ -	\$ -	255	ea	\$ 12,300	\$ 3,136,500
	Sewage Connections (house to main or house to tank, tank to main)	255	ea	\$ 15,000	\$ 3,825,000	255	ea	\$ 5,000	\$ 1,275,000
	Effluent Sewer Tank Install	255	ea	\$ -	\$ -	255	ea	\$ 10,000	\$ 2,550,000
	Upgrade Existing TCH PS	3	ea	\$ 60,000	\$ 180,000	1	ea	\$ 120,000	\$ 120,000
	General Contractor Overheads and Profit, Fees		15%		\$ 2,756,250				\$ 2,209,725
	TOTAL ESTIMATED ZONE 3 COLLECTION SYSTEM COSTS (Excluding Contingencies, Allowance & Factors)				\$21,131,250				\$ 16,941,225
	TOTAL ESTIMATED COLLECTION SYSTEM COSTS (Excluding Contingencies, Allowance & Factors)				\$ 48,449,500				\$ 39,826,110
	Contingency & Allowances								
	Design development contingency		25%		\$ 12,112,375				\$ 9,956,528
	Escalation/Inflation (based on 2023 dollars)		0%		\$ -				\$ -
	Location Factor		1.20		\$ 9,689,900				\$ 7,965,222
	Construction Contingency		25%		\$ 12,112,375				\$ 9,956,528
	TOTAL ESTIMATED COLLECTION SYSTEM COSTS (Including Contingencies, Allowance & Factors)				\$ 82,364,150				\$ 67,704,387

 OPINION OF PROBABLE CONSTRUCTION COSTS Town of Clark's Harbour WWTP SBR Treatment System Upgrade and Collection System Expansion				DATE: July 11, 2023					
				CBCL FILE No.: 230814.00					
				EST. DESCRIPTION : Class D					
No.	DESCRIPTION	QTY.	UNIT	Option 1: Conventional Gravity Sewer System		Option 2: Pressurized Effluent Sewer System			
				MATERIAL COST		QTY.	UNIT	MATERIAL COST	
				\$ / UNIT	\$			\$ / UNIT	\$
2	Wastewater Treatment Plant (Servicing Full Southern Loop)								
	Mobilisation, Bonds, Insurance, Pre Construction Management				\$ 157,967		\$ 157,967		
	Civil Work				\$ 162,000		\$ 162,000		
	Demolition				\$ 26,100		\$ 26,100		
	Reinforced Concrete				\$ 136,000		\$ 136,000		
	Masonry and Walls				\$ 40,000		\$ 40,000		
	Roof Structure and Roofing				\$ 65,000		\$ 65,000		
	Miscellaneous Metals				\$ 33,000		\$ 33,000		
	Interior/Exterior Building Finish				\$ 51,000		\$ 51,000		
	Process Equipment				\$ 1,409,000		\$ 1,409,000		
	Valves and Piping				\$ 122,000		\$ 122,000		
	Process Integration (Instrumentation & Control)				\$ 128,000		\$ 128,000		
	HVAC				\$ 82,000		\$ 82,000		
	Electrical				\$ 493,150		\$ 493,150		
	General Contractor Overheads and Profit, Fees		15%		\$ 412,088		\$ 412,088		
	TOTAL ESTIMATED WASTEWATER TREATMENT PLANT COSTS (Excluding Contingencies, Allowance & Factors)				\$ 3,317,304		\$ 3,317,304		
	Contingency & Allowances								
	Design Development Contingency Allowance		25%		\$ 829,326		\$ 829,326		
	Escalation/Inflation (based on 2023 dollars)		0%		\$ -		\$ -		
	Location Factor		1.20		\$ 663,461		\$ 663,461		
	Construction Contingency		25%		\$ 829,326		\$ 829,326		
	TOTAL ESTIMATED WASTEWATER TREATMENT PLANT COSTS (Including Contingencies, Allowance & Factors)				\$5,639,417		\$5,639,417		
	TOTAL OPINION OF PROBABLE CONSTRUCTION COST exc. HST				\$ 88,003,567		\$ 73,343,804		
	HST		15%		\$13,200,535		\$11,001,571		
	TOTAL OPINION OF PROBABLE CONSTRUCTION COST inc. HST				\$101,205,000		\$84,346,000		

*Escalation/Inflation factor based on 2023 dollar value

Contingencies for collection system shown for combined system, i.e., Zone 1 + 2+ 3

- | | |
|---------------|---|
| Note 1 | A Design Development Contingency Allowance is so necessary design changes impacting construction costs can be made as the design is developed. |
| Note 2 | A Construction Contingency is to allow for Change Order costs of additional work over and above the contract Awarded price |
| Note 3 | The Escalation/Inflation allowance is for increases in construction costs from time the budget to Tender Call |
| Note 4 | The Location Factor is for variances between construction co The Location Factor is for variances between construction costs at the location of the project & historical costs data |



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STAFF REPORT

SUBMITTED BY: Chris Frotten

DATE: January 9, 2024

SUBJECT: Single Special Clean-Up

STRATEGIC OBJECTIVE: N/A

ORIGIN

In March 2023, it was decided to move to a single clean-up in 2024/25 and beyond. Negotiations with our service provider have begun but the decision on when to hold the clean-up. This report recommends a time of year for the special clean up and seeks Council's approval.

BACKGROUND

Historically, our special clean-ups have been conducted twice a year, in spring (April) and fall (September). This regularity has been a long-standing practice aimed at addressing seasonal shifts in waste accumulation, enhancing the overall cleanliness of our communities, and facilitating the convenient disposal of larger items for residents. The spring clean-up has historically been timed to coincide with the end of winter, targeting the aftermath of colder months when equipment, household items and other forms of waste accumulate. The fall clean-up, on the other hand, traditionally focuses on clearing away the remnants of summer activities. With increased outdoor events, tourism, and recreational activities during the summer months, this clean-up aims to address post-summer waste accumulation and ensure a tidy environment as we transition into the colder months.

In addition to the biannual special clean-ups, we have long offered a one bulky item pick-up service during the regularly scheduled weekly collection service. The bulky item pick-up service has traditionally allowed residents to dispose of one larger item (i.e. appliances, mattresses, etc.) that may not be suitable for regular waste collection. However, despite its availability, this service has not been utilized to its full potential, and there is an opportunity to enhance awareness and promote its use as an alternative to some aspects of the special clean-ups.

DISCUSSION

When deciding on a time of the year for the single special clean-up, several key factors should be carefully considered to ensure its effectiveness.

Firstly, selecting a time that aligns with favorable weather will create an environment conducive to outdoor activities and encourage higher participation.

An in-depth analysis of seasonal waste accumulation patterns is essential. By understanding when debris and waste generation are at their peak, the clean-up can be strategically scheduled to address the most pressing community needs.

If the objective is to manage post-seasonal waste, the timing should afford residents the opportunity to prepare their properties accordingly. Whether it involves cleaning up after winter or addressing the aftermath of summer activities, the scheduling should reflect the practical needs of the community.

Coordination with waste management services is crucial. Ensuring that the chosen timing aligns with their operational capacity optimizes resource allocation and facilitates efficient disposal logistics.

Reflecting on past events provides valuable insights. An evaluation of outcomes and challenges informs decision-making and allows for continuous improvement in the planning and execution of the single special clean-up.

In the future, consideration should be given to exploring the feasibility of collecting metals exclusively. The input from the collector, who indicates that metals constitute the majority of items picked up during special clean-ups, presents a compelling case for this focused approach. By targeting metal collection, the municipality stands to realize significant cost reductions associated with waste disposal. As part of the decision-making process, it would be beneficial to conduct a thorough analysis of the potential savings and logistics involved in implementing a specialized metal collection approach.

BUDGET IMPLICATIONS

Implementing a single special clean-up instead of two is anticipated to yield cost savings for the municipality, prompting the need for negotiations with the service provider to establish a revised contract amount. The negotiation process will be characterized by a thorough consideration of various factors, particularly the potential increase in waste volume during a single special clean-up compared to two separate clean-ups.

The rationale behind the cost savings lies in the streamlined operational efficiency and resource optimization that a singular, well-coordinated clean-up allows. As the municipality transitions to a more cost-effective approach, negotiations with the service provider will take into account the adjusted scope of work, changes in logistical coordination, and potential shifts in staffing requirements.

This strategic shift to a single special clean-up not only reflects a commitment to financial prudence but also emphasizes the municipality's dedication to optimizing resources in an environmentally sustainable manner.

LEGAL IMPLICATIONS

N/A

PUBLIC CONSULTATION/COMMUNICATIONS

It will be important to implement a comprehensive communication plan to effectively inform the public about the reduction in special clean-ups. This plan should involve a multifaceted approach aimed at ensuring clarity, engagement, and community understanding and should encompass key elements such as clear messaging, multi-channel communication, digital platforms, visual aids and infographics and timely updates.

Developing a clear and concise message that articulates the rationale behind the decision to reduce the frequency of special clean-ups will emphasize the benefits, such as cost savings, improved efficiency, and the municipality's commitment to sustainable waste management practices.

Utilizing a variety of communication channels such as press releases, updates on the municipality's website, social media announcements, newsletters, and community bulletin boards will help us reach a broader audience. Leveraging digital platforms such as the municipality's official website and social media accounts are great tools to provide detailed information, updates, and frequently asked questions (FAQs). This ensures accessibility and real-time communication.

Creating visual aids and infographics that succinctly illustrate the changes in the clean-up schedule, highlighting the benefits and encouraging residents to actively participate in the remaining special clean-up event.

Finally, providing timely updates throughout the transition period to keep residents informed about the progress and address any emerging concerns will help build understanding within the community.

RECOMMENDATION

After careful consideration and in consultation with our current service provider, it is our recommendation that the timing of the special clean-up be early to mid-September, with the goal of optimizing efficiency and addressing specific community needs.

SUGGESTED MOTION

That it be recommended to Council that the one single special clean-up in 2024/25 and the single clean-ups conducted in subsequent years be held in early to mid-September.

ALTERNATIVES

- Council may choose to conduct the special clean-up at another time of the year.

ATTACHMENTS

N/A