



**SOURCE WATER PROTECTION
Town Hall – Council Chambers
Wednesday, March 19th, 2025
5:30pm**

AGENDA

1. Call to Order
2. Approval of Agenda
3. Approval of the Minutes – July 22, 2024
4. New Business
 - i. Election of Chair
 - ii. Election of Vice Chair
5. Old Business
 - i. Review Staff Report (Adam)
 - ii. Review Action Items (Adam)
 - iii. Reservoir and Wellfield Update (Jeff)
6. Information/Discussion Items
 - i. Discuss SWPP and yearly update to Nova Scotia department of Environment and Climate Control
7. Anything by Members
8. Next Meeting Date
9. Adjournment

SOURCE WATER PROTECTION ADVISORY COMMITTEE

Monday, July 22nd, 2024

A meeting of the Source Water Protection Advisory Committee was held at the Town Hall on Monday, July 22nd, 2024, starting at 5:00 p.m.

PRESENT

Councillor Chad LeBlanc, Chair; Councillor Bernadette Knapp; Public Works Water Operator, Jeff Hurlburt; Director of Public Works, Adam Verran; Town of Middleton Landowner Representatives, Brenda Ford and Ron Brown; NS Environment and Climate Change Representative, Mike Allen; Annapolis County Councillor Wendy Sheridan; Annapolis County Planner and Development Officer, Linda Bent; Recording Secretary, Dayle Crook.

Regrets: Middleton Planner and Development Officer, Dawn Sutherland; Chief Administrative Officer, Ashley Crocker; County of Annapolis Landowner Representative: **Vacant**

1. CALL TO ORDER

Chair LeBlanc called the meeting to order at **5:02** p.m.

2. APPROVAL OF AGENDA

Councillor Bernadette Knapp requested that there be a full agenda package provided (hole-punched) and physical copies of Agenda for next meeting, for all parties.

240722.01: It was moved and seconded that the agenda be approved. Motion carried.

3. APPROVAL OF THE MINUTES

240722.02: It was moved and seconded to approve the Minutes of October 23rd, 2023, as circulated. Motion carried.

4. NEW BUSINESS

i. Introduction of new appointed committee member(s)

Chair LeBlanc asked everyone to introduce themselves, and introductions took place.

ii. Source Water Protection Advisory Committee and Committees of Council Policies

Source Water Protection Advisory Committee policy and Committees of Council policies reviewed and approved; no changes suggested for these documents.

iii. Election of Chair and Vice Chair

Chair LeBlanc called for nominations and Chad LeBlanc was nominated and accepted the nomination.

- Councillor Knapp called for nominations a 2nd time and there were no nominations
- Councillor Knapp called for nominations a 3rd time and there were no nominations
- Chad LeBlanc was acclaimed as Chair of the Source Water Protection Committee

iv. Election of Vice Chair

Chair LeBlanc called for nominations and Councillor Bernadette Knapp was nominated and accepted the nomination.

- Chair LeBlanc called for nominations a 2nd time and there were no nominations
- Chair LeBlanc called for nominations a 3rd time and there were no nominations
- Councillor Bernadette Knapp was acclaimed as Vice Chair of the Source Water Protection Committee

5. OLD BUSINESS

i. Review Staff Report

Public Works Director Verran stated that the staff report had been circulated and provided a brief overview of its contents.

- Linda Bent stated that the Municipality conducted a county-wide review in collaboration with the province, during which they temporarily placed the Lily Lake area in a holding pattern for protection under the zoning for source water protection. There is a policy in the Municipal Planning Strategy (MPS) that outlines the extension of the East End Planning Area up to Lily Lake, which will be included in their Secondary Plan.
- Source water protection zones will be identified on future maps. The consultant will be contacting PW Director Verran and Water Operator Hurlburt regarding rezoning.
- Director of Public Works, Verran, requested clarification regarding the installation of additional signs at Lily Lake. Councillor Knapp advised keeping the existing "No Trespassing" signs in place. There are currently 15 signs in place.
- Water Operator Hurlburt sought clarification on whether a gate should be installed at Lily Lake. The committee unanimously agreed that a gate is not necessary at this time.

ii. Review Action Items

Public Works Director Verran stated that the action items were circulated and provided a brief overview of its contents.

iii. Reservoir and Wellfield Update

A report was provided, and a discussion was held; the work is still in progress.

Pending the Utility and Review Board (UARB) the tender for the new reservoir cannot be awarded until funding is secured, as announced by the province. Currently, there is a leak of 16,000 liters per hour, which has increased since the last review. Treated water, rather than untreated water, is being lost. The leak is located behind the hill on Junction Road, with an estimated completion time of 65 weeks. The new tower will include a pump station equipped with a chlorine injector for water treatment.

Water tests are returning results well within acceptable limits. The project has been postponed for at least a year. The flow meter for pump #2 has not yet been installed, but the reservoir is still able to maintain its current maximum capacity.

6. Information/Discussion Items

- i. Discuss SWPP and yearly update to Nova Scotia Department of Environment and Climate Control

Middleton Wellfield Protection Management Report hasn't been updated since 2019.

ACTION: Review and approve the report as provided. Committee members are responsible for reviewing and approving the report as provided, including any necessary suggestions or revisions. This task must be completed by the time of the next meeting.

Updates are pending regarding changes to regulations, planning, and additional options. Protection will be applied to the relevant areas. An action plan will be presented for approval to move forward.

7. Anything by Members

Wendy Sheridan inquired about whether there is any bylaw preventing residents from installing a well on their property. Adam clarified that while there are a couple of local businesses that have requested to not connect to the town's water system, or to use town

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Monday, July 22nd, 2024

water only as a secondary source, residents will need special permission to bypass the municipal water services. In general, regular residents will be required to use the town's water supply.

Brenda Ford inquired whether taxes will increase due to the reservoir project. Adam explained that while there may be a potential increase in costs related to the installation of the reservoir, the primary factor affecting any rate changes will likely be a water rate study. This study, which has not been conducted in recent years, is required and could lead to higher charges.

Public Works Director Verran/Water Operator Hurlburt are collaborating on updating the water contingency plan. Since the plan has not been revised since 2012, they are working to ensure all policies are current and applicable. They are consulting with CBCL and considering options like trucking in water as a backup plan, which will be activated if needed. Additionally, a monitoring plan, as required by the Source Water Protection Committee, is being developed to ensure water quality is regularly assessed. The updated plan will be drafted and presented to the committee for approval.

8. Next Meeting

The next meeting will take place on Tuesday, October 15th, 2024, at 5:15pm

9. Adjournment

The meeting was adjourned at 8:02pm.

CHAIRPERSON

RECORDING SECRETARY



MEMORANDUM

TO: ☑ Source Water Protection Advisory Committee

FROM: ☑ Jeff Hurlburt, Water Operator and Adam Verran Director of Public Works

DATE: ☑ March 17 2025

SUBJECT: ☑ Staff Report and Action Items

#	ACTION ITEM	UPDATE	STATUS
1	Secondary Water Source. Lily Lake as a secondary water source is not an option. There must be a temporary short-term plan for the water supply in place in case of emergencies.	A decision was made at the July 10, 2023, meeting to leave Lily Lake as a secondary water source for the Town. An Action Plan needs to be developed which has been added at the bottom of this list.	Complete
2	Inform the public. An information sheet can be sent out in the September water bills about the importance of well-field protection, reducing water usage and the Town's boil order advisory procedures.	Information sheet has been mailed out to residents in the watershed area.	Complete
3	Identify any changes in risks inside the wellfield zones.	No changes to risks unless land ownership and agricultural uses have changed. Property owner list has been updated, and letters sent to owners to submit an update regarding land use. From the surveys that was mailed to property owners there no additional concerns or risks identified.	Completed
4	Create a procedure for dealing with spills or releases.	SOP/Contingency Plan has been created regarding spills or releases.	Completed



#	ACTION ITEM	UPDATE	STATUS
5	Create a procedure for equipment becoming inoperable for emergencies and/or due to power failure.	SOP/Contingency has been created regarding Equipment failure, & Emergency Power Outages.	Completed
6	Staff will find the most current version of mapping and the most recent Final Protection Plan.	E-mail sent to CBCL to locate the most current Final Protection Plan. CBCL responded that the most recent Protection Plan is not on their files and was edited by Town Staff.	Completed
7	Create an Action Plan on how Lily Lake will be used as a backup water source in the case of an Emergency.	Action Plan being worked on looking at possible solutions to truck water from Lilly Lake to fill reservoir. Lilly lake is no longer hooked into the towns system and the cost to tie it back into the system is too high. The new reservoir construction is under way and expected to be completed in early 2026. The new reservoir would give us more back up water in case of an emergency.	In Progress
8	Posting Signage and Enforcement: <ul style="list-style-type: none"> a. Order signs for Lily Lake b. Explore fencing around well heads c. Explore cost for installing sample sites at well heads d. Explore a gate for Lily Lake 	<ul style="list-style-type: none"> a. Signs have been received and installed at Lily Lake b. Fencing is too expensive and not in the current budget around well heads. c. Parts have been received for the Sample site taps and are awaiting installation. d. Gates for Lily Lake are not an option as there are too many access points available at Lily Lake 	In Progress
9	Designation of Wellfield as a Protected Water Area	Need direction from SWPAC.	In Progress



		Met with the West Nova Biosphere and are in communication with them on the next steps to get the well field more protected. In the new zoning map for the county the water shed is getting Zoned to limit development.	
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Appendices: None

May 1, 2024

Stephanie Barkhouse
Environment Officer
Inspection Compliance & Enforcement Division
Nova Scotia Department of Environment and Climate Change

Hello Ms. Barkhouse:

Please see our responses to the Summary of Deficiencies – Town of Middleton Municipal Public Drinking Water Supply documentation.

1. One paper and electronic copies of the final SAR, and source water protection zones in GIS format files are requested.

CBCL will provide paper copy and electronic copy of SAR and addendum to NSECC, as well as the GIS file for the source water protection zones.

2. Observation Well OW1 and Test Well TW6 are not shown on map (Per TOR 2.1.1).

Updated map attached as Attachment A.

3. It is specified that the Town does not have a back-up water supply. However, Lilly Lake is a designated protected water area, and the Distribution Map shows an “in-service watermain connected to the lake.

Lily Lake is not connected to the distribution system and is not used as a backup water supply. The protected water area and in-service water main connections remain as Lily Lake was used as the main source of water for the town. Updated Distribution map attached as Attachment B.

4. Additional information is required per TOR 2.2.2 on the purpose of Test Well TW6. Has it been decommissioned or is it being maintained for another purpose?

Test Well TW6 is currently used for level observation.

5. The most recent raw water quality data for total coliforms and E.coli from monitoring all health related parameters in the Guidelines for Canadian Drinking Water Quality (GCDWQ) could have been presented files are requested.

Microbiology testing was performed at all 3 production wells (Well #1, Well #2, & Well #3) on the 15th of December 2022. Samples were delivered to Soldier’s Memorial Hospital to be tested at Yarmouth Regional Hospital. All results came back ABSENT for E. coli & Total Coliforms. Confirmation of results are available if required.

- 6. Table A.4 indicates that the full suite of health-related parameters in the GCDWQ have not been analyzed (e.g., atrazine total coliforms, E.coli, nitrate, nitrite, PFOS, PFOA, strontium). As such, verification should not have been provided and changes/reinforcement to the monitoring program should be recommended (TOR 2.3.3).**

The operations staff in Middleton have adjusted their sampling protocols to include reviewing and comparing parameters in lab packages to ensure all required parameters are included. Additionally, all sampling reports are directly sent to the ODRC for review.
- 7. Limited trend analysis (e.g., methodology) was presented per TOR 2.3.3 & 2.3.4.**

Water quality results for the past ten years (both GCDWQ and GMPDWS) were analyzed to identify any noticeable trends between these sampling results. No significant trends of concern were identified.
- 8. Table A.5 indicates that the full suite of parameters in the Guidelines for Monitoring Public Drinking Water Supplies (GMPDWS) have not been analyzed (e.g., nitrite, strontium), as well as treated water data, as identified in the Inspection Report of the 2021 Annual Report. As such, verification should not have been provided and changes/reinforcement to the monitoring program should be recommended Per TOR 2.3.4.**

All parameters were testing during the GMPDWS, but some were omitted due to undetectable limits. All parameters are now included in the updated Table A.5 attached as Attachment C.
- 9. Sufficient information has not been provided to confirm that a procedure exists for investigating the cause of turbidity values above 5 NTU (per TOR 3.2.3). Per the March 2024 meeting, a SOP exists and will be forwarded or included in the amended/appended SAR.**

The SOP was not attached to the original SAR but was published in 2014. Turbidity Exceedance SOP attached as Attachment D.
- 10. The Transition Plan for the ODRC should have been referenced, and recommendations provided per TOR 4.3. ECC understands that an ODRC is now in-place. ECC requests that Table C.1 now be completed and signed by the ODRC. It was specified that the procedure for when the ODRC is absent is outlined in Appendix A but could not be found. Per the March 2024 meeting, updated information on the ODRC will be included in the amendment/ addendum to the SAR. A compliance item is included with this report.**

Completed Table C.1 attached as Attachment E.

Stephanie Barkhouse

May 1, 2024

11. It is unclear why not all recommendations were carried forward (e.g., additional by-product monitoring location; SWPP updates and meeting; CCC Program; ODRC). Per the March 2024 meeting, not all recommendations made by the consultant were requirements to come into compliance, some were recommendations for best practices.

The recommendations included in the table were necessary requirements for the plant to come into compliance. Any remaining recommendations included in the report were recommendations for best practices but were not necessary to implement for compliance reasons.



Prepared by:

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Process Engineer

Direct: 902-421-7241 ext.2553

E-Mail: mlea@cbcl.ca



Reviewed by:

Ben Bickerton, M.A.Sc., P.Eng.

Process Engineer

Attachments:

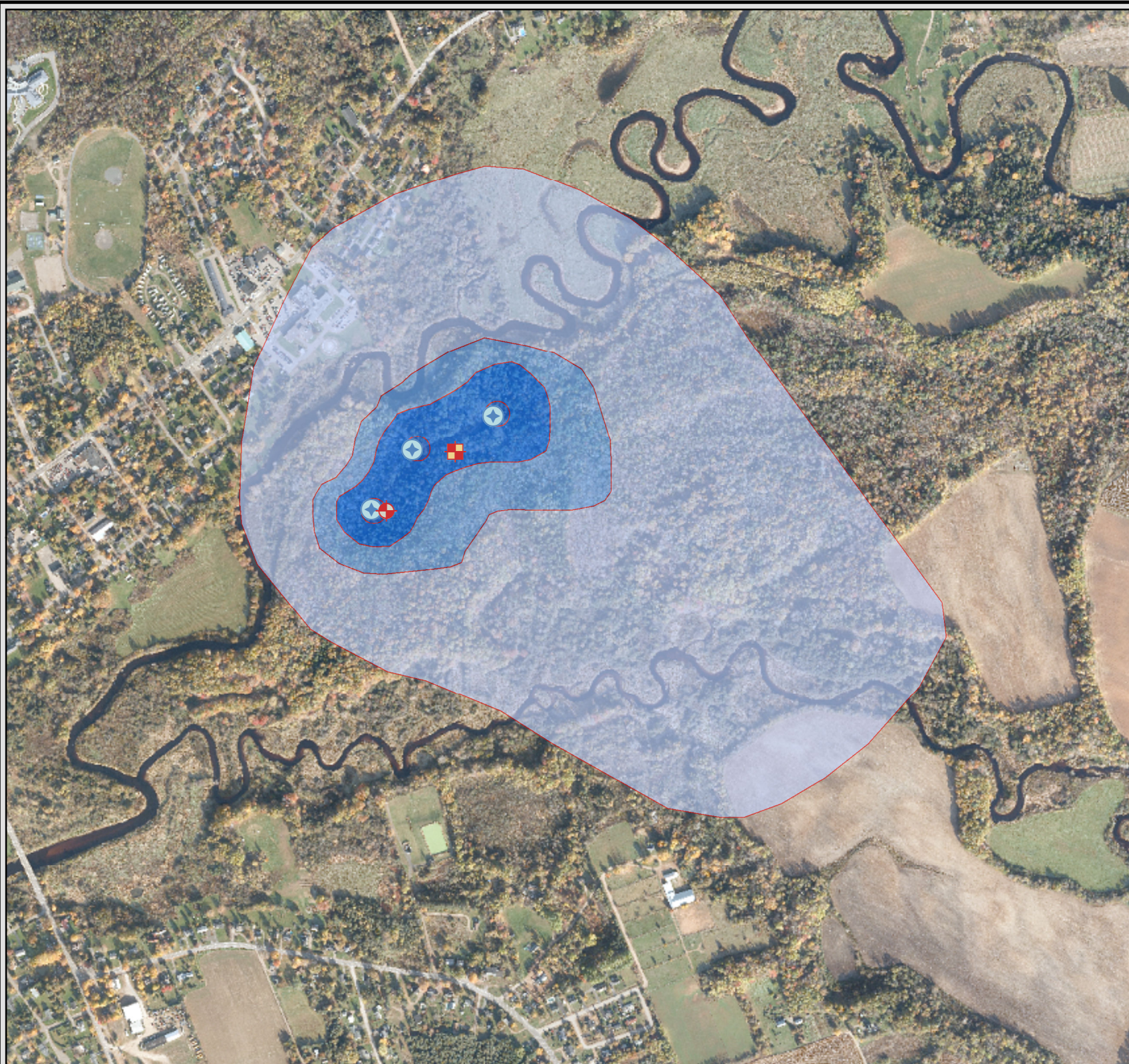
- A Watershed Boundary Plan
- B Distribution Map
- C Table A.5
- D Turbidity Exceedance SOP
- E Table C.1

Project No: 220864.00

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Attachment A

Watershed Boundary Plan



Legend








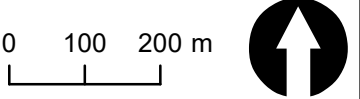
-  Production Wells
-  Observation Well (OW1)
-  Test Well (TW6)
-  Zone 1
-  Zone 2
-  Zone 3
-  Zone 4

Figure 4.0 Wellfield Protection Area

Middleton SWPP

Date: 4/9/2024

Coordinate System:
 NAD 1983 CSRS UTM Zone 20N
 Units: Meter
 Scale



Attachment B

Distribution Map

Town of Middleton

Water test site locations

March 2013
Scale 1:30 000



FEATURES

- TEST SITES

WATERMAIN STATUS

- ABANDONED
- IN SERVICE
- REPAIR
- UNCONFIRMED

TOWN BOUNDARY

144 GATES MOUNTAIN ROAD



1052 BROOKLYN ROAD



295 MARSHALL STREET



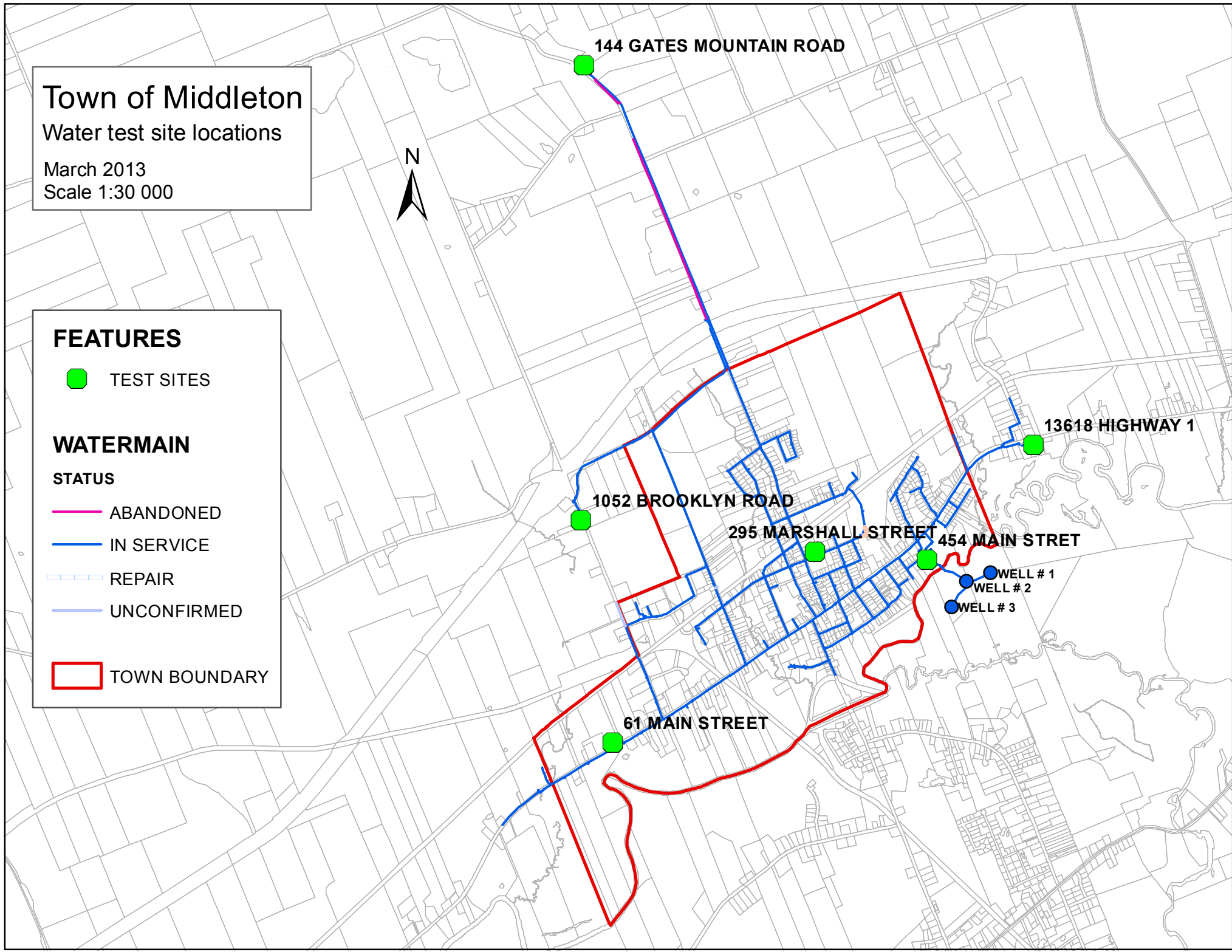
454 MAIN STREET

- WELL # 1
- WELL # 2
- WELL # 3

13618 HIGHWAY 1



61 MAIN STREET



Attachment C

Table A.5

Parameter	Health-Based Guideline	Aesthetic Guideline	Sample Location			
	(mg/L)	(mg/L)	Treated Well House (Yearly Maximum) (µg/L)	Raw Well #1 (Yearly Maximum) (µg/L)	Raw Well #2 (Yearly Maximum) (µg/L)	Raw Well #3 (Yearly Maximum) (µg/L)
Alkalinity	-	-	92	91	88	110
Aluminium	2.9	0.1	-	<5	8	<5
Ammonia	-	-	<0.03	<0.03	<0.03	<0.03
Antimony	0.006	-	<2	<2	<2	<2
Arsenic	0.01	-	<2	<2	<2	<2
Barium	1	-	13	13	33	14
Boron	5	-	10	10	15	18
Cadmium	0.007	-	<0.09	<0.09	<0.09	<0.09
Calcium	-	-	-	-	-	-
Chloride	-	≤250	-	-	-	-
Chromium	0.05	-	<1	<1	<1	<1
Colour	-	≤ 15 TCU	<5.0	<5.0	<5.0	<5.0
Conductivity	-	-	295	295	508	426
Copper	2	≤1.0	31	5	10	<1
Fluoride	1.5	-	<0.12	<0.12	<0.12	<0.12
Hardness	-	-	101	96.2	126	124
Iron	-	≤0.3	97	179	94	117
Lead	0.005	-	<0.5	0.6	1.8	<0.5
Magnesium	-	-	-	-	-	-
Manganese	0.12	≤0.02	3	19	<2	<2
Nitrate	10	-	0.22	0.24	<0.5	<0.5
Nitrite	-	-	<0.05	<0.05	<0.05	<0.05
pH	-	6.5-8.5	7.9	7.88	7.84	7.64
Potassium	-	-	-	-	-	-
Selenium	0.05	-	-	<1	<1	<1
Sodium	-	≤200	19.5	18.1	41.4	34.5
Strontium	-	-	187	192	292	204
Sulphate	-	≤500	14	14	36	25
Total Dissolved Solids	-	≤500	151	148	250	218
Total Organic Carbon	-	-	0.8	1.0	0.7	0.8
Turbidity	-	-	-	-	-	-
Uranium	0.02	-	-	6.9	7.7	9.9
Zinc	-	≤5	<5	<5	<5	<5

Attachment D

Turbidity Exceedance SOP

Contingency Plan	Town of Middleton Water Utility	Contingency Plan #: FO-6 Revision #: 1 Issue Date: Nov 2014 Pages: 2
Water Treatment and Distribution		
Contingency Plan Developed By: Town personnel with assistance from CBCL		Contingency Plan Approved By:
Elevated Turbidity in Well Water		

Turbidity refers to the cloudiness or degree of clarity of water.

Water from the production wells is monitored continuously for turbidity by an online instrument, and shall not exceed 1.0 NTU in at least 95% of the time each calendar month. Turbidity in the water distribution system is monitored at the same frequency as required for bacteriological sampling, and shall be 5.0 NTU or less.

Turbidity in production well water may indicate the entry of surface water and/or casing leakage. The concern with elevated turbidity is that bacteria, viruses, and parasites can attach themselves to the suspended particles. The particles, in turn, can then interfere with the disinfection process by shielding the contaminants from the disinfectant.

This CP shall be followed when continuous turbidity monitoring of production well water indicates unexplained fluctuations and/or turbidity levels exceeding 1.0 NTU 95% of the time each calendar month.

Consultation with NSE

Contact NSE to inform them that continuous turbidity monitoring at the wells indicates unexplained fluctuations and/or turbidity levels exceed 1.0 NTU 95% of the time each calendar month. Advise NSE if the use of the well is to be maintained while an investigation is conducted to determine the source, or if the well is to be taken out of service.

Well Operation

It is critical that the production wells are operated within the documented production capacities. If investigation findings indicate that the production well is being over pumped, immediate steps should be taken to return the well to its approved pumping rate.

If investigation findings indicate that the well water level and pumping rates are acceptable, SOP FO-1 (Wellfield Inspections) and/or SOP FO-2 (Well Maintenance) should be performed.

Potential Causes of Elevated Turbidity and Action Options

Table 1 provides potential sources of elevated turbidity and action measures.

Table 1 Potential Source of Elevated Turbidity and Action Measures

Potential Cause of Elevated Turbidity	Identify Issue	Remedial Measures	Preventive Measures
Elevated iron and manganese	Red or black sediments in water, elevated concentrations in samples	Increase water quality monitoring	Iron and manganese treatment.
Well construction	Inspect wellhead for erosion or corrosion	Repair as required	Scheduled well inspection program
Over pumping and/or large water level change	Review water use and water level data	Immediately reduce pumping rate	Operate well within approved pumping rate
Adverse activity in wellfield	Check for activities in wellfield	Cease activity immediately	As per Source Water Protection Plan
On-line turbidity meter error	Quality control with hand held turbidity unit	Calibrate the turbidity meter	Establish QA/QC protocol

References

- NSE, The drop on Water, Turbidity

Attachment E

Table C.1

Table C.1: Operator in Direct Responsible Charge

The operator in overall direct responsible charge (ODRC) is:

Jeff Hurlburt

Signature of Operator:

Date: 4 April 2024



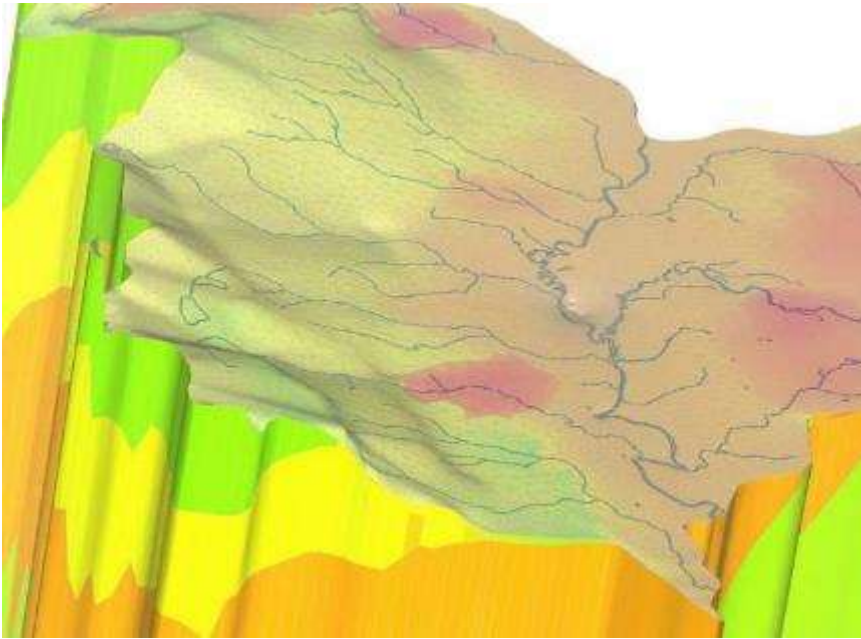
Protocols in place during the absence of the operator in ODRC include:

When on vacation/ill: The Town of Middleton has 2 operators that have level 2 water distribution qualifications sufficient to meet the minimum requirements for ODRC for the water facility. Scheduling of vacations is done in such a way that 1 operator is always present during the others absence. When ill the secondary operator is available to cover role. Both operators are fully trained & certified in the operation of the water facility.

SOP's, Contingency Plans, Operational Manuals are available at all facilities in the case of 1 operator not being available.

Other: PW staff is available to help for any instance that working alone is not deemed safe.

PW staff have also been trained in minor duties that may be required relating to the Water Utility, sufficient to the extent that all duties can be maintained if an operator is unavailable for multiple days.



Middleton Source Water Protection Plan

February 2025

V.004



CBCL LIMITED
Consulting Engineers

ISO 9001
Registered Company

Source Water Protection Plan Changes

Version	Date	Prepared by/Modified By	Significant Changes
v.001	January 5, 2009	CBCL Limited	Approved Final Draft
v.002	November 27, 2019		<ul style="list-style-type: none"> • Change Title of document to Source Water Protection Plan • Added Section 1.2 Town of Middleton Source Water Protection Committee • Added item 7 to Table 6.1 Summary of Risk Analysis
v.003	10 January 2025	Jeff Hurlburt	<ul style="list-style-type: none"> • Updates to Table 8.1 • Appendix A Updated to 2023 Property Owners • Update 1.1 • Update 3.2 • Update 4 • Update to 8. Contingency Plan, Plan has been developed and available. • Update to 9. • Entire document for minor wording changes and updates
v.004	3 February 2025	Jeff Hurlburt	<ul style="list-style-type: none"> • Addition of 1.3 Description of Water System • Added Appendix B Terms of Reference

February 24, 2025

Jeff Hurlburt
Water Utility Operator
Town of Middleton
131 Commercial St
Middleton, NS

Dear Jeff Hurlbert:

Thank you for the submission on February 3, 2025, of the Middleton Source Water Protection Plan (SWPP) dated February 3, 2025. Pursuant to Section 7 of the Terms and Conditions of your Approval to Operate #2011-077006-03, this letter will serve as acceptance of the Source Water Protection Plan for the Town of Middleton. Your approval to operate also requires you to submit an update of Source Water Protection Plan activities as part of your annual report. Your annual sampling plan should also be updated to include Source Water Protection monitoring if you have not already done so.

A SWPP is intended to be a “living” document containing the basic essential elements, which grows and advances with time to accommodate changes in the watershed or regulatory requirements, as necessary. Please note that acceptance of a SWPP does not constitute an approval of Municipal Planning Strategies and Land Use Bylaws, as they have their own processes.

Greg Cummings, Watershed Planner, is available to assist you or the Middleton Source Water Protection Advisory Committee with your ongoing work. He can be reached at 902-483-0567 or Gregory.cummings@novascotia.ca.

Sincerely,



Michael Haverstock, M.Sc., P.Eng.
District Engineer
NS Environment and Climate Change
Western Region
Kentville District Office

Cc
Jennifer Lonergan
NS Environment and Climate Change
Western Region
Kentville District Office

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Appendix

- A Property Owners in the Middleton Wellfield Protection Area**
- B Source Water Protection Advisory Committee Policy (Terms of Reference)**

1. Groundwater Protection

The Town of Middleton receives its drinking water from groundwater. To protect public health, it is therefore vital to ensure the protection of the groundwater. Once a groundwater source is contaminated it can be impossible, or extremely costly to clean up. Preventing contamination is the most effective way to ensure safe drinking water in the Town of Middleton.

The goal of the Town of Middleton Source Water Protection Plan is to provide a proactive approach to protecting groundwater, integrating municipal land use planning and other management tools.

1.1. Town of Middleton Wellfield Protection Area

This document builds on groundwater flow analysis summarized in the Town of Middleton Capture Zone Modelling Technical Report by CBCL in December 2007. The technical report established the Wellfield Protection Area based on the groundwater capture zones for the Town of Middleton's three production wells. Figure 1.1 shows the location of the wellheads, which are just beyond the Town's southern boundary as delineated by the Annapolis River, and within land falling under the land use planning jurisdiction of the County of Annapolis. This document was developed in consultation with the Middleton Source Water Protection Advisory Committee and community resource members, including community members, Town and County Councilors and organization representatives from the Town of Middleton and the County of Annapolis.

This document lays out the regulatory and policy contexts within which planning for the protection of the Middleton Wellfield takes place. Land use planning and management tools available to the Town of Middleton are highlighted. Provided is a detailed discussion and analysis of zoning, ownership and current land use in the Wellfield Protection Area. This is followed by an analysis of potential sources of risk to the groundwater supply. Specific strategies for managing risk, using a range of land use planning and other municipal tools are included. A contingency plan and strategies used in the case of a water emergency. Finally, a monitoring program, which evaluates the effectiveness of the Source Water Protection Plan.

1.2. Town of Middleton Source Water Protection Committee

The Town of Middleton's Source Water Protection Advisory Committee was established in 2019 to monitor the performance of the Source Water Protection Plan and regularly update if it does not meet its objectives.

The SWPAC also provides advice on matters concerning land-use issues, as well as water quality, levels and flows in the Source Water Protection Area.

1.3. Town of Middleton Water System

The Town of Middleton provides water to around 800 customers through the approximately 45 km of water distribution pipes which are supplied by 3 Non-GUDI wells located South of the Annapolis River in Nictaux. The 3 wells are used on a rotating basis to supply the Town's Water Utility customers and reservoir with chlorinated water. The chlorination process takes place at the Well House located at 454 Main Street

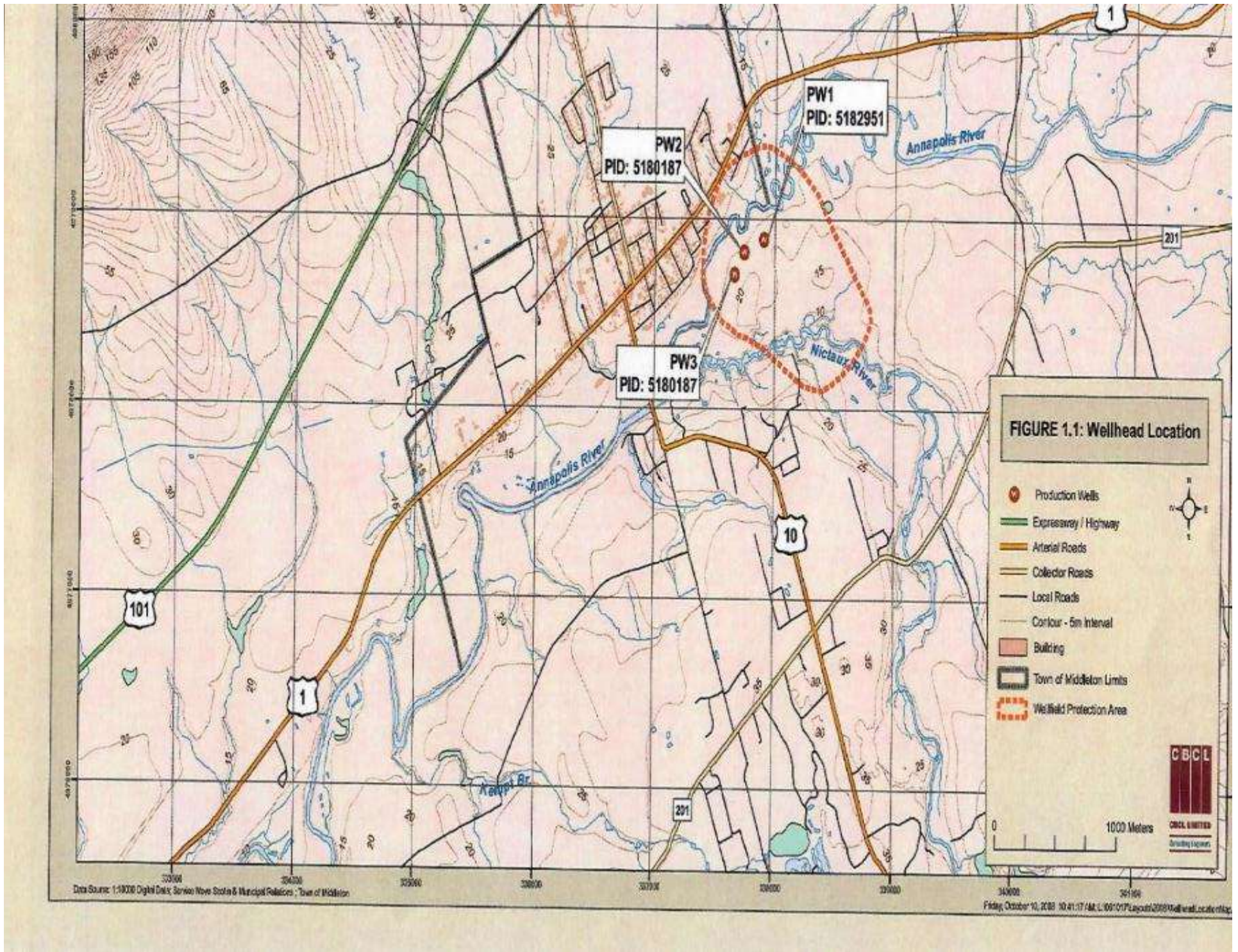
where a Hypochlorite solution regulated by Chlorine pumps is injected into the main supply line which then flows into a contact chamber before entering the distribution system. CT times are maintained and continuously monitored via the SCADA system with alarms and shut down

parameters if sufficient contact time is not achieved. The unused Chlorinated water is then boosted at the Booster Station at 411 Gates Mountain Rd. to the reservoir located at 144 Gates Mountain Rd. where it is stored, monitored & adjusted for Chlorine content to maintain an adequate supply and pressure for the Town Utility customers during wellfield shutdown.

2. Regulatory Framework

Planning to protect the groundwater supply for Middleton takes place within the broader context of federal, provincial and municipal planning regulations and policies. The following section highlights areas of provincial and federal jurisdiction and relevant legislation, and guidelines related to land use practices which pose potential risk to groundwater quantity and quality.

Section 3 will focus on the municipal level and how land use planning can be used as a tool for groundwater protection.



2.1. Drinking Water in Nova Scotia

Nova Scotia Environment & Climate Change (NSECC) is the lead agency for the provision of access to safe, adequate and reliable public water supplies. The *Environment Act, 1994-95* and the *Water Resources Protection Act, 2000* provide the legislative framework for protecting water resources. The *Environmental Goals and Sustainable Prosperity Act, 2007* is also relevant to water protection as it establishes two of the Province's long-term environmental and economic objectives as having municipal drinking water supplies meeting Provincial standards by 2008 and developing a comprehensive water-resource management strategy by 2010.

The *Environment Act* permits the designation of protected water areas surrounding any municipal water supply source. The designation may include regulations intended to prevent impairment of water quality, such as watercourse setbacks, sediment and erosion controls and animal pasture restrictions. More than twenty areas in Nova Scotia have this designation and each has slightly different restrictions depending on the needs of the community and water supply objectives.

In 2002, the Province released A Drinking Water Strategy for Nova Scotia. The strategy is a comprehensive approach based in multi-barrier management. Multi-barrier management focuses on source protection, water treatment, and monitoring and reporting on a broad, watershed basis. Wellfield protection planning and Protected Water Area designations are key components of source water protection, and the provincial strategy recommends that municipalities undertake a source water protection plan to prevent drinking water problems from occurring.

In 2004 NSECC provided municipalities with a guide for developing a source water protection plan. The guide includes five steps, which are being used to create the protection plan for Middleton:

- Form a source water protection advisory committee.
- Delineate a source water protection area boundary.
- Identify potential contaminants and assess risk.
- Develop a source water protection management plan.
- Develop a monitoring program to evaluate the effectiveness of protection.

2.2. Regulations for Public Drinking Water & Wastewater

The requirements for water and wastewater treatment facilities and monitoring are set forth in the Water and Wastewater Facilities and Public Drinking Water Supplies Regulations made under the *Environment Act*. These regulations require facilities to be operated by certified operators and classified according to size, population served and unit processes. Water and wastewater treatment facilities are classified from one through five, based on a point system outlined in the Facility Classification Standards.

Water quality monitoring and reporting is required for all public water supply systems in Nova Scotia. Regular testing must be conducted in accordance with the parameters set forth in the Guidelines for Monitoring Public Drinking Water Supplies. The microbiological, physical and chemical characteristics of a public drinking water supply cannot exceed the acceptable standards of the Guidelines for Canadian Drinking Water Quality. These guidelines are published by Health

Canada on behalf of an intergovernmental committee, based on research related to health effects, aesthetic effects and operational considerations of water quality and treatment.

2.3. On-site Sewage Disposal

The On-site Sewage Disposal System Regulations made under the *Environment Act* are to ensure the safe and clean operation of sewage systems not managed centrally by a municipality, generally for single unit residential systems. Approval from the province is required for the installation of a sewage disposal system, which must meet regulations for design, installation and distance from wells, watercourses and other features. Certification is required for both the system designer and installer. The owner of a system is responsible for its proper functioning and must make repairs to any malfunction. The On-site Sewage Disposal Systems Technical Guidelines are in accordance with the regulations and are intended to facilitate proper planning, design, selection, installation, operation and maintenance of on-site systems.

2.4. Well Construction

The Well Construction Regulations made under the *Environment Act* provide guidelines for the proper construction of groundwater wells. Improperly constructed or abandoned wells can result in contaminated surface and shallow groundwater entering the well and impacting well water or aquifer water quality. A well may not be constructed closer than the minimum distances from potential sources of contamination, particularly sewage disposal systems. A well may not be constructed in manner or location that could allow surface water to enter the well or aquifer.

A well casing at least 6.1m long is required, as well as a well liner and well screen. A minimum annular space of 25 mm outside the well casing is required. Any remaining volume of the outer borehole annulus is filled in with grout, drill cuttings or impermeable soil to the ground surface and prevents surface water from entering the annular space.

The Well Construction Regulations require the proper abandonment of wells no longer in use. The well must be immediately decommissioned by sealing it to prevent the vertical movement of water in accordance with criteria set forth in the Water Well Decommissioning Guidelines.

2.5. Petroleum Storage

The *Petroleum Management Regulations* made under the *Environment Act* include guidelines pertaining to any structure designed for the underground or aboveground storage more than 4,000 liters of liquid petroleum of any kind, including gasoline, diesel and lubricants. The regulations include installation, monitoring and removal standards, and require certification of petroleum storage tank installers. In the event of a spill, the person responsible for the petroleum storage must follow the reporting procedures outlined in the *Emergency Spill Regulations* and take the necessary steps to stop the spill, clean up the affected area and rehabilitate the environment.

Domestic heating oil tanks are regulated under different legislation. NSECC recommends the use of aboveground oil tanks that meet the national construction standards (National Standard of Canada's CAN/ULC-S602, *Aboveground Steel Tanks for the Storage of Combustible Liquids Intended to Be Used as Heating and/or Generator Fuels* & Laboratories of Canada's ULC/ORD C80, *Aboveground Non-metallic Tanks for Fuel Oil*). Insurance companies will sometimes recognize tanks constructed for longer lifespan or include containment features such as double-walled tanks. Under the Nova Scotia Fire Safety Regulations, domestic oil tanks must be installed according to national standards (Canadian Standards Association's CSA B-139, *Installation Code for Oil-Burning Equipment* (latest recognized edition and the *National Fire Code of Canada* (latest edition)). Domestic oil tanks must be installed by trained installers and be inspected regularly by a heating service professional. NSECC recommends that tanks be installed indoors rather than outdoors to avoid corrosion and weathering that may damage the tank and potentially lead to a spill and environmental contamination.

2.6. Agricultural Practices

Agricultural practices include the use or management of fertilizer, livestock, manure and other wastes. The practices which affect water supply quality are regulated federally, provincially and municipally under various legislative statutes, regulations, and bylaws. The Environmental Regulations Handbook for Nova Scotia Agriculture, published by the Department of Agriculture, summarizes the role of each regulatory body affecting agricultural operations from an environmental standpoint.

Fertilizer storage and application, except in very large quantities, is not regulated. However, fertilizer contaminating surface or groundwater could trigger charges under four separate pieces of legislation, the *Canadian Environmental Protection Act*, the *Fisheries Act*, the *Health Act* or the *Environment Act*.

The bacteria and nutrients from the feces and urine of livestock may cause a significant adverse effect to water quality. Although there is no legislation that specifically states livestock and manure are not permitted in streams, there are two laws which in effect say this. The *Fisheries Act* states that no person shall alter fish habitat without approval and "no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish" or where the substance may enter water frequented by fish. The provincial *Environment Act* also says that no one can release (knowingly or not) into the environment a substance that causes or may cause a significant adverse effect. These laws are significant because the waste of livestock qualify as deleterious substances. Additionally, the uncontrolled trampling of cattle on the banks of streams and on-stream bottoms can disturb soil and stream sediments leading to siltation. Silt is also deemed a deleterious substance under the *Fisheries Act*.

Manure Management Guidelines in Nova Scotia were developed by the Department of Agriculture in 2006. The guidelines outline manure management systems and practices that help to reduce the risk of pollution and minimize odors. Recommended actions include proper

manure storage facility siting, system design options, safety practices, ventilation and transportation methods. The National Farm Building Code specifies construction requirements for manure storage, and a permit is required.

The Environmental Farm Plan (EFP) Program was initiated in 1997 to help farmers identify and assess environmental risk by examining their farm operation from an environmental management perspective. It allows farmers to incorporate environmental considerations into business decisions, rather than addressing environmental issues as they arise. An EFP involves an environmental farm review which considers many factors, including effects to water quality. The program is led by the Nova Scotia Federation of Agriculture and NSAF, and is voluntary at this time, although it is recommended that all farmers participate.

2.7. Pesticides

The federal and provincial governments share the responsibility of pesticide regulation. Health Canada is responsible for the evaluation, registration and re-evaluation of pesticides used in Canada through the *Pest Control Products Act*. The enforcement and compliance of the import / export of pesticides or violations of label requirements are also under federal jurisdiction.

Through the Pesticide Regulations and the Activities Designation Regulations made under the *Environment Act*, NSECC regulates the sale, use, storage and disposal of pesticides. There are regulations also requiring certification of applicators and vendors of restricted or commercial class pesticides. In some cases, an approval permit is required from NSECC to apply pesticides. A permit is also required for pesticide storage.

2.8. Forestry Practices

Forest harvesting on any woodland in Nova Scotia must take place according to the *Forests Act* and Wildlife Habitat and Watercourses Protection Regulations. Requirements pertaining to water protection include leaving buffer strips (special management zones) along watercourses. Under the *Environment Act*, NSECC approval is required for the alteration of a water course by activities related to wood lot management.

2.9. Mineral Extraction

Mineral extraction in Nova Scotia falls under Provincial jurisdiction and must comply with all applicable legislation and regulations. The *Mineral Resources Act* prohibits detailed ground exploration without first obtaining all necessary approvals from the NSECC.

3. Municipal Planning and Groundwater Protection

Municipalities have an important role to play in drinking water protection. Municipal land use planning is identified by NSECC as an excellent tool in developing source water protection plans. The Nova Scotia *Municipal Government Act* (MGA) gives municipal councils authority to govern at the municipal level and sets out legislation related to municipalities. Within the MGA are several Statements of Provincial Interest that are intended to guide Provincial departments and municipalities in making land use decisions that respect the finite nature of Nova Scotia's land and water resources and lead towards sustainable development. Part VIII of the MGA focuses on planning and development and outlines legislation related to land use, ensuring consistency with Provincial interests and regulations.

3.1. Statement of Provincial Interest Regarding Drinking Water

The Statement of Provincial Interest Regarding Drinking Water in the MGA is intended to set the direction and provide guidance for how municipalities can ensure the protection of drinking water. The goal of this Statement of Provincial Interest is "To protect the quality of drinking water within municipal water supply watersheds". The Statement continues to emphasize that a "safe supply of drinking water is a basic requirement for all Nova Scotians" and that "inappropriate development in municipal water supply watersheds may threaten the quality of drinking water" (*Municipal Government Act*, 1998, Schedule B, Statements of Provincial Interest).

Decisions that Provincial departments and municipalities make about land use must be consistent with the Province's commitment to protect drinking water. The Statement requires that planning documents identify all municipal water supply watersheds within the planning area and address the protection of drinking water. It identifies land use and development restrictions as well as watershed management strategies as importation protection measures.

3.2. County and Town Land Use Planning Policies Related to Groundwater Protection

Figure 1.1 shows the location of the Town of Middleton production wells, which are outside the Town boundaries and within the Annapolis County East End Planning Area. In fact, of the total 115.27 hectares in the Middleton Wellfield Protection Area, approximately 101.87 hectares or 88% of the area is located outside of Middleton boundaries, and within the Annapolis County East End Planning Area. Planning for groundwater protection is relevant at both the County and the Town levels because of the location of the wells. Policies for groundwater protection established in the Middleton Source Water Protection Plan act together with the Town of Middleton Municipal Planning Strategy (MPS) and Land Use By-Law (LUB) as well as the Annapolis County East End Area MPS and LUB.

3.3. Town of Middleton Planning Policy and Groundwater Protection

The Town of Middleton MPS demonstrates the town’s commitment to environmental protection and states it as the first goal for the town:

“To protect the existing natural environment from unnecessary disruption and to make environmental improvements, where possible, in order to enhance Middleton as a place to live” (Town of Middleton MPS 2007, 2.2.1 Environment, page 14).

In addition, the MPS discusses the importance of being sensitive to change in both the natural and built environments and the impact one can have on the other. The Middleton MPS, section 2.13 Water Policy outlines the town’s policies about water protection and servicing including:

- Upgrading and maintaining the present water supply
- Investigating various methods of protection of the watershed area
- Co-operating with the County to ensure watershed protection.

Table 3.3 summarizes the policies regarding water supply and protection in the Middleton MPS.

Table 3.3: Town of Middleton Municipal Planning Strategy Policies Related to Groundwater Protection

Policy	Section	Description
2.13 W1.	2.13 Water Policy	Council shall continue to upgrade and maintain the present water supply system of the Town.
2.13 W2	2.13 Water Policy	Council shall investigate various methods of protection of the watershed area. The Town shall co-operate with the County to ensure the most beneficial and expedient method of protection of the watershed area.
3.7 I16.av, bii, c	Criteria for Amendment to the Land Use By-law and Evaluation of Proposals for Development Agreements	In considering amendments to the zoning in the by-law or, entering into development agreements, in addition to all other criteria as set out in various policies of this planning strategy, Council shall have regard for the following matters: That the proposal is in conformance with the intents of this Strategy and with the requirements of all other Town By-laws and regulations: (a) That the proposal is not premature or inappropriate by reason of: (v) the potential for the contamination of water courses or the creation of erosion or sedimentation. (b) That controls are contained in a Land Use By-Law or a development agreement so as to reduce conflict between the development and any other adjacent or nearby land use by reason of: (ii) emissions including air and water pollutants and noise; (c) Suitability and development costs of the proposed site in terms of steepness of grades, soil and geological conditions, marshes, swamps, or bogs and proximity of highway ramps, railway rights-of-way and other nuisance factors.

3.4. Annapolis County Planning Policy and Groundwater Protection

The Annapolis County East End Area Municipal Planning Strategy highlights the importance of water resources right at the outset when explaining the purpose of regional planning documents:

“this plan and by-law seeks to guide development by way of providing planning documents designed to **achieve harmony** among agricultural, residential, commercial and industrial uses of land, **water** and resources, and to provide and preserve all that is best about living in the urban and rural areas of Annapolis County East” (Annapolis County East End Area MPS 2004 1.ii, page 1, emphasis added).

The Annapolis County East End Area MPS demonstrates commitment to protecting the Town of Middleton’s groundwater supply through Open Space zoning. Protective measures are intended to “promote and encourage low impact developments such as forestry uses, agricultural uses, parks and passive recreation uses” in order “to minimize the negative impact development may have on this sensitive municipal water supply wellhead area”. (Annapolis County East End Area MPS 2004, 1.vi.a., page 3 & MPS 6.1, page 22).

Section 6.0 Environmental Protection, of the Annapolis County East End Area MPS outlines policies and their rationale related to the protection of the Town of Middleton’s water supply. Table 2.1 includes these policies and others related to water protection in the Annapolis East End Area MPS. Part 19 of the Annapolis County East End Area LUB discusses the uses permitted in the Enviro Open Space (OS) zone intended to protect water sources.

Table 3.4: Annapolis County East End Area Municipal Planning Strategy Policies related to Land Use and Groundwater Protection

Policy	Section	Description
6.0.1 Annapolis MPS	6.0 Environmental Protection	It is the policy of Council to designate lands owned by the Town of Middleton and surrounding the water supply well field area as "Enviro Open Space" on the Future Land Use Map.
6.1.1 Annapolis MPS	6.1 Watershed Protection	It is the policy of Council to establish an Enviro Open Space (OS) Zone in the Land Use By-law and all lands designated as “Enviro Open Space” will be zoned OS. It is also the policy of Council to set out provisions in the Land Use By-law that prohibit structures, excepting water supply facilities, from being located/erected within 100 m. (328 ft.) of a municipal water supply wellhead
6.1.2 Annapolis MPS	6.1 Watershed Protection	Within this Enviro Open Space (OS) Zone, the permitted uses shall be limited to minimize the negative impacts of development on the sensitive Middleton water supply area and to protect the quality of the water supply. Permitted uses in the Enviro Open Space (OS) Zone shall include water supply and distribution uses, park or recreational uses, conservation related uses and structures, public utilities and forestry and agricultural uses but not including structures accessory to the forestry or agricultural use.
6.1.3 Annapolis MPS	6.1 Watershed Protection	It is the policy of Council to consider altering the boundaries of the "Enviro Open Space" designation and zone if deemed necessary, as a result of further study by a qualified professional to clearly define the extent of the recharge area and protection level zones and upon

		request of the Town of Middleton. The Annapolis County East End Area Municipal Planning Strategy and Land Use By-law shall therefore be amended to reflect any change required as a result of study and/or application. It shall further be the policy of Council to be involved (as part of a committee or being a party to be consulted) in the development of any study that would result in the development of a watershed plan for the well field area and/or result in the need to alter the boundaries of the "Enviro Open Space" designation.
6.1.2 Annapolis MPS	6.2 Watercourse Setback	It is the policy of Council to include a 7.6 m. (25 ft.) watercourse setback buffer strip in the Land Use By-law in which the erection of any building or structure, other than wharves, boat houses or launches, landscaping structures such as gazebos and fishery related uses within 7.6 m. (25 ft.) of any watercourse in the Annapolis County East End Planning Area shall be prohibited. For clarification, the separation distance or setback shall be measured from the edge, meaning the ordinary high-water mark of the watercourse and the watercourse setback distance can be defined as being part of any side, rear or front yard, as the case may be, with the intention that the developer retain as much of the natural vegetation in the watercourse setback distance buffer strip as possible.
9.2.2vi, vii, ix Annapolis MPS	9.2 Land Use By- law and Amendments	In considering an application for an amendment to the Land Use By-law Council shall ensure that the amendment is in conformity with the intent and policies of this Plan and with the requirements of the Municipal Government Act and the Land Use By-law, and Council shall ensure that the proposal is not premature or inappropriate by reason of: <ul style="list-style-type: none"> vi. the potential for the contamination of watercourses, creation of erosion or sedimentation, or pollution. vii. the adequacy of storm water management and sewer and water services and utilities or if central piped services are not provided, the adequacy of physical site conditions for private onsite sewer and water systems and storm water management. ix. the suitability of the proposed site in terms of steepness of grades, soil or geological conditions, and the relative location of watercourses, and wetlands (marshes, swamps and bogs).
9.3.1iv, ix, x	9.3 Development Agreements	In considering an application for a development agreement or an application for an amendment to a development agreement, Council shall ensure that the application for a development agreement or an application for an amendment to a development agreement is in conformity with the intent and policies of this Municipal Planning Strategy and with the requirements of the Municipal Government Act, and Council shall ensure that the proposal is not premature or inappropriate by reason of: <ul style="list-style-type: none"> iv. the adequacy of municipal services with particular regard to the demand the proposed development will have on the municipal storm water system, sanitary sewer system, water system, fire protection, refuse collection and police protection. ix. the suitability of the proposed site in terms of steepness of grades, soils and geological conditions, location of

		<p>watercourses, wetlands such as marshes, fens, swamps and bogs and other nuisance factors; and x. the potential for the contamination of watercourses, creation of erosion or sedimentation, or pollution.</p>
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Municipal planning strategy policies and land use by-laws in the Town of Middleton and Annapolis County East End Area planning documents demonstrate a commitment to source water protection. Annapolis East End Area MPS policy 6.13 allows for changes to policies to strengthen water protection and ensure the quality and quantity of Middleton’s groundwater. Annapolis County policy states the council’s desire to be involved with the establishment of any future guidelines to increase the area of wellfield protection.

4. Establishing a Wellfield Protection Area

The establishment of a Wellfield Protection Area comprised of four Wellfield Protection Zones was recommended in CBCL Limited's December 2007, Town of Middleton Capture Zone Modelling: Technical Report. Zones are delineated according to the level of risk posed by contaminants for entering the groundwater. The level of risk posed by a contaminant is dependent on the length of time it stays in the aquifer, and therefore groundwater travel time is an important consideration in protecting the wellfield from potential risk of contamination. Wellfield Protection Zones are useful for informing management plan decisions; they ensure that protection measures are appropriate based on the vulnerability of each zone.

It is established that the greatest protective measures are within Wellfield Protection Zone 1 and Wellfield Protection Zone 2 because they are closest to the wells. The recommended degree of protection decreases with distance from the wells in Zones 3 and 4. In zones closest to the wellheads a broad spectrum of contaminants pose a potential threat to the security of the water supply. These contaminants are of high risk even when released at low levels, or with poor mobility in groundwater. With increasing distance from the wellhead, the list of contaminants of concern becomes narrower, focusing on those materials which readily dissolve and are transported over long distances. Figure 4.0 illustrates the Wellfield Protection Zones for the Town of Middleton water supply based on the groundwater flow model analysis summarized in the technical report. The following are descriptions, adapted from the Technical Report, of potential contamination risks associated with land uses in each zone.

4.1. Wellfield Protection Zone 1 (25-meter radius)

The zone of critical importance is the area immediately around each of the wells. This zone extends to a radius of 25 meters around each well, accounting for at least 15 days of travel time to the well heads. Activities in this zone would ideally be strictly limited to operation of the well field. Contaminants and land uses of concern in Zones 2, 3, and 4 are also of concern in Zone 1.

4.2. Wellfield Protection Zone 2 (Two Year Capture)

Wellfield Protection Zone 2 is defined by the 2-year capture zone. Contaminants of concern in Zone 2 have low mobility but pose a significant health risk to water users. The contaminants of greatest concern within this zone are bacteria (primarily E. Coli) and viruses found in municipal sewage and animal waste. Land uses associated with these contaminants include agriculture, and any type of chemical or fuel storage. Contaminants and land uses of concern in Zones 3 and 4 are also of concern in Zone 2.

4.3. Wellfield Protection Zone 3 (Five Year Capture)

Wellfield Protection Zone 3 is defined by the 5-year capture zone, an area requiring restrictions on contaminants with moderate mobility and stability in the subsurface environment. Contaminants excluded from Zone 3 pose a health risk at moderate to low concentrations and are subject to processes of adsorption and biodegradation. These materials are generally attenuated over periods of time of less than five years. Petroleum hydrocarbon users fall within this

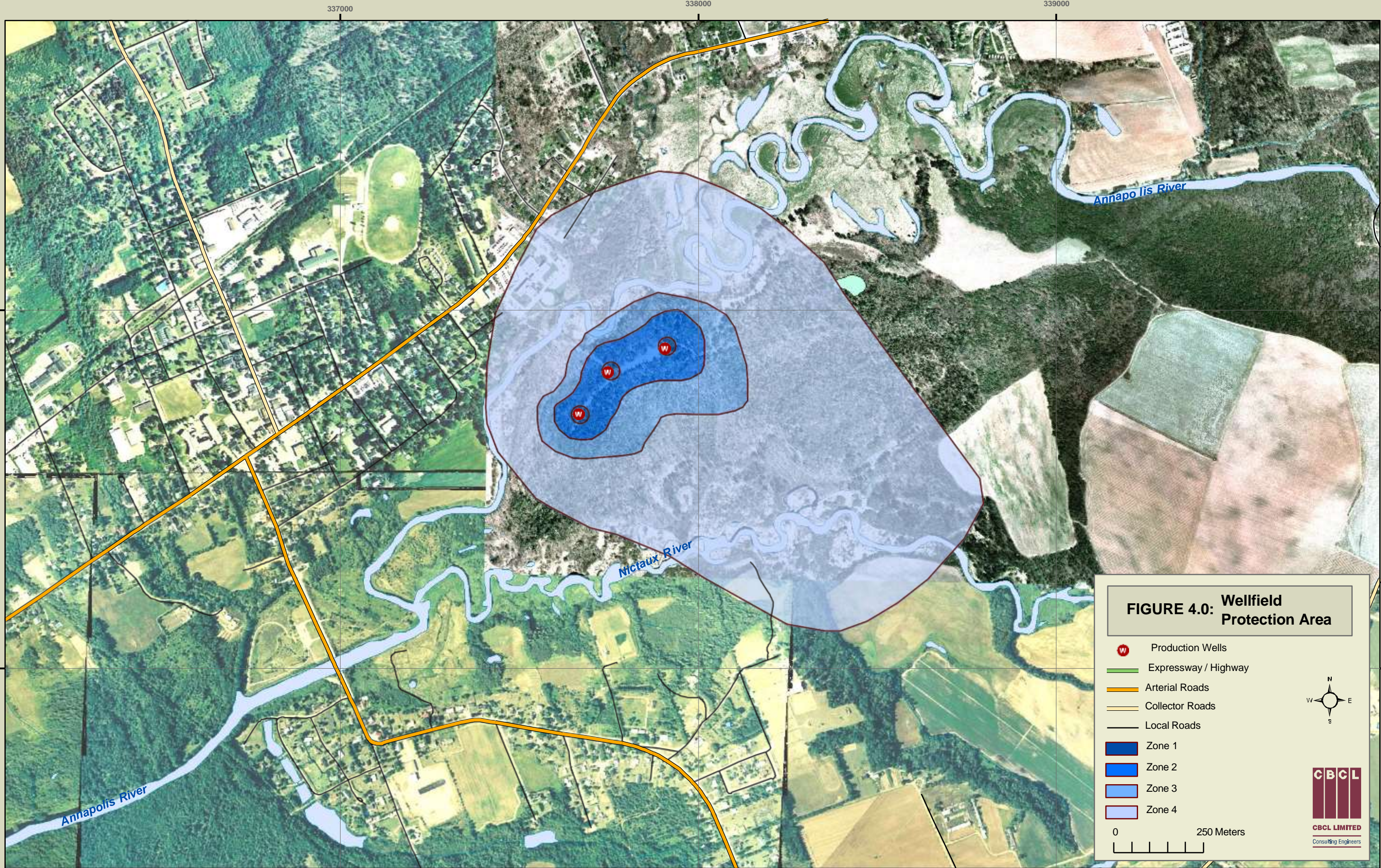


FIGURE 4.0: Wellfield Protection Area

- Production Wells
- Expressway / Highway
- Arterial Roads
- Collector Roads
- Local Roads
- Zone 1
- Zone 2
- Zone 3
- Zone 4



0 250 Meters



category, including service stations, automotive painting and repair shops, fuel storage and transfer of any kind, and auto salvage operations. Contaminants and land uses of concern in Zone 4 are also of concern in Zone 3.

4.4. Wellfield Protection Zone 4 (Twenty-five Year Capture)

Wellfield Protection Zone 4 is defined by the 25-year capture zone, created to manage contaminants which pose a health risk at low concentrations, and which are readily transported over large distances and longer time frames. Zone 4 also represents the outer boundary of the Wellfield Protection Area as a whole. Dense non-aqueous phase liquids (DNAPLs) such as trichloroethylene and perchloroethylene, which are found in dry cleaning chemicals and degreasers, have the tendency to penetrate deep aquifers and are concerns in Zone 4. Chloride, nitrate, and some metals which are readily transported in the groundwater can arrive at the well head in high concentrations. Land use activities associated with these contaminants include landfills, dry cleaning facilities, metal shops, automobile service shops, sewage disposal facilities, bulk salt storage, bulk storage of fuels and chemicals including pesticides and fertilizers.

5. Current Land Uses in the Wellfield Protection Area & Potential Risks

A land use inventory was performed in the study area, which included a review of available zoning maps, and aerial photographs from the Town of Middleton and Annapolis County and a field survey of the study area. Land use zoning in the Wellfield Protection area is shown in Figure 5.0 (Town of Middleton zones are white, and Annapolis County zones are yellow). Most of the land within the Wellfield Protection Area falls within the Annapolis County zone Open Space (OS), followed by Agriculture (AG).

Figure 5.2 illustrates the potential sources of contamination within the Wellfield Protection Area, which are discussed in the following sections:

- Zone 3: - Potential Risk: Fuel and Chemical Storage on Land zoned Agriculture
(See Section 5.2.1)
- Zone 4: - Potential Risk: Domestic Oil Tanks on Land zoned Residential Restricted
(See Section 5.3.1)
- Potential Risk: Fuel and Chemical Storage on Land zoned Institutional
(See Section 5.3.2)
- Potential Risk: Fuel and Chemical Storage on Land Zoned Highway Commercial
(See Section 5.3.3)

5.1. Wellfield Protection Zone 1 & 2 Current Land Use

Land in Wellfield Protection Zones 1 and 2 are zoned by the Annapolis County East End Planning Area By-Law as Open Space (OS). This is a restrictive zone which only permits:

- Water Supply and Distribution Uses
- Park and Passive Recreational Uses

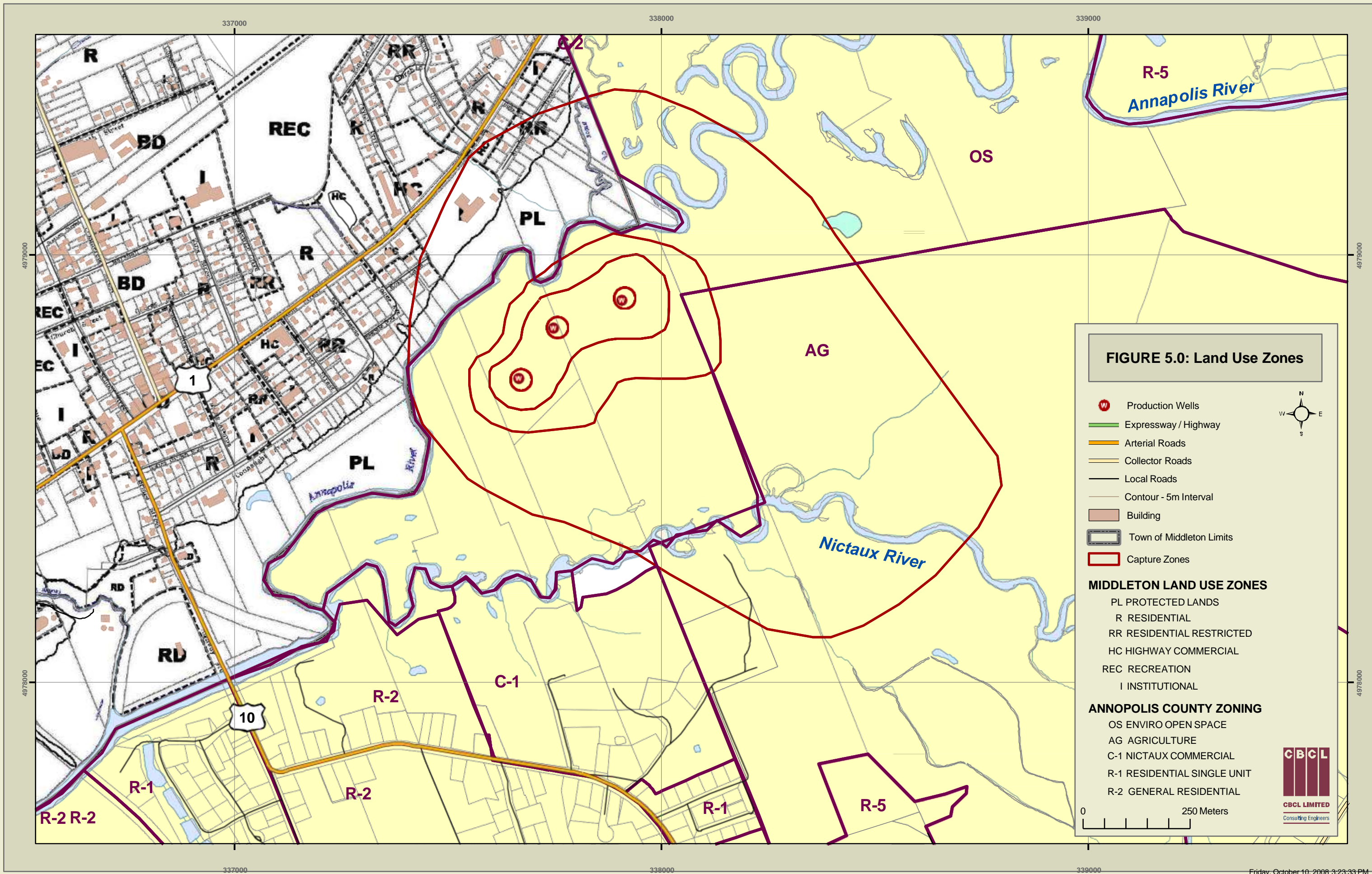


FIGURE 5.0: Land Use Zones

- W Production Wells
- Expressway / Highway
- Arterial Roads
- Collector Roads
- Local Roads
- Contour - 5m Interval
- Building
- Town of Middleton Limits
- Capture Zones

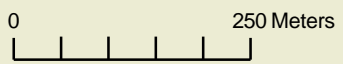


MIDDLETON LAND USE ZONES

- PL PROTECTED LANDS
- R RESIDENTIAL
- RR RESIDENTIAL RESTRICTED
- HC HIGHWAY COMMERCIAL
- REC RECREATION
- I INSTITUTIONAL

ANNAPOLIS COUNTY ZONING

- OS ENVIRO OPEN SPACE
- AG AGRICULTURE
- C-1 NICTAUX COMMERCIAL
- R-1 RESIDENTIAL SINGLE UNIT
- R-2 GENERAL RESIDENTIAL



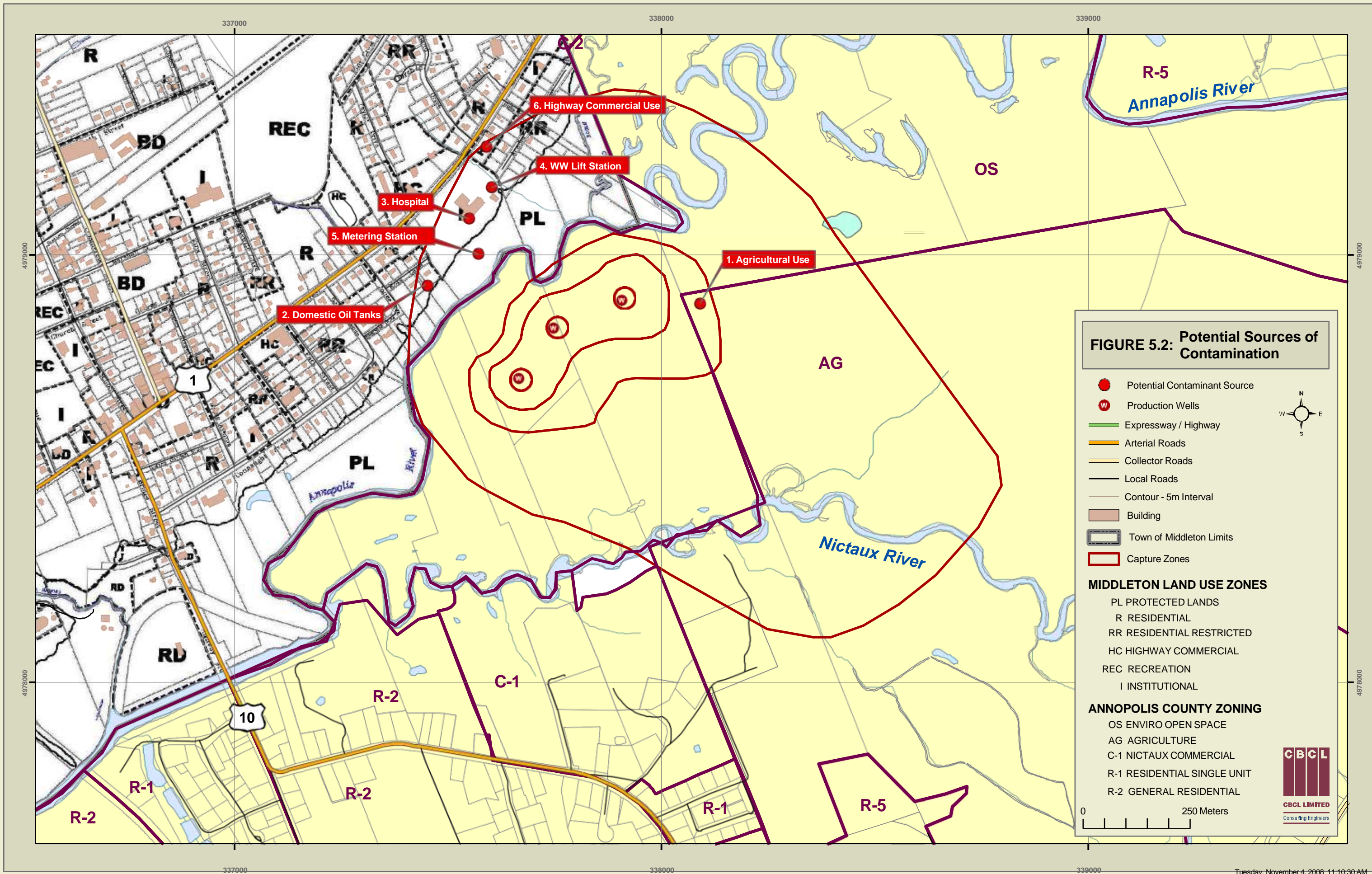


FIGURE 5.2: Potential Sources of Contamination

- Potential Contaminant Source
- W Production Wells
- Expressway / Highway
- Arterial Roads
- Collector Roads
- Local Roads
- Contour - 5m Interval
- Building
- Town of Middleton Limits
- Capture Zones



MIDDLETON LAND USE ZONES

- PL PROTECTED LANDS
- R RESIDENTIAL
- RR RESIDENTIAL RESTRICTED
- HC HIGHWAY COMMERCIAL
- REC RECREATION
- I INSTITUTIONAL

ANNAPOLIS COUNTY ZONING

- OS ENVIRO OPEN SPACE
- AG AGRICULTURE
- C-1 NICTAUX COMMERCIAL
- R-1 RESIDENTIAL SINGLE UNIT
- R-2 GENERAL RESIDENTIAL



0 250 Meters

- Conservation Related Uses and Structures
- Forestry Uses (excluding buildings or structures accessory to the operation of the forestry use)
- Agricultural Uses (excluding buildings or structures accessory to the operation of the agricultural use)

(Annapolis East End Area Land Use By-Law 2004, 19.1, page 63)

Currently, these lands are forested or abandoned fields and undeveloped, except for a dirt road providing access to the wells. Well PW1 is located at PID number 5182951. Wells PW2 and PW3 are located at PID number 5180187. Both land parcels are on land owned by the Town of Middleton. In fact, the Town of Middleton owns all the land falling within Wellfield Protection Zones 1 and 2, as well as a significant amount of land in Zone 3. (Appendix A provides a complete list of property ownership, including PID, contact name and address information for each land parcel within the Wellfield Protection Area). The Town does not allow any other use on its lands other than wellfield protection significantly limiting contamination concerns in Zones 1 and 2.

5.2. Wellfield Protection Zone 3 Current Land Use & Potential Risk

Most of the land within Zone 3 is zoned as Open Space (OS) by the Annapolis County East End Planning Area By-Law. The northern boundary of Zone 3 incorporates a segment of the Annapolis River and a portion of land within the Town of Middleton boundaries that is zoned Protected Land (PL). The PL zone only permits:

- Agricultural uses not requiring permanent structures.
- Existing residential uses.

(Town of Middleton Land Use By-Law 2007, 8.1, page 27)

Currently, land within Zone 3 is mainly forested, but also includes a dirt road providing access to the wells, abandoned fields and active pastures.

5.2.1. Potential Risk: Fuel and Chemical Storage on Land Zoned Agriculture (AG)

A potential risk in Zone 3 is a small area of land on the eastern boundary zoned AG - Agriculture by the Annapolis County East End Area Land Use By-law. The Agriculture zone permits:

- Agricultural Uses and Structures
- Farm Supportive Uses
- Existing Non-Farm Residential Uses
- Farm Markets
- Forestry Uses and Structures
- Golf Courses
- Existing Non-Farm Supportive Commercial or Industrial Uses
- Farm Residences accessory to Bona Fide Agricultural Farm Operations

- Bed and Breakfast Operations (in Existing Residential Dwellings Only)
- Home Occupations, subject to the requirements of Part 7, Section 20 (Annapolis East End Area Land Use By-Law 2004, Section 18.1, page 60)

Currently, this portion of the lot is covered by forest and not used for agriculture. However, since the zone allows agricultural use, the property owner could change the land use activities and pose a potential risk at this site. Not all agricultural uses would be of concern in Zone 3. The agricultural activities that would be of concern on this site include storage of fuel or chemicals, including pesticides and fertilizers.

5.3. Wellfield Protection Zone 4 Current Land Use & Potential Risks

Most land within Wellfield Protection Zone 4 falls within the Annapolis County East End Area zones Open Space and Agriculture. Most of the land is undeveloped forest, other areas are floodplains along the Annapolis and Nictaux Rivers or active crop fields. There are also some single detached houses within the rural area of Zone 4.

The northwestern extent of Wellfield Protection Zone 4 incorporates land within the Town of Middleton boundaries. Land in this area is zoned Protected Land (PL), Residential Restricted (RR), Institutional (I) and Highway Commercial (HC) according to the Town of Middleton Land Use By-Law. Land use associated with the Protected Land zone is not of concern for groundwater contamination in Zone 4.

5.3.1. Potential Risk: Domestic Oil Tanks on Land zoned Residential Restricted (RR)

The Town of Middleton Land Use By-Law Residential Restricted zone permits the following uses:

- Manses and rectories
- Neighborhood parks and playgrounds
- Single detached dwellings

(Town of Middleton Land Use By-Law 2007, Section 11.1, page 34)

Domestic oil tanks in Zone 4 pose a risk to groundwater if they spill or leak. They are of concern because petroleum products can remain in the groundwater for long periods of time and can be transported over long distances.

5.3.2. Potential Risk: Fuel and Chemical Storage on Land zoned Institutional (I)

The Town of Middleton Land Use By-Law Institutional zone permits the following uses:

- cemeteries, memorial gardens and places of worship
- churches, chapels and religious institutions
- clinics

- clubs and judicial facilities
- government offices and public works facilities
- hospitals
- institutions
- jails
- judicial facilities and related professional and law offices
- libraries
- museums
- private clubs and fraternal organizations
- public health and rehabilitation centers
- residential structures accessory to permitted uses the above
- schools and educational establishment

(Town of Middleton Land Use By-Law 2007, Section 16.1, page 42)

Any institutional buildings with large chemical or fuel storage tanks (underground or above ground) or salt storage piles are potential risks to groundwater contamination in Wellfield Protection Zone 4 in the event of leaks or spills.

5.3.2.1. **Soldiers Memorial Hospital**

Currently, the one property (PID # 05077821, 462 Main Street) zoned Institutional in Wellfield Protection Zone 4 is the location of the Soldiers Memorial Hospital. It poses a potential risk in the event of a leak or spill from its heating oil tank. The hospital had a new tank installed in 2007 with secondary containment. Within the AVH District Emergency Response Plan there is the intent to develop contingency-specific responses based on a hazard assessment process. A Code Brown, Hazardous Materials Incident, is being developed. It will include facility protocols and protocols for containing and managing hazardous materials spills. The hospital maintains high standards for storage of medical waste and has regularly scheduled pickups to dispose of those materials off-site. Since the hospital has a rooftop helicopter landing pad, the hospital also has an emergency response plan in the event of a helicopter collision on site.

5.3.2.2 **Municipal Metering Pumps & Sewage Lift Station on Property owned by Hospital**

There are small metering pumps on this property where liquid chlorine is injected into water pumped from the water supply wells. Approximately 200 Liters of liquid chlorine are stored on site. This amount of chlorine is not a concern in Wellfield Protection Zone 4. Only bulk quantities of chlorine (approximately 750 Liters or more) would be of concern for possible spills and contamination of the groundwater. It is therefore prudent for the Town of Middleton Water Utility to remain aware of the potential risk posed by bulk chemical storage and continue to refrain from storing large quantities of chlorine at this site.

There is also a sewage lift station on this property in Wellfield Protection Zone 4. The lift station is used to pump sewage uphill from a low-lying area. This station has the potential to overflow during periods of high rainfall. Although microbes are not considered a contaminant in Zone 4, it is prudent for the Town of Middleton Water Utility to remain aware of the lift station location and

ensure its proper functioning. The lift station would pose a risk to the groundwater if there was a severe flood event that carried microbial contaminants from the overflow into Wellfield Protection Zones 1 or 2. Due to potential dilution of the contaminants and the catastrophic nature of such flooding that could bring additional contaminants in contact with the wells, the risk of contamination from the lift station is considered small.

5.3.3. Potential Risk: Fuel and Chemical Storage on Land Zoned Highway Commercial (HC)

The Town of Middleton By-Law Highway Commercial zone permits the following uses:

- Amusement Arcades
- Animal kennels and grooming
- Automobile trade activities including, but not restricted to the following:
 - Automobile dealership
 - Carwashes
 - Department of Transportation Depot
 - Gasoline stations
 - Motorcycle and accessory dealers.
 - Motor vehicle registry
 - Repair garages
 - School bus depot
 - Service stations
 - Transport garages
 - Vehicle weigh scales
- Bowling alleys
- Driver training schools
- Existing motels converted to apartment use.
- Funeral parlors
- Grocery stores and supermarkets
- High density residential developments (greater than 10 dwelling units/gross acre) in the Highway Commercial designation on properties abutting the west side of Brooklyn Street by Development Agreement
- Hobby shops and craft stores
- Hotels, motels, youth hostels
- Laundromats
- Marine craft and accessories
- Mobile home and travel-trailer sales and service
- Non-motorized commercial recreation uses.
- Public and private halls
- Recreational-trailer parks and laundromats and variety stores accessory thereto
- Restaurants
- Seed and agricultural merchants
- Service and utilities use.

- Single detached dwellings (1998 Civic Addressing Map, 157 Main Street, 151 Main Street, 147 Main Street, 145 Main Street, 139/141 Main Street, 115 Main Street, 111 Main Street, 43 Brooklyn Street, 33 Brooklyn Street, 9 Brooklyn Street, 16 Brooklyn Street)
- Take-out food outlets
- Taverns, beverage rooms and lounges
- Theatres
- Veterinary clinics

(Town of Middleton Land Use By-Law 2007, Section 13.1, page 37)

Currently the property zoned Highway Commercial in Zone 4 is the location of Middleton Physiotherapy & Osteopathy, (PID # 05267836, 474 Main Street). The current use poses no greater risk to the groundwater than residential uses in Zone 4. However, if the current or future property owners change the land use, there are uses permitted within the Highway Commercial zone that pose potential risk from chemicals leaching into the groundwater. Future potential land uses of concern in the HC zone include automobile trade activities, a laundromat/dry cleaner, mobile home and travel-trailer service, recreational-trailer parks and laundromats and variety stores accessory thereto, agricultural merchants, service and utilities uses, and any developments with large fuel or chemical storage.

6. Risk Assessment of Potential Sources of Contamination

Following the land use inventory, a risk analysis of identified potential sources of contamination was performed based on:

- Contaminant type
- Contaminant source
- Groundwater travel time (i.e. which zone is the potential contaminant within?)
- Short and long-term existing, potential and perceived consequences of impact.

The concerns identified in Table 6.0 are potential risks, and none of the sources pose an immediate threat to the Middleton Wellfield Protection Area. The identified potential risks will thus be addressed with equal priority in the Wellfield Protection Management Plan. Some of the potential sources of contamination currently exist, whereas others do not exist, but could in the future because they are currently allowed in the land use zoning. Strategies for managing the potential risk of groundwater contamination are discussed in detail in Section 7.

Table 6.0: Summary of Risk Analysis

**See Figure 5.2 for the location of the potential sources of contamination*

*Map Reference	Potential Sources of Contamination	WFPP Zone	Contamination Issue	Level of Risk Discussion
1	Agricultural use	3	Inorganic and organic chemical compounds	<ul style="list-style-type: none"> • Currently forested land • The concern is about future change to the land use because land is zoned agricultural. • In Zone 3, the concern about agricultural use is related to fuel storage and transfer as well as bulk storage of chemicals including pesticides and fertilizers. • Risk can be managed by restricting uses which pose a risk to groundwater. • The Town of Middleton purchasing the AG land in Zone 3 and requesting a rezoning of the purchased land to OS by the Annapolis County Council can provide a high level of protection.
2	Domestic Oil Tanks	4	Petroleum leaks and spills	<ul style="list-style-type: none"> • Concern is about management of potential risk from existing and future domestic oil tank leaks or spills in land zoned Residential Restricted. • Risk can be managed through public education.
3	Soldiers Memorial Hospital	4	Petroleum leaks and spills	<ul style="list-style-type: none"> • Concern is about management of potential risk from the hospital's existing large capacity oil tank leak or spill. • Soldiers Memorial Hospital is proactive about ensuring the tank meets all safety standards, has secondary containment and is currently improving

				<p>its Emergency Response Plan to include protocols for leaks or spills.</p> <ul style="list-style-type: none"> • Risk can be managed by continuing communication and cooperation between the Town of Middleton Water Utility and Soldiers Memorial Hospital.
4	Metering Pumps	4	Chlorine storage	<ul style="list-style-type: none"> • Currently the Town of Middleton Water Utility does not store bulk quantities of chlorine at this location. • Concern is about bulk storage of chemicals. • Risk can be managed by refraining from storing bulk quantities of chlorine at this location.
5	Sewage Lift Station	4	Microbial contaminants	<ul style="list-style-type: none"> • Concern is about management of potential risk associated with existing use. • Microbial contaminants are not a primary concern in Zone 4; however, it is prudent for the Town of Middleton Water Utility to be aware of potential risk in the case of a severe flood event that would move contaminants into a zone closer to the wellheads. • Risk can be managed through monitoring overflow. If overflow ever poses a risk to the groundwater, additional steps must be taken to remediate the situation and eliminate the risk.
6	Highway Commercial use	4	Inorganic and organic chemical compounds	<ul style="list-style-type: none"> • Current use as an art gallery and framing show poses little risk. • Concern is about future change to the land use. • In Zone 4, the concern about the Highway Commercial use is the allowance of activities involving or storage of dense non-aqueous phase liquids, fuel, chemicals, road salt and metals that may enter the groundwater. • Risk can be managed by restricting uses which pose a risk to groundwater. • Restrictions can be specified in the land use by-law.

7	Off Highway Vehicles	All	Petroleum leaks and spills	<ul style="list-style-type: none"> • Concern is the increased use of off highway vehicles and potential petroleum leaks. • Risk can be managed by restricting uses which pose a risk to groundwater. • Restrictions can be specified in the land use by-law.
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7. An Integrated Approach to Wellfield Protection Management

As discussed in Section 3, both the Town of Middleton and the County of Annapolis have been proactive about protecting the Town of Middleton Wellfield. The policies established and actions taken thus far provide a firm foundation to further strengthen groundwater protection. Land use planning is an important tool for protecting groundwater and balancing the development interests within the Middleton community and will be used as part of the Town of Middleton's comprehensive Source Water Protection Plan. Other tools, such as best management practices and public education, will be integrated alongside land use planning mechanisms.

Where risk analysis in Section 6 identified concern about future change to the land use, land use planning amendments will be the primary tool for reducing the risk of groundwater contamination. Where the identified concern is about management of potential risk associated with an existing use, other management tools will be the primary strategy for reducing the risk of groundwater contamination.

Strategy 7.1. Update Town of Middleton Municipal Planning Strategy Water Policy

Town of Middleton Council will update the Municipal Planning Strategy Water Policy to implement the land use planning recommendations in this management plan.

Town of Middleton Council Action Item 7.1.1

MPS Section 2.13 Water Policy states:

W2. Council shall investigate various methods or protection of the watershed area. The Town shall co-operate with the county to ensure the most beneficial and expedient method of protection of the watershed area.

Pursuant to policy W2, the Town of Middleton Council will accept the recommendations made in this Middleton Wellfield Protection Management Plan. The council shall undertake, as necessary, additional amendments to the MPS and LUB to institute wellfield protection measures.

Town of Middleton Council Action Item 7.1.2

Town of Middleton Council will add the Wellfield Protection Zones to all relevant zoning and land use maps in the Town of Middleton Municipal Planning Strategies and Land Use By-laws. Town Council will request the Annapolis County Council to add the Wellfield Protection Zones to all relevant maps in Annapolis County East End Area MPS and LUB.

Strategy 7.2. Apply a Hierarchy of Land Use Restrictions within the Wellfield Protection Area

Both the Town of Middleton and the Annapolis County Land Use By-Laws have policies stating that where the provisions of the By-Laws conflict with any other Municipal by-law, Provincial or federal regulation, the higher or more stringent regulations shall prevail (Annapolis County East End Area Land Use By-Law Section 7.1, page 26 and Town of Middleton Land Use By-Law Section 4.4.2, page 13).

Town of Middleton Council Action Item 7.2.1

In conformance with the Town of Middleton Land Use By-Law Section 4.4.2, Town Council will recognize that properties falling within the Wellfield Protection Zones are subject to more stringent land use restrictions and those restrictions will prevail when making land use decisions.

Annapolis County Council Action Item 7.2.2

Middleton Town Council will request Annapolis County Council to make a similar recognition pursuant to the Annapolis County East End Area Land Use By-Law Section 7.1.

Strategy 7.3. Retain Town of Middleton Ownership of Land

Land acquisition within the wellfield area enables a very high level of protection because a municipality can control land use, offer surveillance, and enforce rules and regulations that protect groundwater. As discussed in section 5.1, the Town of Middleton owns all of the land in Zones 1 and 2, and a significant amount in Zones 3 and 4. It is recommended that the Town of Middleton retain ownership of the land in Zones 1 and 2 in order to continue control over land use within close proximity to the wellheads. The Town may also consider purchasing additional land in Zones 3 and 4 as it becomes available to further enhance groundwater protection.

Town of Middleton Council Action Item 7.3.1

The Town of Middleton Council will commit to protecting the wellfield through land ownership. The Town will retain ownership of land in the Wellfield Protection Area and consider purchasing additional land in the area as it becomes available.

Strategy 7.4. Retain Current Zoning

The current zones in the Town of Middleton By-Law and the Annapolis County East End Area By-Law are for the most part consistent with protecting the wellfield.

Town of Middleton Council Action Item 7.4.1

Town Council shall commit to retaining the current zoning in the Middleton Wellfield Protection Area. If a change in zoning or land use is proposed, Council will only consider those uses which have equal or less potential to contaminate the groundwater than current zoning.

Annapolis County Council Action Item 7.4.2

The Town of Middleton Council will request that the Annapolis County Council retain the current zoning in the Middleton Wellfield Protection Area. If a change in zoning or land use is proposed, Annapolis County Council shall only consider those uses which have equal or less potential to contaminate the groundwater than current zoning.

Strategy 7.5. Address Potential Risk from Agricultural Use in Zone 3 By Negotiating Land Purchase and Rezoning.

As discussed in Sections 5.2.1 and 6, there is a portion of land zoned Agricultural that falls within Wellfield Protection Zone 3. Potential agricultural uses, such as storage or transfer of fuel and storage of chemicals including pesticides and fertilizers, on this site could pose a risk to the groundwater. It is recommended that the Town of Middleton enter into negotiation with the property owner of PID# 05196746 (Highway 201, Nictaux) to purchase the portion of this property that falls within Zone 3. This portion of land will then be rezoned from Agriculture Use (AG) to Open Space (OS). These measures will provide a high level of groundwater protection in Zone 3.

Middleton Town Council Action Item 7.5.1

The Town of Middleton Council will enter negotiation with the property owner of PID# 05196746 (Highway 201, Nictaux) to purchase the portion of this property that falls within Zone 3.

Annapolis County Council Action Item 7.5.2

Following the Town of Middleton's purchase this portion of PID# 05196746 (Highway 201, Nictaux), the Town of Middleton will request that the Annapolis County Council rezone this portion of land from Agriculture Use (AG) to Open Space (OS).

Strategy 7.6. Restrict Certain Highway Commercial Land Uses in Wellfield Protection Zone 4

As discussed in Sections 5.3.3 and 6, certain uses allowed in the Highway Commercial zone pose a potential risk to groundwater. The current use, Physiotherapy & Osteopathy, poses no greater risk to the groundwater than the surrounding residential uses. Concern is therefore about the potential risk posed by a future change in use.

It is recommended that property (PID# 05267836, 474 Main Street) zoned HC be subject to more stringent restrictions due to its location within Wellfield Protection Zone 4. It is recommended that the Town of Middleton Council continue to permit certain HC uses as of right. Land uses other than those explicitly permitted will only be considered by the development agreement. Gas stations, gas bars or any other facility offering service to automobiles, sales of gasoline, diesel fuel and lubricating oil will be explicitly prohibited and *not* considered by development.

agreement within the Wellfield Protection Area, including property (PID# 05267836, 474 Main Street) currently zoned Highway Commercial.

Town of Middleton Council Action Item 7.6.1

The Town of Middleton Council shall consider Highway Commercial uses other than those explicitly permitted in Wellfield Protection Zone 4 only by development agreement. Gas stations are prohibited and will not be considered by the development agreement. Council shall amend the Town of Middleton Municipal Planning Strategy to allow for this consideration in Section 3.6 Development Agreements, I13:

- (e): Change in use, to anything other than a permitted use listed, except gas stations, under Special Requirement 13.3.1 (a) in the Highway Commercial zone on property (PID# 05267836, 474 Main Street) which falls within the Middleton Wellfield Protection Zone 4.

Town of Middleton Council Action Item 7.6.2

Town of Middleton Council will amend the Land Use By-Law to include under Section 13.3 Special Requirements, a list of permitted HC uses for property (PID# 05267836, 474 Main Street), and a requirement that all other uses will only be considered by development agreement.

13.3.1 Special Requirement: Highway Commercial Uses in Wellfield Protection Zone 4

13.3.1 (a) The following uses are permitted as of right in the Highway Commercial zone on property (PID# 05267836, 474 Main Street) in Wellfield Protection Zone 4:

- Amusement Arcades
- Animal kennels and grooming
- Bowling Alleys
- Driver training schools
- Funeral parlors
- Grocery Stores and supermarkets
- Hobby shops and craft stores
- Hotels, motels and youth hostels
- Marine craft and accessories
- Non-motorized commercial recreation uses.
- Private and public halls
- Recreational-trailer parks and variety stores accessory thereto
- Restaurants
- Take out food outlets.
- Taverns, beverage rooms and lounges
- Theatres
- Veterinary clinics

(b) All other uses allowed in the Highway Commercial zone will only be considered by development agreement in the Highway Commercial zone on property (PID# 05267836, 474

Main Street) in Wellfield Protection Zone 4. Dry cleaners, gas stations, gas bars or any automotive trade or other facility offering service to automobiles, sales of gasoline, diesel fuel and lubricating oil are prohibited and shall *not* be considered by development agreement within the Wellfield Protection Area, including property (PID# 05267836, 474 Main Street) zoned Highway Commercial.

No development agreement proposal will be approved that would put the Town of Middleton's water supply at risk. When considering a development agreement proposal, Council shall have regard to the potential for increased risk of groundwater contamination through runoff containing toxic chemicals, including but not limited to detergents, solvents and petroleum products. Council may require the landowner to submit a management plan that includes details about the location, storage and/or handling of potential contaminants such as petroleum products and chemicals. Council will consider whether the landowner is carrying out best management practices regarding equipment maintenance, containment and cleanup of spills, chemical/automotive parts disposal, wastewater disposal, and minimizing use of toxic chemicals. Council may require the property owner to complete the Business Environmental Checklist in order to identify further opportunities for reducing pollutants that could impact the groundwater (https://www.gov.ns.ca/nse/pollutionprevention/docs/biz_checklist_factsheet.pdf).

Furthermore, Council may stipulate that the landowner have appropriate studies conducted by a qualified expert to assess the risk of impact on the quality and quantity of the groundwater before approving a development agreement.

Strategy 7.7. Cooperate with Soldiers Memorial Hospital to Ensure Protection of Groundwater in Zone 4

As discussed in sections 5.3.2.1 and 6, Soldiers Memorial Hospital has a large heating oil tank that poses a potential risk in the case of a leak or spill. The Hospital is being proactive about ensuring their tank has secondary containment and is developing specific protocols to deal with a potential spill or leak.

Town of Middleton Water Utility Action Item 7.7.1

The Town of Middleton Water Utility shall maintain a positive working relationship with the hospital to ensure that hospital administrators are aware of the hospital's proximity to the wellheads and its location within Zone 4 of the Wellfield Protection Area. The Town of Middleton Water Utility will continue to cooperate with the Annapolis Valley District Health Authority to ensure that their District Hazards Plan sufficiently considers groundwater protection in their policies and protocols regarding fuel and salt storage.

Strategy 7.8. Ensure that Sewage Lift Station Continues to Pose Little Risk to the Groundwater

As discussed in Sections 5.3.2.2 and 6, there is a sewage lift station that poses a low risk to groundwater contamination within Wellfield Protection Zone 4.

Town of Middleton Water Utility Action Item 7.8.1

The Town of Middleton Water Utility shall monitor the overflow from the Sewage Lift Station PS#4 located on the grounds of the Veteran’s Memorial Hospital (PID # 05077821, 462 Main Street) and take necessary actions to remediate the situation if it ever poses a risk to groundwater in Wellfield Protection Zone 4. The Water Utility will consider the impact overflow from the sewage lift station would have on the quality of groundwater in the event of a severe flood that may carry sewage into the more sensitive Wellfield Protection Zones 1 or 2. These considerations will be incorporated into the Contingency Plan.

Strategy 7.9. Ensure Security and Proper Maintenance of the Wellhead Site

There is a need to balance discouraging potentially harmful access to the wellheads and ensuring that the wellheads can be easily accessed by authorized maintenance personnel. Gating entrance to the wellhead maintenance road and erecting a fence around the wellheads will add a level of security to the groundwater at the most sensitive sites and indicate to the public that they are approaching a sensitive area. Regular maintenance of the wellhead sites will ensure that maintenance personnel can access the wellheads.

Town of Middleton Water Utility Action Item 7.9.1

The Town of Middleton Water Utility will ensure that the wellhead site is secure and properly maintained. A gate will be installed at the entry to the wellhead access road and fences installed around the wellheads. Water Utility staff will keep the site properly maintained and clear of any natural growth that would impede access to the wellheads. The Water Utility will investigate other options for ensuring the security of the wellfield as they become necessary, including but not limited to installing waterproof shelter for the wellheads and considering a security alarm system.

Strategy 7.10. Educate the Public about the Wellfield Protection Area

It is recommended that the Town of Middleton make efforts to communicate with all local area residents about the Wellfield Protection Management Plan.

Signs can assist in educating the public about the boundaries of the Wellfield Protection Zones and raise awareness about groundwater protection in general. Signage will be erected at locations where Wellfield Protection Area boundaries intersect with roads, informing people they are entering an important and sensitive area. The Town of Middleton Public Works Department may also determine it is appropriate to erect similar signs on the banks of the Annapolis or Nictaux Rivers at the boundaries of the Wellfield Protection Area, if there is any concern about people, who are unaware of the area’s sensitivity and importance, entering the area by water or riverbank. Signage will also be used to discourage entry to the wellhead site.

Town of Middleton Water Utility and Town Council Action Item 7.10.1

The Town shall make Middleton residents aware of the Source Water Protection Plan, including the boundaries of the Wellfield Protection Area and the strategies being undertaken to protect groundwater. The Town shall consider informing the public through means including but not limited to:

- a public open house,
- semi-permanent displays and/or take-home printed fact sheets at grocery stores, churches and public facilities like the Middleton and District Arena and the Rosa M. Harvey Middleton & Area Library,
- mail out of information flyers or booklets,
- information posted on the Town's website,
- advertisement in the local newspaper.

Town of Middleton Council Action Item 7.10.2

Since the Middleton Source Water Protection Plan necessitates certain amendments to the Town of Middleton MPS and LUB, Town Council will arrange a Public Hearing pursuant to MPS Section 3.5, Policy I12 and in accordance with the provisions of the *Municipal Government Act*.

Annapolis County Council Action Item 7.10.3

Since the Middleton Source Water Protection Plan necessitates certain amendments to the County of Annapolis LUB, Annapolis County Council will inform the public according to County policies on public participation outlined in the Annapolis County East End Area MPS Section 9.8 Public Participation Program.

Town of Middleton Water Utility Action Item 7.10.4

The Town of Middleton Water Utility will erect signs at the entrance to the wellhead maintenance road indicating entry to a Wellfield Protection Area. The Public Works Department will also investigate other appropriate locations to erect signs to inform the public about the sensitivity and importance of the Wellfield Protection Area they are about to enter.

Strategy 7.11. Educate Residents within the Wellfield Protection Area about Potential Domestic Contaminants

Domestic oil tanks are a potential risk in Wellfield Zone 4, as identified in Sections 5.3.1 and 6. Residents within the Wellfield Protection Area can become groundwater stewards with assistance and information from the Town of Middleton. It is recommended that the Town inform residents within the Wellfield Protection Area about potential sources of risk to groundwater on their properties such as oil tanks, private wells, septic systems, pesticide use on home gardens, and storage of fuel and other chemicals.

Town of Middleton Water Utility Action Item 7.11.1

The Town of Middleton Water Utility will survey all existing functional, abandoned and closed wells within the Wellfield Protection Area. If any concerns arise from conducting this survey, such as storage of fuel near a functioning private well or an improperly closed well, the Utility will inform property owners and work with them to mitigate the risk to the groundwater resource.

Town of Middleton Water Utility Action Item 7.11.2

The Town of Middleton Water Utility will send a letter to all residents within the Wellfield Protection Area informing them of the Wellfield Protection Area boundaries, as shown on an easily discernable map. This letter will emphasize the importance of groundwater protection and the increased sensitivities of each Wellfield Protection Zone. Residents will be informed about the risk associated with potential domestic contaminants and encouraged to implement best management practices.

Proper maintenance and monitoring of domestic oil tanks will be highlighted as something that property owners need to be aware of to protect the overall groundwater resource.

The Town of Middleton Water Utility will describe how private wells are direct conduits to the overall groundwater resource and will recommend best practices to ensure that no contaminants are entering the groundwater via private wells. Residents will also be advised on the proper closure of wells no longer in use.

Residents will be directed to best management practices described in NSECC publications including, but not limited to:

- On-site sewage disposal (septic systems)
- A Homeowners Guide to Oil Tank Safety
- Home Garden Pest Control
- Composting Yard Trimmings and Leaves (Waste Reduction Fact Sheet)
- Sustainable Gardening
- Pollution Prevention: At Work and at Home
- Before You Construct a Water Well
- A Guide for Private Well Owners

(These publications and others that may be useful for guiding residents towards best management practices can be found on the NSECC website: <http://www.gov.ns.ca/nse/pubs/>)

The Town of Middleton Water Utility will make staff available to answer inquiries from homeowners working towards groundwater protection measures.

8. Contingency Plan

The Town of Middleton Water Utility has developed a full contingency plan for the town's water supply. The contingency plan addresses operational issues, including equipment or power failure, as well as groundwater protection issues including procedures for the rapid mitigation of environmental accidents, such as a hazardous substance spill, which would constitute a water supply emergency. The Town of Middleton Water Utility will inform emergency responders about the Wellfield Protection Area and indicate that the Utility needs to be contacted immediately in the case of a hazardous substance spill within the area. The Town of Middleton Water Utility has developed alternative sources of water and means of distributing safe drinking water to residents. Furthermore, the Utility has a plan for communicating with residents who rely on the public water source about a water emergency, including boil water advisories. According to NSECC's guidelines for developing a source water protection management plan, the contingency plan includes:

- General procedures for routine emergencies or major emergencies within a water supply area
- A procedure for equipment becoming inoperable in a major emergency and/or due to power failure.
- A procedure for dealing with spills or releases.
- An alternative water source
- A plan for isolating affected areas and distributing water from unaffected areas.
- Communicating with residents about reducing water use and the provision of bottled water if that will be made available during an emergency.
- A boil water advisory procedure
- Facility-specific information on the hazardous material stored or transported in the source water area.
- Provision for annual review and update by the utility.

9. Monitoring Program to Evaluate the Effectiveness of the Town of Middleton Wellfield Protection Plan

According to NSECC's guidelines for developing a source water protection management plan, municipalities must develop a monitoring program to evaluate the effectiveness of the protection plan. The Town of Middleton Water has laid out a full monitoring program. The Monitoring Plan will help the Town of Middleton Water Utility determine how effectively the Town of Middleton Source Water Protection Plan is being implemented as well as how effectively the quality and quantity of the groundwater is being protected.

As per the Guidelines for Monitoring Public Drinking Water Supplies and the Nova Scotia Treatment Standards for Municipal Drinking Water Systems the Town of Middleton Water Utility conducts bacteriological tests and monitors chlorine levels at the extremities of the system once per week and annually at the wellheads. Quarterly sampling is conducted for the Corrosion Control Program, which includes sampling for pH, Alkalinity, Conductivity, Temperature, and Free Chlorine Residual at 5 sample sites. A sampling program for THM and HAA content that conforms to the standards set out for the operation of a Water Utility. A Copper and Lead Annual Monitoring Plan where samples are collected annually at 10 residence homes. Twice per year there are full Standard Water analysis + total metals conducted of the individual production wells to ensure the quality of the raw water supplied to the Water Utility infrastructure. As per the guidelines set forth by NSECC, every 2 years raw water samples are taken from the wellheads and tested as per the Guidelines for Monitoring Public Drinking Water Supplies. And finally, every 5 years the wellheads raw water is tested for all health-related parameters in the Guidelines for Canadian Drinking Water Quality (latest version).

The Town of Middleton Water Utility uses a SCADA software monitoring system, which has given the utility a sophisticated tool for monitoring the groundwater supply and treated water quality. This system of continuously monitoring essential water quality criteria combined with the routine water sampling procedures ensures the highest standards of water quality.

The Town of Middleton's Water Utility Monitoring Plan:

- Confirms the parameters to be measured.
- Confirms the locations and frequency of sampling.
- Establishes baseline data.
- Records results and determines if conditions are satisfactory and/or changing.
- Uses water quantity measurements to aid in evaluation of the protection plan.
 - For example, if the water quantity in Middleton were to decrease dramatically, the risk of contamination could increase. Therefore, water quantity data can also inform the protection of water quality.

In addition to the SCADA computer monitoring system, The Town of Middleton Water Utility conducts weekly visual inspections of the wellhead sites to ensure there are no potential contaminant sources. The Water Utility also conducts once per month visual inspections of the potential sources of contaminants identified in Sections 5 & 6 to ensure that property owners are not compromising groundwater quality.

The Water Utility uses the water quality and quantity information provided by the SCADA monitoring system and visual inspections to determine whether the Wellfield Protection Management Plan is effective at enabling satisfactory water quality results. The results of the water quality monitoring program and visual inspections may indicate poor quality, and that land use practices could be changed to increase water protection. In such a case, the Town of Middleton Water Utility in conjunction with the Town of Middleton and Annapolis County councils will alter the Source Water Protection Plan accordingly until results are satisfactory. Following any alteration of the Protection Plan, the Water Utility will continue monitoring water quality and assessing whether the Protection Plan is succeeding at protecting groundwater. In addition, the Town of Middleton Source Water Protection Plan will be reviewed as part of the Town of Middleton and County of Annapolis East End Area municipal planning strategy periodic reviews. The Water Utility will provide input on whether the Plan is succeeding from a water quality and quantity perspective.

Town of Middleton Water Utility Action Item 9.1

The Town of Middleton Water Utility will develop a Monitoring Plan, incorporating data provided by the SCADA monitoring system as one tool to determine the effectiveness of Source Water Protection Plan.

Town of Middleton Water Utility Action Item 9.2

As part of the monitoring program, the Town of Middleton Water Utility will conduct weekly visual inspections of the wellhead site and monthly inspections of the Wellfield Protection Area to identify any new sources of potential contamination or increased risk of contamination from known potential contaminant sources.

Town of Middleton Source Water Protection Advisory Committee Action Item 9.3

The Town of Middleton Water Utility will establish a Source Water Protection Advisory Committee. The Source Water Protection Advisory Committee will be established and will operate according to NSECC's "Developing a Municipal Source Water Protection Plan: A Guide for Water Utilities and Municipalities, Step 1: Form a Source Water Protection Advisory Committee". The Committee will establish goals and objectives including providing advice to the Middleton Town Council and the Town of Middleton Water Utility on matters related to land use issues and water quality. The Committee will set out terms of reference in consultation with the municipality and the utility and be officially recognized by Middleton Town Council. As outlined by NSECC, the committee will meet as necessary, but no less than three times per year. The committee must prepare an annual report of its activities to be distributed to all organizations and individuals represented on the committee and to other interested parties. The committee will conduct annual reviews of the Source Water Protection Plan, Contingency Plan and Monitoring Plan to ensure that action items are being implemented and to recommend any changes to the plan as required.

Town of Middleton Council in conjunction with the Town of Middleton Water Utility and the Annapolis County Council Action Item 9.4

The Town of Middleton Source Water Protection Plan will be reviewed as part of the periodic reviews of the Town and County Municipal Planning Strategy Reviews. The Town of Middleton reviews its MPS as needed, generally within 10 years from the date of its latest adoption. The Annapolis County East End Area Municipal Planning Strategy is reviewed as needed, or within 5 years of its latest adoption. The Town of Middleton Water Utility and the Middleton Source Water Protection Advisory Committee will participate in the review of the Source Water Protection Plan and all parties will work together to develop strategies to address new concerns that arise during the periodic reviews. If land use concerns arise prior to a periodic review, Councils will conduct an early review of the Source Water Protection Plan and will work with the Water Utility and the Advisory Committee to develop solutions that will ensure the protection of the groundwater supply.

Town of Middleton Water Utility with the Middleton Source Water Protection Advisory Committee Action Item 9.5

The Town of Middleton Water Utility will conduct a full update of the Monitoring Program every 5 years. The Middleton Source Water Protection Advisory Committee will participate in the five-year Monitoring Plan update. The five-year updates of the Monitoring Plan will be timed to coincide with the reviews of the Source Water Protection Plan, the Annapolis County East End Area MPS and LUB review. Changes in the Monitoring Plan, the Source Water Protection Plan and any required MPS or LUB amendments can therefore all be made within the same review period.

10. Wellfield Protection Implementation Plan

Table 8.1: Implementation of the Town of Middleton Wellfield Protection Plan

Action Item	Management Strategy	Responsibility	Timeframe
7.1.1	Update Town of Middleton MPS Water Policy	Town of Middleton Council	By December 2009
7.1.2	Update Town of Middleton MPS Water Policy	Town of Middleton Council	By December 2009
7.2.1	Apply a Hierarchy of Land Use Restrictions within the Wellfield Protection Area	Town of Middleton Council	By December 2009
7.2.2	Apply a Hierarchy of Land Use Restrictions within the Wellfield Protection Area	Annapolis County Council	By December 2009
7.3.1	Retain Town of Middleton ownership of land	Town of Middleton	Ongoing
7.4.1	Retain Current Zoning	Town of Middleton	Ongoing
7.4.2	Retain Current Zoning	Annapolis County Council	Ongoing
7.5.1	Enter negotiations with owner of PID# 05196746 (Highway 201, Nictaux) to purchase the portion of this property that falls within Wellfield Protection Zone 3.	Town of Middleton	2009/2010 fiscal year
7.5.2	Rezone the portion of PID# 05196746 (Highway 201, Nictaux) purchased by the Town of Middleton to Open Space (OS)	Annapolis County Council	By December 2010
7.6.1	Amend MPS to consider by development agreement proposals for a change in use to anything other than the list of permitted uses on PID# 05267836, 474 Main Street, in the Highway Commercial zone that falls within Wellfield Protection Zone 4.	Town of Middleton Council	By December 2009
7.6.2	Amend LUB to permit listed uses and only consider by development agreement other uses on PID# 05267836, 474 Main Street, in the Highway Commercial zone that falls within Wellfield Protection Zone 4.	Town of Middleton Council	By December 2009
7.7.1	Cooperate with Soldiers Memorial Hospital to Ensure Protection of groundwater in Zone 4	Town of Middleton Council	Ongoing
7.8.1	Ensure that Sewage Lift Station poses little risk to the groundwater	Town of Middleton Water Utility	Ongoing
7.9.1	Ensure Security and Proper Maintenance of the Wellhead site	Town of Middleton Water Utility	2023 Quotes obtained, 2025 Budget item
7.10.1	Educate the Public about the Wellfield Protection Area – <i>Meetings & Information</i>	Town of Middleton Council & Water Utility	2009/2010 fiscal year
7.10.2	Educate the Public about the Wellfield Protection Area – <i>Public Hearing</i>	Town of Middleton Council	2009/2010 fiscal year
7.10.3	Educate the Public about the Wellfield	Annapolis County	2009/2010 fiscal year

Action Item	Management Strategy	Responsibility	Timeframe
	Protection Area - <i>Public Hearing</i>	Council	
7.10.4	Educate the Public about the Wellfield Protection Area – <i>Signage</i>	Town of Middleton Water Utility	Completed
7.11.1	Survey all existing functional, abandoned and closed wells	Town of Middleton Water Utility	June 2025
7.11.2	Educate Residents within the Wellfield Protection Area about Potential Domestic Contaminants	Town of Middleton Water Utility	Ongoing, Educational pamphlets created
8.11	Develop a full contingency plan for the wellfield area	Town of Middleton Water Utility	Ongoing and Updated 2024
9.11	Monitoring Program: Develop Monitoring Plan to monitor water quality and assess Source Water Protection Plan	Town of Middleton Water Utility	Completed Dec 2024. Ongoing with SWPP updates
9.2	Monitoring Program: Visual Inspection of wellheads and Wellfield Protection Area	Town of Middleton Water Utility	Ongoing, weekly/monthly
9.3	Monitoring Program: Establish a Middleton Source Water Protection Advisory Committee, which provides recommendations, and an annual review of the Source Water Protection Plan, Contingency Plan, and Monitoring Plan.	Middleton Source Water Protection Advisory Committee	Ongoing. Meet 4 times/ year. Conduct Annual Reviews.
9.4	Monitoring Program: Review of Source Water Protection Plan at the same time as the Town and County MPS periodic reviews	Town of Middleton, Annapolis County Council, Town of Middleton Water Utility & Middleton Source Water Protection Advisory Committee	At periodic reviews of Town and County East End Area Municipal Planning Strategies
9.5	Monitoring Program: Update Monitoring Plan	Town of Middleton Water Utility & Middleton Source Water Protection Advisory Committee	Every 5 years from the adoption of the Monitoring Plan. Timed to coincide with the periodic reviews of County and Town MPSs and LUBs, and the review of the Wellfield Protection Management Plan

Appendix A

Appendix A

Property Owners in the Middleton Wellfield Protection Area (10 May 2023)

Property Owner	PID	Civic Address	Mailing Address
Gordon Brown, Donna Noble-Brown	05030440	Highway 1, Wilmot	PO BOX 1247
William & Julie Forest	05077995	22 Acadia Street	PO BOX 447
Mark MacFadyen	05078019	30 Acadia Street	PO BOX 1313
Brian David Smith & Patricia Wendy May	05078001	26 Acadia Street	PO BOX 74
Town of Middleton	05077987	Acadia Street	
Cornelia Schoonhoven	05077979	16 Acadia Street	PO BOX 113
Nancy Vandommelen & Mark Bazinet	05077961	12 Acadia Street	PO BOX 804
Douglas J. Hessler & Phyllis L. Coops	05077953	8 Acadia Street	PO BOX 851
Sherri Lee Blackburn	05077946	6 Acadia Street	PO BOX 1188
William Van Dam	05077938	4 Acadia Street	269 Victoria St., Inverhuron, ON N0G 2T0
Brent Allan Adams	05077920	2 Acadia Street	PO BOX 461
Earl Johnson	05077870	15 Acadia Street	PO BOX 866
Darren Leslie & Cecilia Mary Hicks	05077896	9 Acadia Street	
Lester & Sheila Isabel Collins	05267844	1 Acadia Street	PO BOX 1565
James and Roxanne Lasko	05267851	3 Acadia Street	PO BOX 1334
Negar Kashani	05077904	5 Acadia Street	1648 Maple St., Kingston B0P 1R0
Stillpoint Properties Limited	05267836	474 Main Street	283 Grant Rd., Paradise B0S 1R0
Sandra Marie Wharry	05077847	476 Main Street	3058 Hwy 221, Aylesford B0P 1C0
Annapolis Valley District Health Authority	05077821	462 Main Street	15 Chipman Dr., Kentville B4N 3V7
Mary Harvey	5079611	10 Ross Lane	PO BOX 307
Graham A. Hood & Rosa Maria Calderon-Ortiz	5077813	6 Ross Lane	PO BOX 148
R. Bryson and Ingrid Crowell	05079603	2 Ross Lane	PO BOX 906
R. Bryson and Ingrid Crowell	05213509	Jones Avenue	PO BOX 906
Ronald G. & Paula Jean Wallis	05079470	6 Riverside Drive	PO BOX 1372
Town of Middleton	05075809	Riverside Drive, Nictaux	
Frederick William Roch	05196746	Highway 201, Nictaux	PO BOX 209
Frederick and Anna Roch	05216098	Oakhurst Road, Nictaux	PO BOX 209
Town of Middleton	05187836	Highway 1, Nictaux	

Property Owner	PID	Civic Address	Mailing Address
Town of Middleton	05182951 * PW1	Highway 1, Nictaux	
Town of Middleton	05180187 *PW2&PW3	Highway 10, Nictaux	
Lee & Gayle Ann Armstrong	05075791	Highway 10, Nictaux	31 Greenhouse Rd., Nictaux BOS 1P0
James and Heike Landry	05075668	Highway 10, Nictaux	85 Greenhouse Rd., Nictaux
James and Heike Landry	05185863	85 Greenhouse Road, Nictaux	

Appendix B
Terms Of Reference

TOWN OF MIDDLETON CODE A – GENERAL ADMINISTRATION	
Subject: Source Water Protection Advisory Committee Terms of Reference	Number: 3.10
Coverage: Council, Staff & Public	Approved by: Council
Effective Date: January 21, 2019	Revision Date:

1. Objective

The purpose of the Source Water Protection Advisory Committee is to provide a forum for the Landowners, the Town of Middleton and other Stakeholders to work cooperatively to maintain the water quality and quantity of the Town of Middleton's water supply. The Committee recognizes that the protection of source water is the first step in the multi-barrier approach to clean, safe drinking water.

The Source Water Protection Advisory Committee is established in response to the need to develop a Source Water Protection Plan. The Committee will report to the Middleton Town Council and is recognized by the Town of Middleton, Municipality of the County of Annapolis and the Town of Middleton Water Utility.

2. Definitions

- 2.1 **Committee** means the Source Water Protection Advisory Committee.
- 2.2 **County** means the County of Annapolis.
- 2.3 **Protected Water Area** means an area surrounding a source of drinking water as a protected water area, designed under the Environment Act by the Minister of Environment. Regulations for a PWA can only be developed in the context of Section 106 of the Environment Act. Lily Lake is a Protected Water Area.
- 2.4 **SWP Areas** means the portion of the source water supply area that will be covered by the source water protection plan – this includes the wellfield and Lily Lake.
- 2.5 **Town** means the Town of Middleton.

3. Membership

- 3.1. The Committee will consist of:
 - Three (3) Landowner representatives – two (2) residing in the Town, one (1) residing in the County, preferably owning land within the SWP areas;
 - Two (2) Councillors, Town and Town Water Utility;
 - One (1) Councillor, County;

Non-voting members:

- Chief Administrative Officer;
- Director of Public Works, Town;
- Planner, Town;
- Planner, County;
- Representative of NS Department of Environment;
- Other resources as needed, NS Lands and Forestry, NS Transportation, NS Agriculture, etc.

- 3.2 Applications for appointment to the Committee shall be invited by public advertisement.
- 3.3 The Chair and the Vice-Chair of the Committee are appointed annually by the membership at the meeting closest to January 1st.

4. Qualifications

- 4.1. Any member of the Committee is eligible for reappointment.
- 4.2. Any member of the Committee, who is absent from three consecutive meetings of the Committee, forfeits office, unless the absence is caused by illness or is authorized by resolution of the Committee and noted in the Committee minutes. Any member who so forfeits office is eligible for reappointment following the remainder of the unexpired term.

5. Mandate

The Committee has the following responsibilities:

- 5.1. Assist in the development and implementation of a Source Water Protection Plan, which will be reviewed periodically.
- 5.2. Provide the Town, County and Utility with recommendations on matters concerning land-use issues, as well as water quality, levels and flows in the SWP areas.
- 5.3. Assist with revisions of the regulations for the Protected Water Area as required.
- 5.4. Review and make recommendations on activities affecting the SWP areas, as requested by the Town.
- 5.5. Provide and develop information and education about the SWP areas for local residents, landowners and users of the SWP areas.
- 5.6. Provide a forum to deal with issues and concerns in the SWP areas. The Committee will address problems and solutions on matters of concern, as they arise.
- 5.7. Advice on forest matters and other land use issues.

- 5.8. Develop Best Management Practices for activities in the SWP areas. These Best Management Practices will also be used to guide any approval processes for activities.
- 5.9. Liaise with government agencies and other resources not represented on the Committee on matters affecting the SWP areas, such as NS Agriculture, NS Lands and Forestry, NS Transportation, and the federal Department of Fisheries and Oceans.
- 5.10. To provide information on Committee activities to landowners in the SWP areas.

6. Rules of Engagement

- 6.1. The Committee will endeavour to conduct business by consensus. The Chair may put the matter to a vote if they deem that a consensus is not achievable.
- 6.2. A quorum consists of a majority of members of the Committee.
- 6.3. The Committee will meet as necessary, but no less than three (3) times a year.

7. Members' Roles

7.1. Landowners

The landowners are responsible for having representation on the SWP Advisory Committee. They are in a unique position of knowing the SWP areas and their land, in addition to their own and their neighbours' land use practices. The landowners are encouraged to express their concerns and interests; advise and provide information to the Committee on land use management and source water protection; communicate with other landowners on Committee activities and report any problems that they may encounter with the SWP areas.

7.2. Town Councillors

It is the responsibility of the Councillors to represent the interests of the citizens served by the Town's Water Utility and the Town Council. The Councillors will also represent the Town's interests as a landowner in the SWP areas.

7.3. County Councillor

It is the responsibility of the Council to represent the interests of the citizens served by the Town's Water Utility, the SWP areas landowners, and the County Council.

7.4. Town Staff

Town staff will report to the Committee on activities undertaken by the Town and the County and any approvals in the SWP areas. Staff will work with the Committee providing information and advising on topics relating to source water protection, watershed management, land use and the operation of the Town's Water Utility. Staff will also bring forth concerns relating to water quality and management.

7.5. Department of Environment

The NS Environment representative will work with the Committee providing information and advising on topics related to source water protection, watershed management, the Environment Act and Protected Water Area Regulations.

K. Certification

I, Jennifer Boyd, Town Clerk of the Town of Middleton, do hereby certify that the policy, of which the foregoing is a true copy, was duly passed at a duly called meeting of the Town Council of the Town of Middleton held on the 21st day of January 2019.

GIVEN under the hand of the Town Clerk and the corporate seal of the Town of Middleton this 31st day of January 2019.


Jennifer Boyd
Town Clerk

27 February 2025

Source Water Protection Plan Addendum

The Town of Middleton's Wellfield Protection Management Plan submitted in 2009 to NSECC was never accepted or approved. As per the Town's Approval from NSECC a Source Water Protection Plan (SWPP) has been created from the original Wellfield Protection Management Plan document in 2024 which has been reviewed and accepted by the Source Water Protection Advisory Committee. The newly created SWPP has been submitted as of 3 February 2025 to NSECC and has been accepted by NSECC as of the 25th of February 2025.

Included in the SWPP is a monitoring plan that follows the current Guidelines for Monitoring Public Drinking Water Supplies and the Nova Scotia Treatment Standards for Municipal Drinking Water Systems with no added sampling criteria based on sample results from the 2019 GCDWQ from well heads. In addition, the Annual Sampling Plan submitted to NSECC covers all the basis for the sampling requirements within the Town's water utility and its source water.

The Source Water Protection Advisory Committee (SWPAC) did not hold meetings between 2019 through to 2022 due to COVID restrictions. During 2023 the SWPAC met 3 times and twice in 2024 to review, update and address outstanding management strategies. These meetings were held on 24 April, 10 July, and 23 October 2023. Meetings were also held in 2024 on 10 June, 22 July, & did not meet quorum on 15 Oct. The next meeting of the SWPAC is scheduled for 5 March 2025. The approved minutes from these meetings are included.

All SOP and CP's have been reviewed and updated in 2024 to align with current operational requirements and working circumstances regarding the Wellfield and Water Utility Operations.

- **Wellfield Protection Implementation Plan**

Table 8.1: Implementation of the Town of Middleton Wellfield Protection Plan

Action Item	Management Strategy	Responsibility	Timeframe
7.1.1	Update Town of Middleton MPS Water Policy	Town of Middleton Council	By December 2009
7.1.2	Update Town of Middleton MPS Water Policy	Town of Middleton Council	By December 2009
7.2.1	Apply a Hierarchy of Land Use Restrictions within the Wellfield Protection Area	Town of Middleton Council	By January 2026
7.2.2	Apply a Hierarchy of Land Use Restrictions within the Wellfield Protection Area	Annapolis County Council	By January 2026
7.3.1	Retain Town of Middleton ownership of land	Town of Middleton	Ongoing
7.4.1	Retain Current Zoning	Town of Middleton	Ongoing
7.4.2	Retain Current Zoning	Annapolis County Council	Ongoing
7.5.1	Enter negotiations with owner of PID# 05196746 (Highway 201, Nictaux) to purchase the portion of this property that falls within Wellfield Protection Zone 3.	Town of Middleton	Awaiting Update from Town Hall
7.5.2	Rezone the portion of PID# 05196746 (Highway 201, Nictaux) purchased by the Town of Middleton to Open Space (OS)	Annapolis County Council	Awaiting Update from Town Hall
7.6.1	Amend MPS to consider by development agreement proposals for a change in use to anything other than the list of permitted uses on PID# 05267836, 474 Main Street, in the Highway Commercial zone that falls within Wellfield Protection Zone 4.	Town of Middleton Council	Awaiting Update from Town Hall
7.6.2	Amend LUB to permit listed uses and only consider by development agreement other uses on PID# 05267836, 474 Main Street, in the Highway Commercial zone that falls within Wellfield Protection Zone 4.	Town of Middleton Council	Awaiting Update from Town Hall
7.7.1	Cooperate with Soldiers Memorial Hospital to Ensure Protection of groundwater in Zone 4	Town of Middleton Council	Ongoing
7.8.1	Ensure that Sewage Lift Station poses little risk to the groundwater	Town of Middleton Water Utility	Ongoing
7.9.1	Ensure Security and Proper Maintenance of the Wellhead site	Town of Middleton Water Utility	2023 Quotes obtained, 2025 Budget item
7.10.1	Educate the Public about the Wellfield Protection Area – <i>Meetings & Information</i>	Town of Middleton Council & Water Utility	Ongoing
7.10.2	Educate the Public about the Wellfield Protection Area – <i>Public Hearing</i>	Town of Middleton Council	Ongoing
7.10.3	Educate the Public about the Wellfield	Annapolis County	Ongoing

Action Item	Management Strategy	Responsibility	Timeframe
	Protection Area - <i>Public Hearing</i>	Council	
7.10.4	Educate the Public about the Wellfield Protection Area – <i>Signage</i>	Town of Middleton Water Utility	Completed
7.11.1	Survey all existing functional, abandoned and closed wells	Town of Middleton Water Utility	June 2025
7.11.2	Educate Residents within the Wellfield Protection Area about Potential Domestic Contaminants	Town of Middleton Water Utility	Ongoing, Educational pamphlets created
8.11	Develop a full contingency plan for the wellfield area	Town of Middleton Water Utility	Ongoing and Updated 2024
9.11	Monitoring Program: Develop Monitoring Plan to monitor water quality and assess Source Water Protection Plan	Town of Middleton Water Utility	Completed Dec 2024. Ongoing with SWPP updates
9.2	Monitoring Program: Visual Inspection of Wellheads and Wellfield Protection Area	Town of Middleton Water Utility	Ongoing, weekly/monthly
9.3	Monitoring Program: Establish a Middleton Source Water Protection Advisory Committee, which provides recommendations, and an annual review of the Source Water Protection Plan, Contingency Plan and Monitoring Plan.	Middleton Source Water Protection Advisory Committee	Ongoing. Meet 4 times/ year. Conduct Annual Reviews.
9.4	Monitoring Program: Review of Source Water Protection Plan at the same time as the Town and County MPS periodic reviews	Town of Middleton, Annapolis County Council, Town of Middleton Water Utility & Middleton Source Water Protection Advisory Committee	At periodic reviews of Town and County East End Area Municipal Planning Strategies
9.5	Monitoring Program: Update Monitoring Plan	Town of Middleton Water Utility & Middleton Source Water Protection Advisory Committee	Every 5 years from the adoption of the Monitoring Plan. Timed to coincide with the periodic reviews of County and Town MPSs and LUBs, and the review of Source Water Protection Plan

SWPP Meeting Minutes for 2023 - 2024

SOURCE WATER PROTECTION ADVISORY COMMITTEE

Wednesday, April 24, 2023

A meeting of the Source Water Protection Advisory Committee was held at the Town Hall on Wednesday, April 24, 2023, starting at 6:00 p.m.

PRESENT

Councillors Bernadette Knapp and Chad LeBlanc; Chief Administrative Officer, Ashley Crocker; Public Works Water Operator Jeff Hurlburt; Town of Middleton Citizen Representative, Brenda Ford; NS Environment and Climate Change Representative, Mike Allen; County of Annapolis Resident Representative Fred Roch; Recording Secretary, Susan Purcell.

Regrets: Regional Director of Public Works, Dan Wade
Town of Middleton Citizen Representative, Ronald Brown (will attend next meeting)

1. CALL TO ORDER

CAO Crocker called the meeting to order at 6:00 p.m.

There has been a pause of three years since the last committee meeting in November 27, 2019. There was an introduction of all members and attendees.

2. APPROVAL OF AGENDA

230501.01: It was moved and seconded that the agenda be approved as amended. Motion carried.

3. APPOINTMENT OF CHAIR AND VICE CHAIR (ANNUAL)

230502.02: It was moved and seconded to appoint a Chair and Vice Chair to the Source Water Protection Advisory Committee. Motion carried.

230502.03: It was moved and seconded to appoint Councillor Chad LeBlanc as the Source Water Protection Advisory Committee Chair. Motion Carried.

230503.04: It was moved and seconded to appoint Fred Roch as the Source Water Protection Advisory Committee Vice Chair. Motion carried.

4. OLD BUSINESS

a. Posting Signage and Enforcement

- There are currently no fishing or trespassing signs at Lily Lake.
- The wellfield area across the river from the Hospital parking lot should have signage. The wellfield is not legally protected. Other municipalities employ different strategies with respect to fire suppression, education, and awareness.

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Wednesday, April 24, 2023

- Water Operator, Jeff Hurlburt, commented that there is an information package that should be sent out to staff and possibly residents regarding the Lily Lake area.
- Department of Environment and Climate Change Representative, Mike Allen, will follow up with the Department of Environment to see if they can provide feedback in a living document.
- CAO Crocker mentioned that the Regional Director of Public Works, Dan Wade, has been actioned to investigate the state of the pipes and valves at Lily Lake. Councillor Knapp suggested that citizen representative, Mr. Ron Brown, is a plumber and may be able to offer advice.
- The backup water supply typically would be a portable water supplier or non-potable source like Lily Lake which would mean bulk water being brought into Town.
- Need to obtain a copy of the most recent maps. Need Final Report - Middleton Wellfield Protection Management Plan from CBCL.

b. Action Items – Review Priorities

1. Secondary water Source. Have learned from the Department of Environment that Lily Lake as a secondary water source isn't an option. There does need to be a temporary short-term plan for the supply of water in place in case of emergencies.
2. Inform the public. An information sheet can be sent out in the September water bills about the importance of the wellfield protection as well as reducing water usage and the Town's boil order advisory procedures.
3. Identify any changes in risks inside the wellfield zones.
4. Create a procedure for dealing with spills or releases.
5. Create a procedure for equipment becoming inoperable for emergencies and/or due to power failure.

5. RESERVOIR AND WELLFIELD UPDATE

- The reservoir is operating at less than half capacity.
- The Town was hopeful that a grant would come in to offset the cost of the reservoir. Received an answer from the Province that the Town would not receive that grant.
- The reservoir regulates the pressure in the lines in the water system all across Town. It provides back up water for the fire department, as well to residents during an emergency or power outage because of gravity, which will push the water down through the system. It is not operating at full capacity and the Fire Department can only draw from hydrants for 45 minutes before the water level reduces to a boil water order.
- A presentation on the Reservoir was presented to Council.
- CAO Crocker sent the presentation to Municipal Affairs.
- There is a Reservoir design, we have bought land, and require more funding.
- Provincial representatives have looked at the Reservoir. Were told that ICIP program will be replaced by something else. Suggested looking at Disaster Mitigation Fund; unsure if we can make a case to qualify.
- If the Reservoir did fail, there would be no water to the Town, including schools and hospital. We require an emergency action plan.

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Wednesday, April 24, 2023

- Director of Public Works, Dan Wade, has met with our REMO Coordinator, Brian Orde, to address our Emergency Action Plan for the reservoir.
- Engineers are worried that because the Reservoir has been leaking, that there is soil erosion, and that the entire foundation could let go.
- The Town has a plan and drawings and could have a tender out in a month; however, there is no funding to do it. In the meantime, staff are working on it. On March 31st, 2023, the Province gave the Town over \$320,000. The finance staff have been actioned to go back and calculate each year to determine what was collected from rate payers for the reservoir. That money will get set aside.

6. SWP – POTENTIAL RISKS IN WELLFIELD AREA

- With no fences around the wellfield there is no prevention of contamination. A fence would be a deterrent.
- The well heads can be capped.
- CAO can explore and make sure that it is a Capital project for next year. Need access for well drilling trucks 20 x 20 around each well or at a minimum of 15 x 15 wide, big enough to get a truck in.
- The seals on the water lines that cross the river from the wellfields are in the flood plain and should be checked to make sure they are all intact.
- The test wells should be identified on the wellfield map.
- Recreational vehicles need to be added to potential contaminates in the wellfield area.

7. ANYTHING BY MEMBERS

Fred Roch, Landowner and Source Water Protection Representative, is in the process of selling his land.

Staff will find the most current version of mapping and most recent Final Protection Plan and go from there.

Water Operator, Jeff Hurlburt, will contact Lawrencetown to ask if they can send up pamphlets.

Recording Secretary, Susan Purcell, will send out the Source Water Protection Committee Terms of Reference and make copies of the binders for all members.

8. ADJOURNMENT

It was moved and seconded to adjourn the meeting at 7:26 p.m. Motion carried.

CHAIRPERSON

RECORDING SECRETARY

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Monday, July 10, 2023

A meeting of the Source Water Protection Advisory Committee was held at the Town Hall on Monday, July 10, 2023, starting at 5:00 p.m.

PRESENT

Councillor, Bernadette Knapp; Chair Councillor, Chad LeBlanc; Chief Administrative Officer, Ashley Crocker; Public Works Water Operator, Jeff Hurlburt; Regional Director of Public Works, Dan Wade; Town of Middleton Citizen Representative, Brenda Ford; NS Environment and Climate Change Representative, Mike Allen; NS Environment and Climate Change Representative, Greg Cummins; County of Annapolis, Wendy Sheridan; Resident Representative Fred Roch; Recording Secretary, Marjorie Amero.

1. CALL TO ORDER

Chair Councillor LeBlanc called the meeting to order at 5:00 p.m.

2. APPROVAL OF AGENDA

230710.01: It was moved and seconded that the agenda be approved as amended. Motion carried.

3. APPROVAL OF THE MINUTES

230710.02: It was moved and seconded to approve the Minutes of April 24, 2023, as circulated.

4. Welcome to New Member

Chair LeBlanc welcomed new member County of Annapolis Councillor, Wendy Sheridan.

5. OLD BUSINESS

a. Posting Signage and Enforcement

Discussion held and DPW Wade noted additional signs are on order and will be erected at Lily Lake once received. It was also noted that enforcement is not possible due to lack of a bylaw enforcement officer and a specific bylaw. It was suggested that a gate may be an option to consider. DPW Wade further noted he is awaiting additional fencing quotes and that the well heads will be fenced in.

b. Action Items from April 24th Meeting

i. Review Staff Report

The staff report was reviewed and discussed.

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Monday, July 10, 2023

ii. Action Item #2

Review Information Sheet to be distributed. Draft information sheet was circulated and discussed. or comment and input with the intention to be mailed to the affected residents.

iii. Action Item#5 Review Standard Operating Procedure

Review of SOP noting that they are a work in progress and will be brought forward to next meeting.

6. Reservoir and Wellfield Update

Discussion was held, still work in process.

7. Secondary Water Source

Decision was made to keep Lily Lake as the secondary water source. An Action plan needs to be developed on how to use it in case of emergency.

8. Updates to the Source Water Protection Plan

Updates will be made to the Plan when the annual Water Report is filed prior to April 1st of each year.

9. Information/Discussion Items

Open floor discussions were held.

10. Anything by Members

County Councillor, Sheridan commented that the East End Advisory Committee is doing a review on their future growth plan which would include a potential partnership with Middleton for the addition of wells in Middleton's wellfield.

CAO Crocker stated that they were looking into making an application to the Housing Accelerator Fund to encourage development for the Town and part of that is that the Town will engage CBCL for a full study to see what the Town infrastructure can handle with regards to development.

11. Next Meeting Date October 23 @ 5:00 pm

12. Adjournment

It was moved to adjourn the meeting at 5:52p.m.

CHAIRPERSON

RECORDING SECRETARY

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Monday, October 23, 2023

A meeting of the Source Water Protection Advisory Committee was held at the Town Hall on Monday, October 23, 2023, starting at 5:00 p.m.

PRESENT

Councillor Chad LeBlanc, Chair; Councillor Bernadette Knapp; Chief Administrative Officer, Ashley Crocker; Public Works Water Operator, Jeff Hurlburt; Director of Public Works, Jeff Borden; Town of Middleton Landowner Representatives, Brenda Ford and Ron Brown; NS Environment and Climate Change Representative, Mike Allen; Middleton Planner and Development Officer, Dawn Sutherland; County of Annapolis Landowner Representative Fred Roch; Recording Secretary, Marjorie Amero.

Also in Attendance: Citizens Nicole Peppard, Jamie Peppard, Brent Buckler, Brian Connell

Regrets: Wendy Sheridan, County of Annapolis Councillor, Greg Cummins

1. CALL TO ORDER

Chair LeBlanc called the meeting to order at 5:04 p.m.

2. APPROVAL OF AGENDA

231023.01: It was moved and seconded that the agenda be approved. Motion carried.

3. APPROVAL OF THE MINUTES

2301023.02: It was moved and seconded to approve the Minutes of July 10, 2023, as circulated.

4. Welcome to New Member

Chair LeBlanc welcomed new member Director of Public Works Jeff Borden and Middleton Planner and Development Officer, Dawn Sutherland.

5. OLD BUSINESS

i. Review Staff Report

Staff report was reviewed and discussed.

ii. Reservoir and Wellfield Update

A report was provided. Discussion was held, still work in progress.

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Monday, October 23, 2023

iii. Protected Water Area Designation Review

Still under review. There are currently no regulations in place for Lily Lake as a Protected Water Area. The Town needs to investigate whether regulations should be put in place. The County of Annapolis has not designated Lily Lake as a protected area or amended the zoning.

6. Information/Discussion Items

The Peppards bought land on Lily Lake 30 years ago and would like to add a cottage there. They stated that they are unable to go forward because currently Lily Lake is the secondary water source for the Town.

ACTION: Determine if the Peppards can build on the land

RESPONSIBILITY: Climate Change Representative Allen and Development Officer Sutherland will investigate an email chain that the CAO will circulate.

DATE: Next meeting

7. Anything by Members

Director of Public Works Borden asked for clarification about putting up more signs at Lily Lake. Councillor Knapp stated to keep the "No Trespassing" signs up.

Water Operator Hurlburt wanted clarification on whether Public Works should put up a gate at Lily Lake or not. The committee agreed that no gate is needed at this time.

8. Next Meeting

Date to be determined.

9. Adjournment

It was moved to adjourn the meeting at 5:58 p.m.

CHAIRPERSON

RECORDING SECRETARY

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Monday, July 22nd, 2024

A meeting of the Source Water Protection Advisory Committee was held at the Town Hall on Monday, July 22nd, 2024, starting at 5:00 p.m.

PRESENT

Councillor Chad LeBlanc, Chair; Councillor Bernadette Knapp; Public Works Water Operator, Jeff Hurlburt; Director of Public Works, Adam Verran; Town of Middleton Landowner Representatives, Brenda Ford and Ron Brown; NS Environment and Climate Change Representative, Mike Allen; Annapolis County Councillor Wendy Sheridan; Annapolis County Planner and Development Officer, Linda Bent; Recording Secretary, Dayle Crook.

Regrets: Middleton Planner and Development Officer, Dawn Sutherland; Chief Administrative Officer, Ashley Crocker; County of Annapolis Landowner Representative: **Vacant**

1. CALL TO ORDER

Chair LeBlanc called the meeting to order at 5:02 p.m.

2. APPROVAL OF AGENDA

Councillor Bernadette Knapp requested that there be a full agenda package provided (hole-punched) and physical copies of Agenda for next meeting, for all parties.

240722.01: It was moved and seconded that the agenda be approved. Motion carried.

3. APPROVAL OF THE MINUTES

240722.02: It was moved and seconded to approve the Minutes of October 23rd, 2023, as circulated.

4. NEW BUSINESS

Source Water Protection Advisory Committee policy and Committees of Council policies reviewed and approved; no changes suggested for these documents.

Election of Chair and Vice Chair

Nominations for the position of Chair were called. Chad LeBlanc was nominated as Chair and accepted.

240722.03 It was moved and seconded to elect Chad LeBlanc as Committee Chair. Motion carried.

Nominations for the position of Vice Chair were called. Bernadette Knapp was nominated and accepted.

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Monday, July 22nd, 2024

240722.04 It was moved and seconded to elect Bernadette Knapp as Vice Chair. Motion carried

5. OLD BUSINESS

***** UPDATE THIS (approximately 30 minutes into recording) Director of Public Works Borden asked for clarification about putting up more signs at Lily Lake. Councillor Knapp stated to keep the "No Trespassing" signs up.

Water Operator Hurlburt wanted clarification on whether Public Works should put up a gate at Lily Lake or not. The committee agreed that no gate is needed at this time.

i. Review Staff Report

Staff report was reviewed and discussed.

Linda Bent speaks to the properties surrounding Lily Lake – zoned as protected along road - extension to the east end to incorporate these properties by the county. (21 minutes into recording – add more detail).

Source water protection zones to be identified on mapping moving forward; consultant will be reaching out to Adam/Jeff regarding rezoning.

ii. Reservoir and Wellfield Update

A report was provided. Discussion was held, still work in progress.

Pending UARB approval for new reservoir; tender cannot be awarded until funding secured – announcement was made by the Province. Leaking at 16,000 litres per hour, which has increased since our last review. Treating water is being lost, rather than untreated water. Behind hill on junction road; approximate time of completion: 65 weeks. New tower with pump station equipped with chlorine injector for treatment of water.

Water tests coming back with reading well within limits. Postponed for at least a year. Flow meter for pump #2 has not yet been installed. Reservoir able to keep at current maximum capacity.

iii. Protected Water Area Designation Review

6. Information/Discussion Items

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Monday, July 22nd, 2024

Middleton Wellfield Projection Management Report review

ACTION: Review and approve report as provided, addition of suggestions or changes that are required

RESPONSIBILITY: Committee members

DATE: Next meeting

(35 minutes into recording) Can update with changes pending; regulations, planning and additional options. Protections to apply to areas. Action plan to be approved for movement forward.

7. Anything by Members

Wendy Sheridan – bylaw inquiry – is there any bylaw stating residents cannot put a well on their property? Adam explains that there are a couple of local businesses have requested to not tap into water system, or to have town water as a secondary use. Residents will need special permissions to bypass water services in town. Normal residents will be subject to use of town water.

Brenda Ford – tax inquiry – are taxes going to increase based on the reservoir work? The water rate may be increasing due to a current rate study that is going to be performed, not having been done in previous years. Adam says there may be an increase in cost due to reservoir being installed, however, where the water study is required to be done – that will likely increase the charges.

Adam Verran/Jeff Hurlburt – contingency plan – Jeff and Adam are working on a contingency plan related to water. Since they have not been updated since 2012- they have been working to update and ensure all policies are relevant and applicable. Going through CBCL, trucking in water – backup plan in place to activate if problems should arise. Monitoring plan is required to be in place by the Source water Protection Committee; water should be monitored. To be drafted and presented to the committee.

8. Next Meeting

Tuesday, October 15th, 2024, at 5:15pm

9. Adjournment

It was moved to adjourn the meeting at 5:43 p.m.

**SOURCE WATER PROTECTION
ADVISORY COMMITTEE**

Monday, July 22nd, 2024

CHAIRPERSON

RECORDING SECRETARY

DRAFT

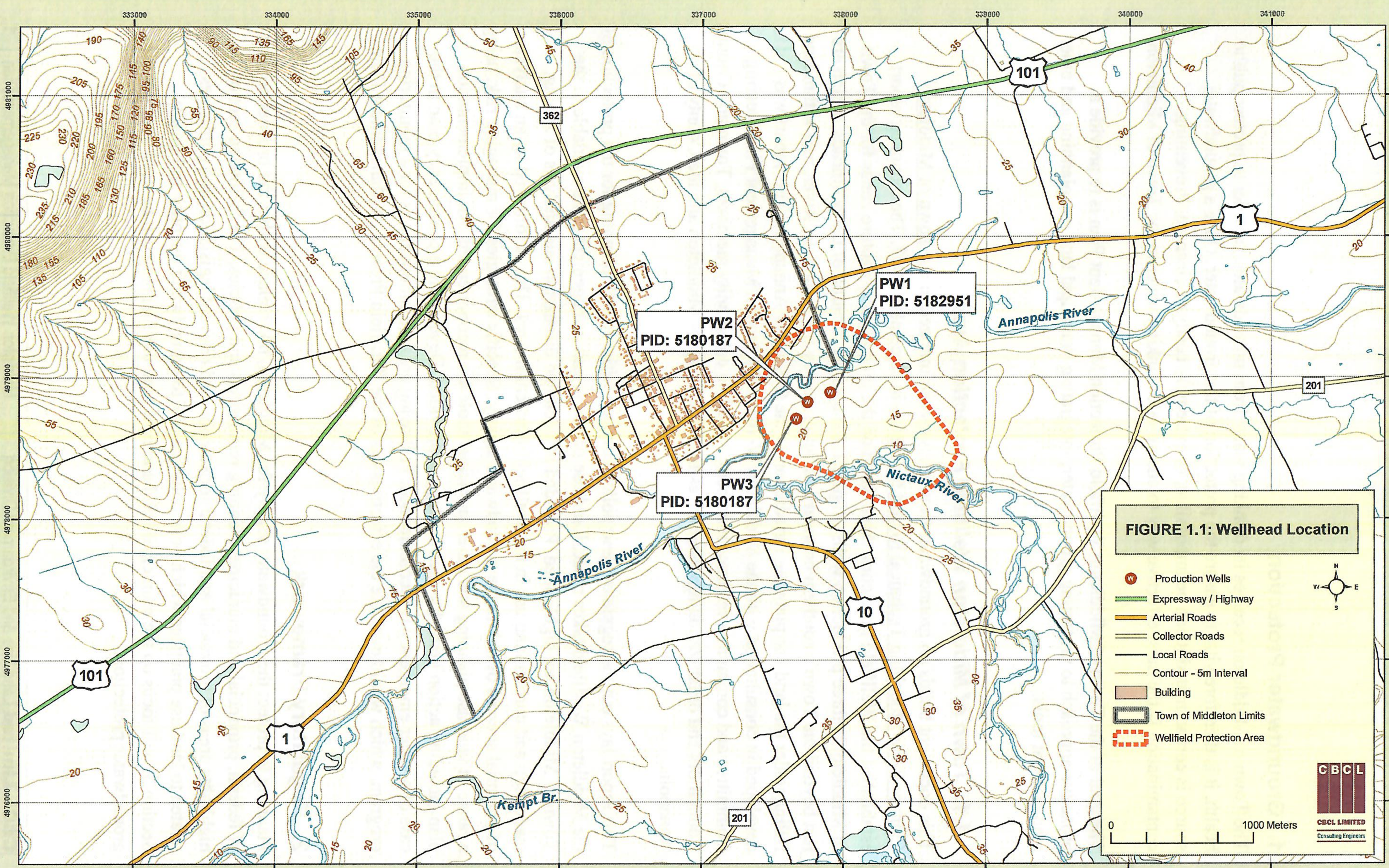
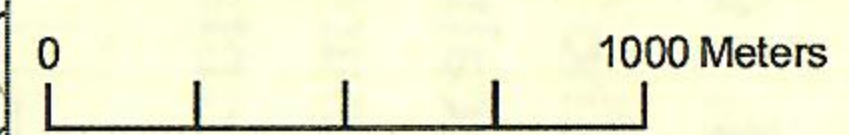
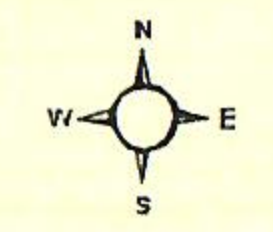


FIGURE 1.1: Wellhead Location

- Production Wells
- Expressway / Highway
- Arterial Roads
- Collector Roads
- Local Roads
- Contour - 5m Interval
- Building
- Town of Middleton Limits
- Wellfield Protection Area



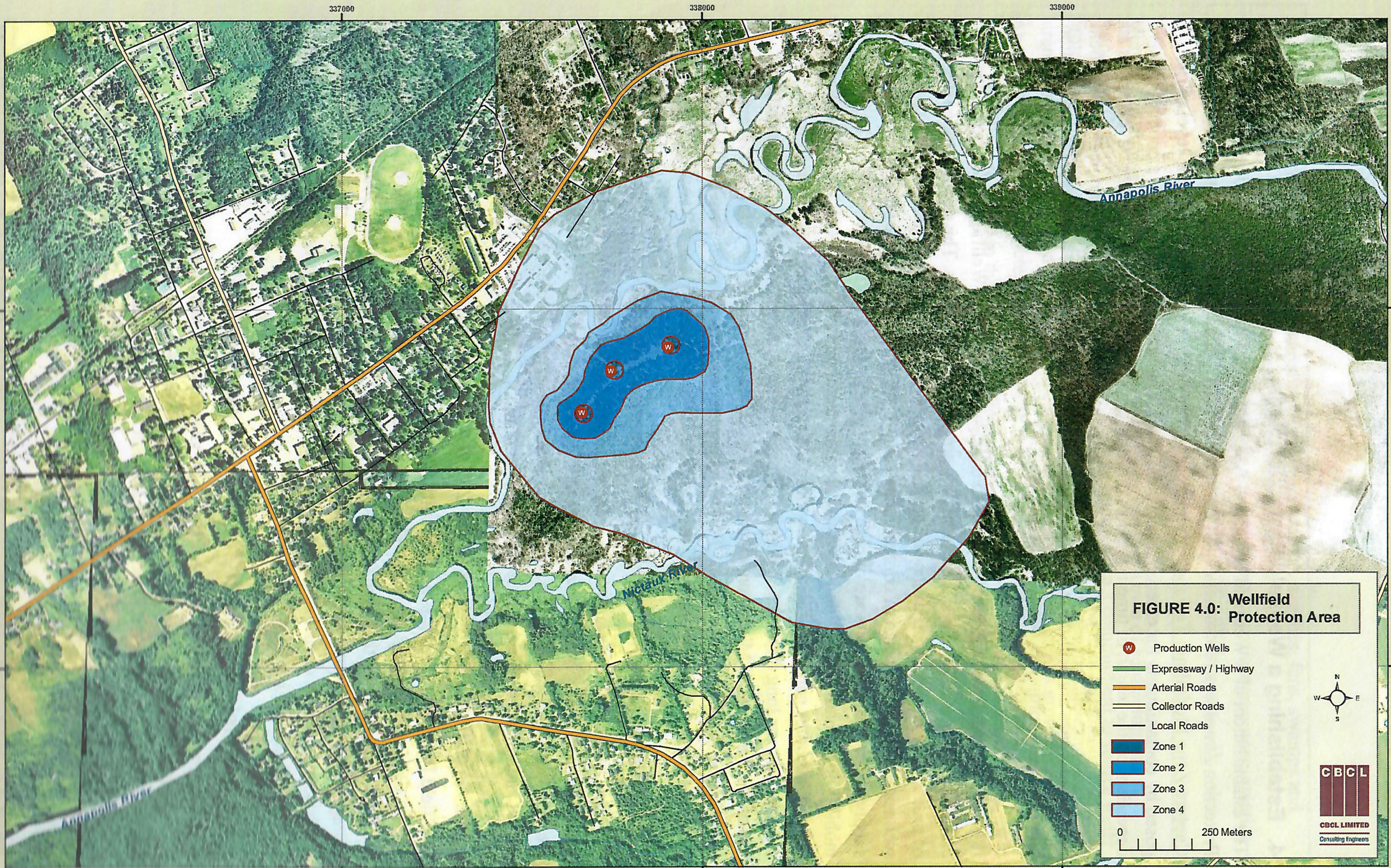
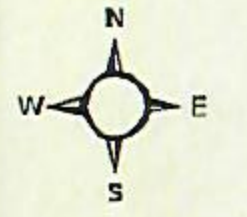
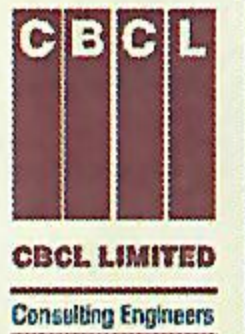


FIGURE 4.0: Wellfield Protection Area

-  Production Wells
-  Expressway / Highway
-  Arterial Roads
-  Collector Roads
-  Local Roads
-  Zone 1
-  Zone 2
-  Zone 3
-  Zone 4



0 250 Meters



Reservoir , Water Utility & Wellfield Update for SWPP Committee March 17 2025

Reservoir Update

- 1) The creation of an Emergency Action Plan has been initiated, an inundation map was created that showed some damage to the road if the reservoir bursts. That will potentially lead us to mitigation strategies.
- 2) The new reservoir construction started in July 2024 and is at about 30% complete. It is on track to be completed in early 2026
- 3) CBCL conducted an inspection of the current reservoir and did a leak test. Divers took video of the inside of the reservoir.
- 4) The town received funding from DMAF to help build the new reservoir
- 5) There is an out flow pipe from the reservoir to eel brook that a lot of the ground water and leakage from the current reservoir is being drained with.

Water Utility & Wellfield Update

- 1) All last year's tests were completed with no health-related issues and came back with results well below acceptable limits and the water quality provided to the town is still very high.
- 2) Well #1 is scheduled to be cleaned in 2025-2026 fiscal year, to reduce the iron and manganese bacteria that are typically found to have developed within drilled well casings, replacement of the well pump is also scheduled during the process.
- 3) We are still awaiting installation of the Flow Meter for Well #2 , given the state of the reservoir and the lack of back up water supply it has been discussed to push this project to after the new reservoir is on line to allow the town to have a more acceptable back up water supply while the work is being completed
- 4) To date all sampling results from 2024's and 2025's sampling plan have come back within acceptable limits of the NSECC guidelines.
- 5) The booster pumps were rebuilt and we have had limited issues the last 6-7 months.