Mississippi Mills

Water & Wastewater Infrastructure Master Plan

Public Information Centre No. 2

January 18, 2024

J. L. Richards & Associates Ltd.

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Public Information Centre No. 2 Agenda

- Class Environmental Assessments & Master Plan Process
- Project Background & Population Growth Projections
- Problem/Opportunity Statement
- Potable Water Supply, Storage, & Distribution Systems
- Wastewater Treatment, Pumping, & Collection Systems
- Next Steps & Consultation Process

Mississippi Mills Water & Wastewater Infrastructure Master Plan

The Municipal Class Environmental Assessment Master Plan Process

Class EA Process

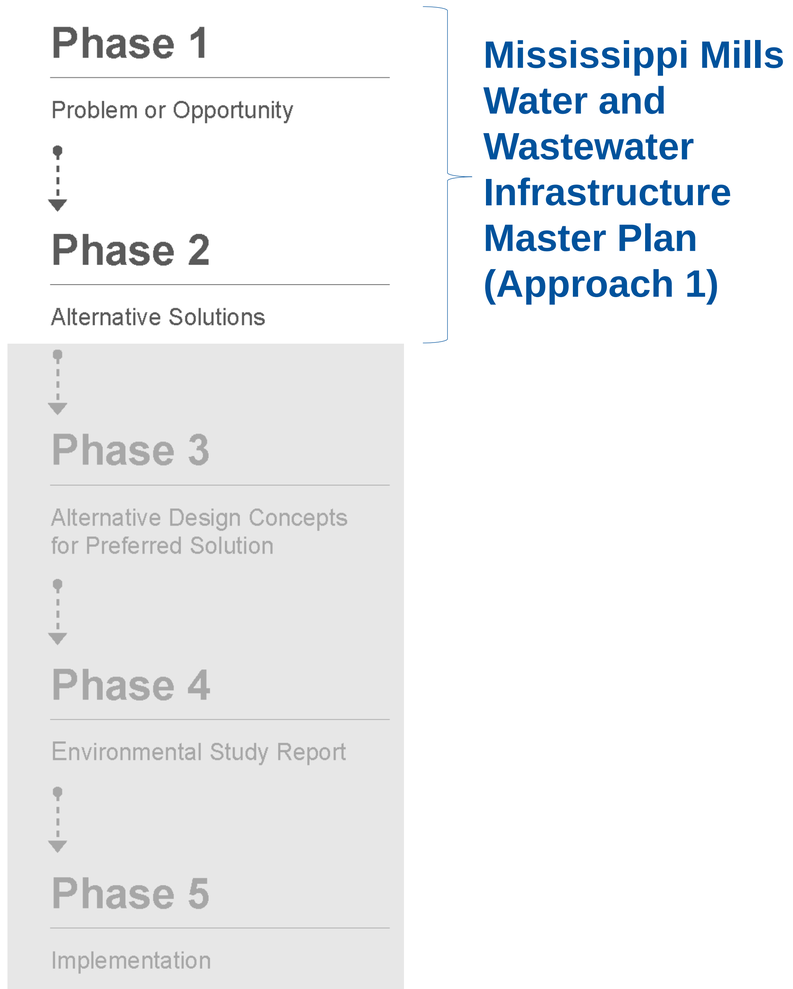
The *Ontario Environmental Assessment (EA) Act*, R.S.O., 1990 requires that projects corresponding to municipal infrastructure projects, including roads, water, and wastewater projects follow an approved planning process set out in the Municipal Class EA document prepared by the Municipal Engineers Association (MEA).

Master Plan Process

Master Plans are conducted under the framework of the MEA Class EA Process. They are a planning tool that identifies infrastructure and other requirements for the existing and future land use, through the application of environmental assessment principles. The current Master Plan is intended to satisfy Phases 1 and 2 of the Municipal Class EA process (i.e., *Approach 1*).

Master Plan Approach 1

This approach concludes at the end of Phases 1 and 2. With this approach, the Master Plan is being completed at a **broad level of assessment** and may require further detailed assessment at the project-specific level.



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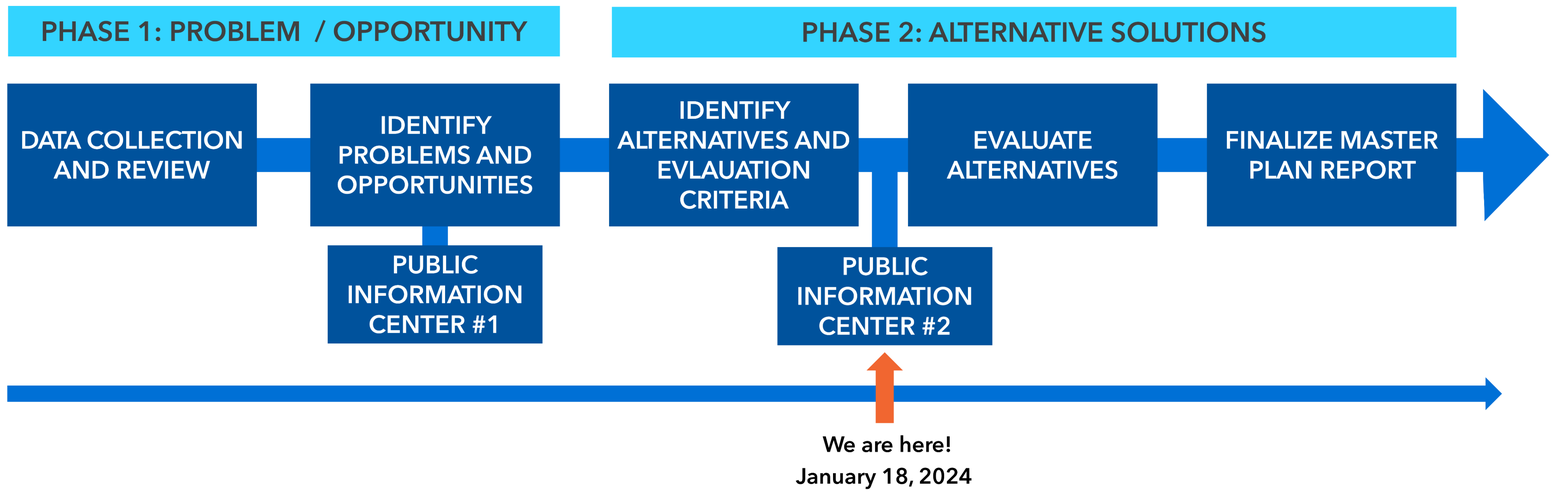
Mississippi Mills Water & Wastewater Infrastructure Master Plan Process

Project Timeline

1. April: Public Information Center No. 1
2. September: Finalize Population Projections
3. November: Phase 1 Report
4. December: Assessment of Alternatives
5. **January: Public Information Center No. 2**
6. February: Finalize Phase 2 Report
7. March: 30 Day Review Period



Phase 1 – Problem/Opportunity

- Collect and review **background documents.**
- Confirm **future growth and planning projections.**
- Establish a **design basis** and future water and wastewater demands.
- Review **water supply capacity.**
- Review **wastewater treatment capacity** with a focus on **Gemmill's Bay Pumping Station.**
- Update existing water and wastewater computer simulations
- Summarize findings and update stakeholders

Phase 2 – Alternative Solutions

- Review **alternative water and wastewater servicing options** and **selecting preferred alternatives**.
- Prepare a draft Master Plan Report for review.
- Hold a **Public Information Center** to present the proposed alternatives and preferred solutions to the public.
- Re-evaluate servicing concepts based on comments received
- Filing the Master Plan with the Ontario **Ministry of the Environment conservation, and Parks** for 30-day review period.
- Issuing **Notice of Completion** and finalizing report

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Mississippi Mills Water & Wastewater Infrastructure Master Plan

Project Background: 2012 to 2022

2012: Water and Wastewater Infrastructure Master Plan

- For **Almonte**
- To the year **2031**

2018: Master Plan Update

- Reaffirmed preferred servicing alternatives from 2012 Master Plan.
- Roadmap for future upgrades within the **sewage** collection, pumping and treatment systems and the **water** supply, distribution, and storage systems for **short, mid, and long-term** requirements.

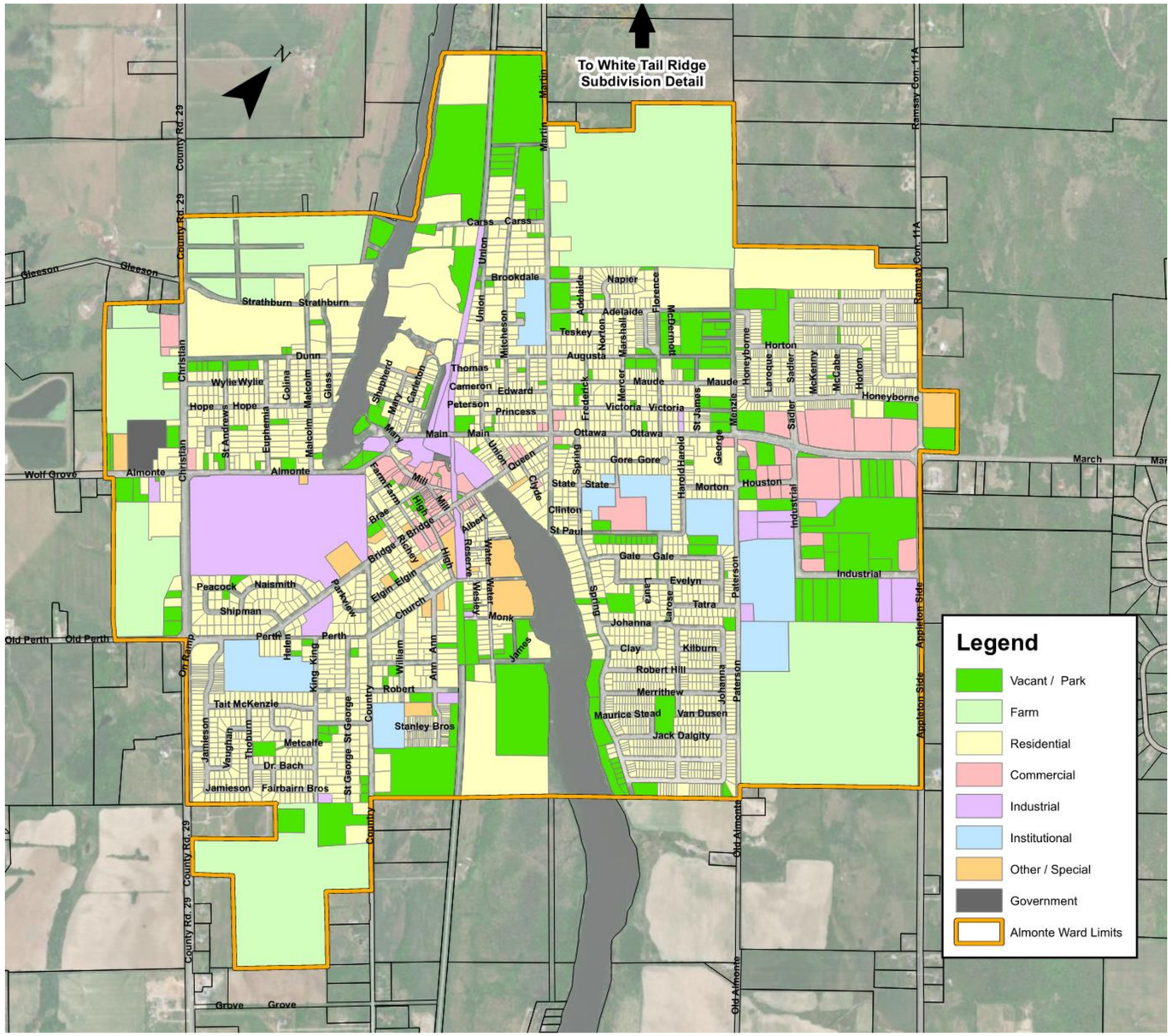
2018-2022: Changes within the Municipality

- New **population projections** from Lanark County.
- Commissioning of the **Victoria Street trunk sewer and watermain.**
- **Expansion of the Urban Boundary** in an Official Plan Amendment.
- Construction of **new water reservoir and booster pumping station.**

2023: New Water and Wastewater Infrastructure Master Plan

- To develop **water and wastewater servicing strategies** that align with updated population projections.
- To **meet existing regulations, existing and future service areas** for Almonte over the **next 25 years.**
- To create tools for operational and capital improvements to the water and wastewater systems.

Mississippi Mills Future Growth Projections



Projection Period	Population Estimate
Existing (2021 Census)	6,098
Short-Term (1-5 Years; 2023-2028)	8,238
Mid-Term (5-15 Years; 2028-2038)	11,579
Long-Term (15-25 Years; 2038-2048)	12,813

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Potable Water Supply and Well Pumping Capacity

System Parameter (L/s)	Period	Max Day Demand (L/s)	Deficit (Existing Supply) (L/s)	Deficit from Full Yield (L/s)	Deficit from Full Yield at Only Wells 7 & 8 (L/s)
Existing Supply 70.1	**Existing**	53.5	None	None	None
	Short-Term (2023-2028)	96.0	25.9	None	None
Full Yield 106.8	**Mid-Term** (2028-2038)	126.7	56.6	19.9	25.6
Full Yield at Wells 7 & 8(1) 101.1	**Long-Term** (2038-2048)	149.0	78.9	42.2	47.9

(1) This total is equal to the current operating limits of Wells 3, 5, and 6 (7.1 + 6.4 +11.9 = 25.4 L/s) plus an upgraded operating limit of 75.7 L/s for Wells 7 and 8.

Problem/Opportunity

- The current operating capacity of Almonte's wells is less than what is required to support future growth.
- Upgrades to the existing pumps at Wells 7 and 8 will increase pumping capacity but not enough to support future growth.
- The Nepean Sandstone aquifer located on the west side of Almonte is expected to be a viable source to increase supply.

Alternative Solutions

Short Term (2023-2028)

- Increase the pumping capacity of Wells 7 & 8 to their full demonstrated yield

Mid Term (2038-2048)

- **Preferred:** New well(s)
- **Not preferred:** New water treatment plant

Potable Water Supply and Well Pumping Capacity

Criteria	Option 1: Do Nothing	Option 2: New Well(s)	Option 3: New Water Treatment Plant
Overall Evaluation:	**Not preferred**	**Preferred**	**Not preferred**
Natural Environment	No impact on water quality or quantity.	Local aquifer can support additional water supply from a new well(s).	Additional studies required to assess if surface water can support a new water treatment plant.
Evaluation:	No Impact	No Impact	Negative Impact
Climate Change	Makes Almonte's potable water infrastructure vulnerable to impacts of climate change (ex. droughts).	Least infrastructure, results in less GHG emissions. Increases well redundancy. Aquifer is a reliable source but reliance on groundwater limits the system's resiliency.	Larger infrastructure produces more GHG emissions from long-term operations and construction. Vulnerable to impacts of climate change and drought conditions of the Mississippi River.
Evaluation:	Negative Impact	No Impact	Negative Impact
Social, Cultural, & Heritage Environment	No impacts on social, cultural, and heritage resources, air quality, or the community. No construction or operation impacts.	Minimal impacts on social, cultural, and heritage resources, air quality, or the community. Minimal construction or operation impacts.	Highest impacts on social, cultural, and heritage resources, air quality, or the community. Highest construction or operation impacts.
Evaluation:	No Impact	No Impact	Negative Impact
Technical Feasibility	Will not be able to supply water for mid-term growth.	Will be able to supply water for mid-term growth. Easily integrated into existing distribution system.	Will be able to supply water for mid-term growth. Challenging to integrate into existing distribution system.
Evaluation:	Negative Impact	Positive Impact	No Impact
Financial	No capital costs. Inaction may lead to high financial impacts in the future.	Lower capital and operational costs.	Highest capital and operational costs.
Evaluation:	No Impact	Positive Impact	Negative Impact

Next Steps

Short Term (0-5 years)

- Increase the pumping capacity of Wells 7 & 8 to their full demonstrated yield.
- Determine suitable well site for the construction of new well. Well location will be determined based on separation distances and the drilling of a test well.
- **Cost: $2.5M**

Mid Term (5-15 years)

- Drill and bring online a new well(s).
- **Cost: $6.5M**

Long Term (15-25 years)

- Expand the capacity of the new well(s) to accommodate growth.
- **Cost: $500,000**

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Potable Water Storage: Towers and Tanks

Period	Equivalent Population (1)	Volume (m^3)					
		Existing Storage	'A'	'B'	'C'	Required Storage	Deficit
Existing	6650	5330	1718	1334	763	3814	**None**
Short-Term (2023-2028)	10856	5330	2100	2073	1043	5216	**None**
Mid-Term (2028-2038)	13677	5330	2356	2736	1273	6365	**1035**
Long-Term (2038-2048)	16525	5330	3487	3218	1676	8381	**3051**

(1) Equivalent population determined using a demand of 35,000 m^3/ha for light industrial lands, 28,000 m^3/ha for commercial lands, and 350 L/d per capita.
(2) Existing storage is inclusive of both the elevated tank and at-grade storage reservoir.

Problem/Opportunity

- Within the mid-term (2028 to 2038) the existing water tower and ground level water storage tank will not have enough storage capacity to meet the water system demands.

Alternative Solutions

Mid Term (2038-2048)

- **Preferred:** New Water Tower (elevated tank)
- **Not preferred:** Expansion of booster pumping station and reservoir
- **Not carried forward:** New booster pumping station and reservoir
- **Not carried forward:** Second water tower

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Potable Water Storage: Towers and Tanks

Criteria	Option 1: Do Nothing	Option 2: Expand Water Storage & Booster Pumps	Option 3: New Elevated Tank
Overall Evaluation:	**Not preferred**	**Not preferred**	**Preferred**
Natural Environment	No impact on water quality or quantity.	Higher impact due to new construction. Improves water distribution system.	Some impact due to new construction. Improves water distribution system.
Evaluation:	No Impact	Positive Impact	Positive Impact
Climate Change	Almonte remains vulnerable to impacts of climate change (ex. droughts).	Expanded infrastructure makes community more resilient.	New infrastructure makes community more resilient. Lower GHG emissions from less energy to maintain system pressure.
Evaluation:	Negative Impact	Positive Impact	Positive Impact
Social, Cultural, & Heritage Environment	No impacts on social, cultural, and heritage resources, air quality, or the community. No construction or operation impacts.	Some impacts on social, cultural, and heritage resources, air quality, or the community. Some construction and high operation impacts.	Low impacts on social, cultural, and heritage resources, air quality, or the community. Some construction and low operation impacts.
Evaluation:	No Impact	Negative Impact	Negative Impact
Technical Feasibility	Will not be able to support mid-term growth.	Requires the most infrastructure and reliance on pumps to support mid-term growth and beyond.	Will be able to support mid-term and beyond. Ease of integrate into existing distribution system.
Evaluation:	Negative Impact	Negative Impact	Positive Impact
Financial	No capital costs. Inaction may lead to high financial impacts in the future.	High capital but highest operational costs.	High capital but lowest operational costs.
Evaluation:	No Impact	Negative Impact	Negative Impact

Next Steps

Mid Term (5-15 years)

- Undertake a Schedule B Class Environmental Assessment to support the construction of a new Elevated Water Storage Tank.
- Assess the need for new trunk watermains.
- Construct the tank.
- **Cost: $13M**

Long Term (15-25 years)

- Expand the capacity of the new tank to accommodate growth.

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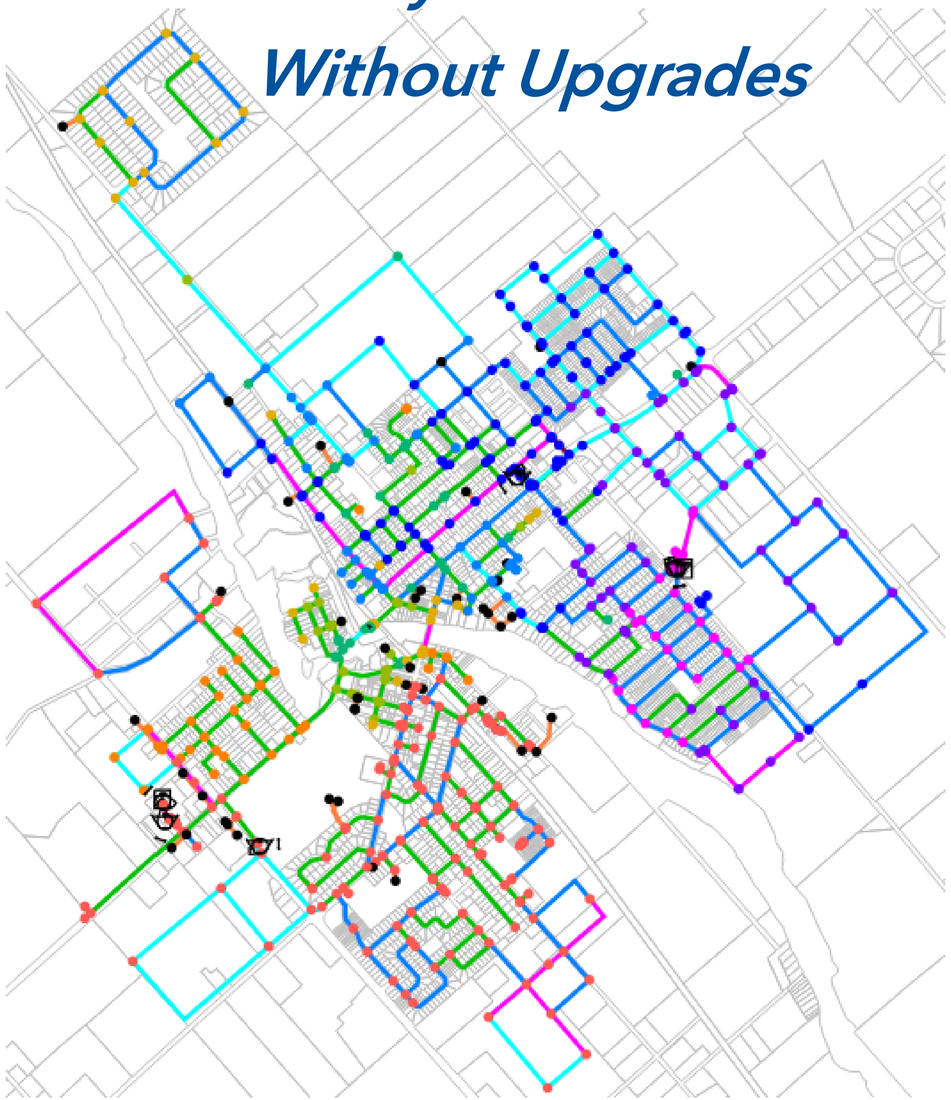
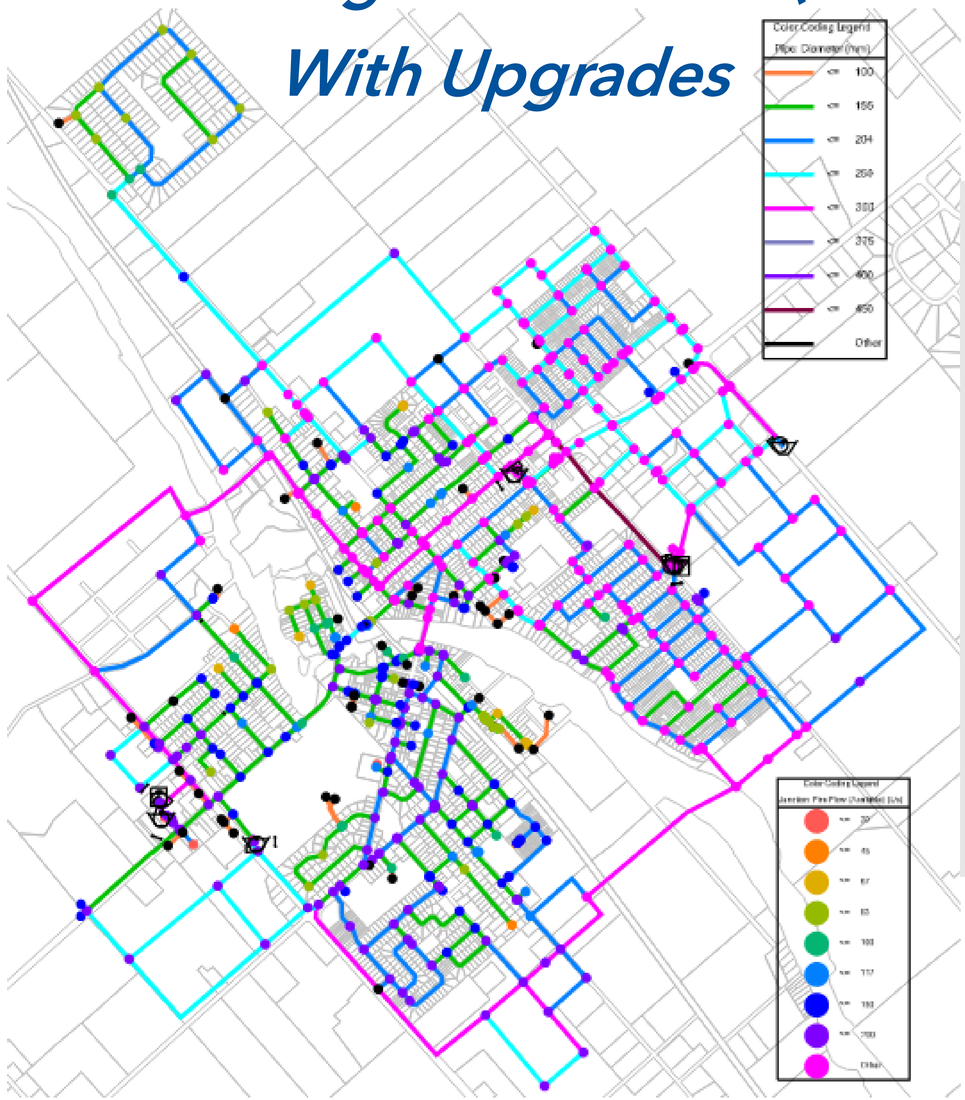
Potable Water Distribution System

Maximum Day Demand with Fire Flow: Long Term Growth (2038 to 2048)

Without Upgrades



With Upgrades



Problem/Opportunity

- The existing water distribution system needs to be expanded to supply new development areas.
- The expanded water distribution system cannot supply adequate fire flow and pressure to all areas of Almonte under increased growth without upgrades to the existing distribution system.

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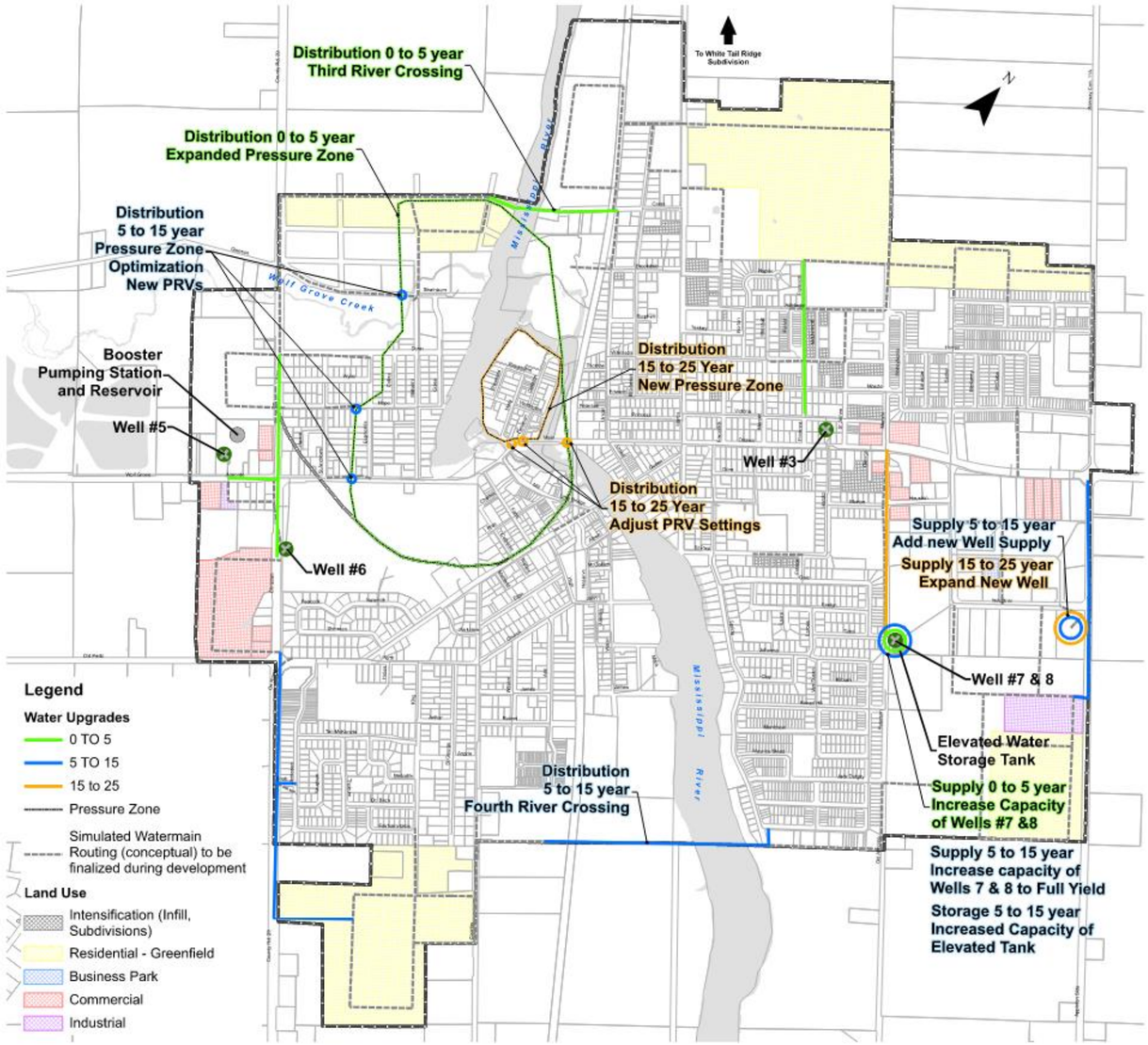
Potable Water Infrastructure Upgrades



Next Steps

Short Term (0-5 years)

- Extend watermain along northern County Road 29.
- Install new Pressure Reducing Valves.
- Install a watermain that crosses the Mississippi River at the northern end of Almonte.
- Upgrade the watermain along Florence Street.
- Pressure Zone Optimization
- Watermain Condition Upgrades
- **Cost: $33.5M**

Mid Term (5-15 years)

- Install a watermain that crosses the Mississippi River at the southern end of Almonte.
- Install watermain along southern Country Road 29.
- Watermain condition upgrades
- **Cost: $46M**

Long Term (15-25 years)

- Install 450 mm watermain from Ottawa to Patterson St to the elevated water tower.
- Create new Island Pressure Zone
- Watermain condition upgrades
- **Cost: $5.3M**

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Proposed Implementation Plan: Potable Water Infrastructure

Project Type	Project	Short-Term (0-5 Years)	Mid-Term (5-15 Years)	Long-Term (15-25 Years)
Water Distribution	Third River Crossing	$6.5M	-	-
	County Road 29 Upgrade North	$1.4M		
	Upgrade watermain along Florence Street	$680,000		
	Optimize Pressure Zones and Install New PRVs	$100,000	$300,000	$300,000
Water Supply	Increase Capacity of Wells 7 & 8 (New Well)	$2M	$500,000	-
	Well site selection and well testing	$500,000	-	
Water Distribution	Fourth River Crossing	-	$17M	-
	Watermain extension along Country Road 29 South		$1.4M	
Water Supply	New Well(s) installation and expansion	-	$6.5M	$500,000
Water Storage	Increase Capacity of Elevated Tank	-	$13M	-
Water Distribution	Paterson St WM Upgrade	-	-	$1.4M
Water Distribution	Watermain Condition Upgrades	$22.3M	$7.3M	$3.1M
	TOTAL	**$33.5M**	**$46M**	**$5.3M**

Wastewater Treatment System Capacity

	Contribution from Existing Areas (m3/d)		Contribution from Future Growth Areas (m3/d)		Total Flow (m3/d)		Peaking Factor	Total Peak Instantaneous Flow (m3/d)
	Average Day Flow	Maximum Day Flow	Average Day Flow	Maximum Day Flow	Average Day Flow	Maximum Day Flow		
Existing	3780	19700	0	0	3780	19700	5.2	
Short-Term (2023-2028)	3780	19700	2037	6111	5817	25811	4.4	37584
Mid-Term (2028-2038)	3780	19700	3907	11721	7687	31421	4.1	41904
Long-Term (2038-2048)	3780	19700	5229	15687	9009	35387	3.9	45187

Total flow estimate under average day and maximum day considers the existing flow due to current population as well as the flow contributions from short-term, mid-term and long-term growth.

Problem/Opportunity

- Short term maximum daily flows exceed the peak flow capacity of the existing Wastewater Treatment Plant

Alternative Solutions

- **Preferred:** Expansion of the existing Wastewater Treatment Plant

Wastewater Treatment System Capacity

Criteria	Option 1: Do Nothing	Option 2: New Wastewater Treatment Plant
Overall Evaluation:	**Not preferred**	**Preferred**
Natural Environment	Negative impact on environment due to inability to treat high wastewater flows.	Will improve system's ability to treat wastewater flows and limit bypasses.
Evaluation:	No Impact	Positive Impact
Climate Change	Makes Almonte's wastewater infrastructure vulnerable to impacts of climate change (ex. Floods resulting in bypasses).	Improved infrastructure makes community more resilient. Some GHG production from facility.
Evaluation:	Negative Impact	Positive Impact
Social, Cultural, & Heritage Environment	Bypasses impact the community, air quality, and operation.	Some impacts on social, cultural, and heritage resources, air quality, or the community. Some construction or operation impacts.
Evaluation:	Negative Impact	Negative Impact
Technical Feasibility	Will not be able to support short term growth.	Will be able to support short term growth.
Evaluation:	Negative Impact	Positive Impact
Financial	No capital costs. Inaction may lead to high financial impacts in the future.	Higher capital and operational costs.
Evaluation:	No Impact	Negative Impact

Next Steps

Short Term (0-5 years)

- Conduct a Schedule C Class EA to support the construction of a Wastewater Treatment Plant Expansion (WWTP)
- WWTP Expansion
- **Cost: $ 75M**

Mid Term (5-15 years)

- Expanded in Short Term to accommodate growth.

Long Term (15-25 years)

- Expanded in Short Term to accommodate growth.

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Wastewater Collection and Pumping

Problem/Opportunity

- Existing flows are exceeding the capacity of the Gemmill's Bay Pumping Station resulting in an increase in bypass events.
- Collection system needs upgrading and expansion to support future growth.

Study Period	Design Capacity (L/s)[1]	Operational Capacity (L/s)[2]	Projected Peak Flows (L/s)[3]	Deficit (L/s)
Existing	325	225	398	**173**
Short-Term (2023-2028)	325	225	435	**210**
Mid-Term (2028-2038)	325	225	485	**260**
Long-Term (2038-2048)	325	225	523	**298**

1. From 2010 Design Report (TRG), likely the sum of two pumps rated at 163 L/s.
2. From 2018 OCWA pump testing.
3. Flows from land-use planning projections and hydraulic wastewater model. This does not account for historic raw sewage bypasses at the Gemmill's Bay SPS.

Alternative Solutions

- Build a new sewage pumping station to replace Gemmill's Bay

Criteria	Option 1: Do Nothing	Option 2: Gemmill's Bay SPS Expansion
Overall Evaluation:	**Not preferred**	**Preferred**
Natural Environment	Negative impact on environment due to inability to treat high wastewater flows.	Will improve system's ability to treat wastewater flows and limit overflows.
Evaluation:	No Impact	Positive Impact
Climate Change	Makes Almonte's wastewater system vulnerable to impacts of climate change (ex. increased storm intensity resulting in raw sewer overflows).	Improved infrastructure makes community more resilient.
Evaluation:	Negative Impact	Positive Impact
Social, Cultural, & Heritage Environment	Overflows impact the community, air quality, and operation. Increase in bypass frequency of wastewater flow to the Mississippi river.	Some impacts on social, cultural, and heritage resources, air quality, or the community. Some construction or operation impacts.
Evaluation:	Negative Impact	Positive Impact
Technical Feasibility	Will not be able to support short term growth.	Will be able to support short term growth.
Evaluation:	Negative Impact	Positive Impact
Financial	No capital costs. Inaction may lead to high financial impacts in the future.	Higher capital and operational costs.
Evaluation:	No Impact	Negative Impact

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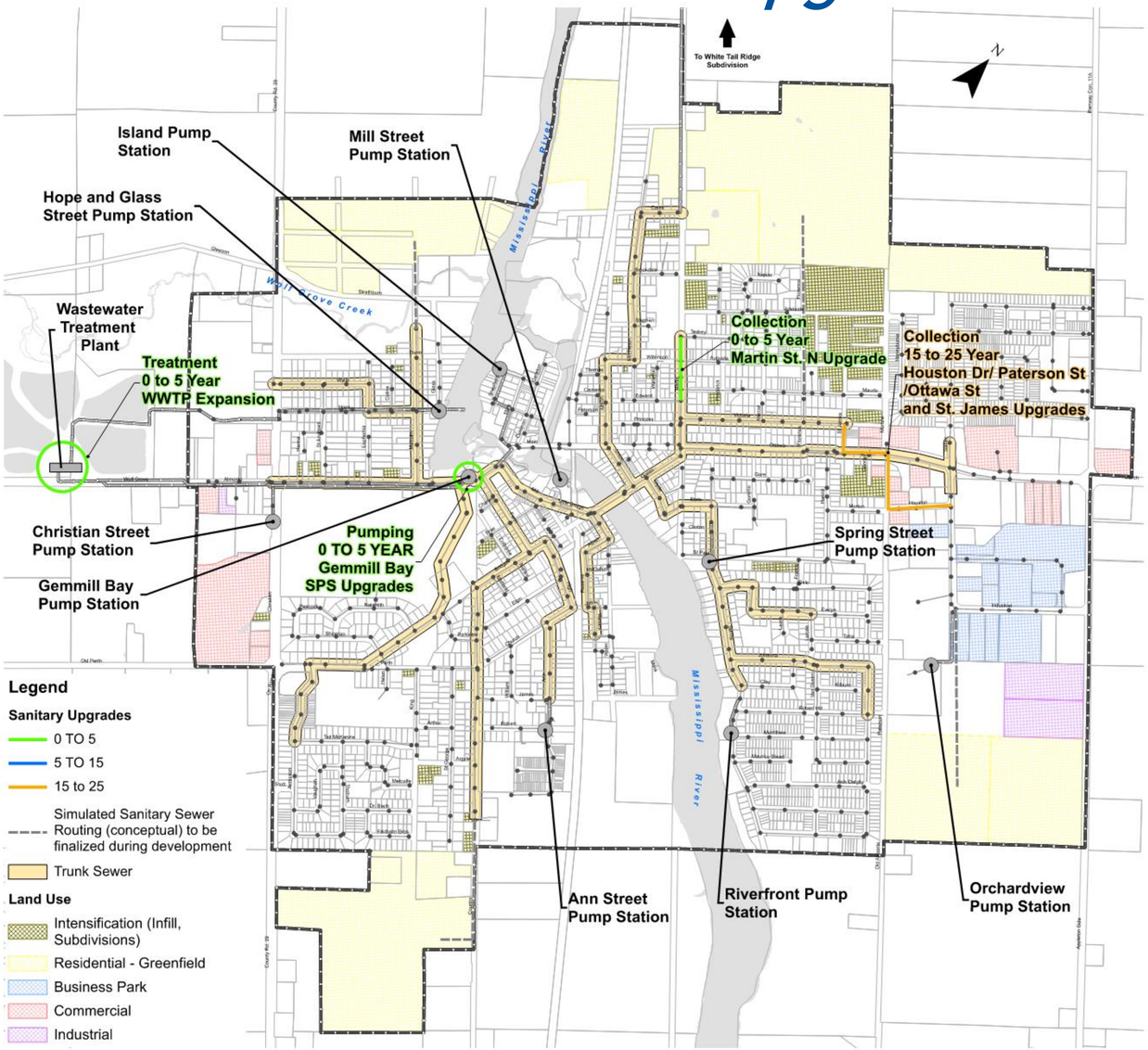
Wastewater Infrastructure Upgrades



Next Steps

Short Term (0-5 years)

- Expand the existing Gemmill's Bay SPS
- Martin Street North Sewer Upgrade
- Sewer Condition Upgrades
- **Cost: $107.5M**

Mid Term (5-15 years)

- Gemmill's Bay SPS expanded in Short Term to accommodate growth.
- Sewer Condition Upgrades
- **Cost: $6.5M**

Long Term (15-25 years)

- Houston Dr./ Paterson St. /Ottawa St. and St. James Street Sewer Upgrades
- **Cost $10.1M**

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Proposed Implementation Plan: Wastewater Infrastructure

Project Type	Project	Short-Term (0-5 Years)	Mid-Term (5-15 Years)	Long-Term (15-25 Years)
Wastewater Collection	Martin St. N Upgrade	$500,000	-	-
	Gemmill's Bay SPS Upgrade	$15M	-	-
Wastewater Treatment	Wastewater Treatment Plant Expansion	$75M	-	-
Wastewater Collection	Houston Dr./ Paterson St./ Ottawa St. and St. James Upgrades	-	-	$1.5M
Wastewater Collection	Sewer condition upgrades	$17M	$6.5M	$8.6M
	TOTAL	**$107.5M**	**$6.5M**	**$10.1M**

Mississippi Mills Water & Wastewater Infrastructure Master Plan

Next Steps

January 2024: Compile comments from Public Information Centre No. 2

February 2024: Finalize Master Plan Recommendations in the Master Plan Report

March 2024: Issue Notice of Completion and place Master Plan on public record for 30 days.

Spring/Summer 2024: Municipality commences further studies selected from Master Plan recommendations.

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Comments and Concerns?

Engagement

- Implement a Public/Agency Engagement Plan
- Identify Stakeholders, mandatory contacts and other interested parties.
- Issue Notices by Mail and Email for
  - Commencement
  - Public Information Centers
  - Completion

Indigenous Consultation

In undertaking the consultation process with stakeholders, specific engagement was made with Indigenous communities and inherent rights and treaty holders to ensure an inclusive and holistic engagement process that promotes Indigenous sovereignty and well-being.

For More Information:

To provide comments, preserve appeal rights, and stay updated, please visit:

mississippimills.ca/en/MM2048.aspx