The Town of Petrolia
Waste Management of Canada

CLASS ENVIRONMENTAL ASSESSMENT FOR WASTEWATER TREATMENT AND LANDFILL LEACHATE MANAGEMENT

ENVIRONMENTAL STUDY REPORT

EXECUTIVE SUMMARY

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REPORT PREPARATION AND REVIEW LOG

Version	Date	Prepared By	QC Reviewer	Project Manager
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EXECUTIVE SUMMARY

ES-1 BACKGROUND AND PURPOSE

ES-1.1 BACKGROUND

The Town of Petrolia is situated within the County of Lambton, located in South Western Ontario.

Petrolia owns a wastewater treatment plant (WWTP) that services the properties within the Town. It is an extended aeration facility with tertiary filtration and ultraviolet disinfection, with a rated capacity of 3,800 m^3/d, discharging effluent to Bear Creek. The plant was originally constructed in 1975 and has undergone several improvements since that time. However, because most of the processes and structures are more than 35 years old, the plant requires major upgrades. Major tank processes do not provide adequate capacity to treat the Certificate of Approval rated flow and many of the plant processes continue to use equipment that is well past its useful life.

In addition to the major upgrades required, the Petrolia WWTP is operating at approximately 80% of its rated capacity, with flows in some months averaging between 85% and more than 100% . Recent growth and planning studies indicate that growth in the area within the next 25 years will require expansion of the plant capacity.

The Petrolia Landfill, also located within the Town, is owned and operated by Waste Management of Canada Corporation (WM). The site currently uses 26.02 hectares of land for disposal of municipal, industrial, commercial and institutional solid non-hazardous waste. Included in the Landfill are a gas management system for the collection of landfill gas and a leachate collection system. The leachate is currently hauled by truck to a number of alternative municipal treatment facilities. The landfill gas is utilized for electrical generation.

Since the Petrolia Landfill is located less than 1 km from the Petrolia wastewater collection system and approximately 2.5 km from the Petrolia WWTP, there is an opportunity to direct leachate through the wastewater collection system or a dedicated pipe from the landfill to the Petrolia WWTP for treatment. This would significantly reduce or eliminate the number of trucks, hauling distance and corresponding greenhouse gas emissions associated with the leachate disposal.

Currently the Petrolia WWTP does not have capacity or reliability to accept the additional loadings from the Petrolia Landfill leachate.

The Town of Petrolia and Waste Management of Canada are seeking the most environmentally sound and cost-effective solution to manage their wastewater and leachate and one solution that shows significant promise is to co-treat leachate with wastewater at the Petrolia WWTP. Completion of a Class Environmental Assessment (EA) study to plan for the management of wastewater and leachate will provide a sound, thorough approach evaluating a full range of solutions to identify preferred solutions for the Town and Waste Management, considering all potential environmental, community and cost impacts. This Schedule C Class EA was undertaken to plan for the expansion of the Petrolia WWTP to meet growth needs in the Town, and to plan for long term management of the Petrolia Landfill leachate.

ES-1.2 STUDY OBJECTIVES

This Environmental Study Report (ESR) was completed in accordance with the Schedule C Class EA required by the MOE. It documents the study area and its historical and current condition, alternative solutions and design concepts considered for providing wastewater treatment and leachate management for the Town of Petrolia and Waste Management of Canada, respectively. Rational for the preferred design concepts are discussed as well as impacts and mitigation measures. Finally the report includes public, agency and Aboriginal and First Nations consultation records and feedback.

A 30-day review period is available to members of the public, interest groups and review agencies, as required by the Class EA process. Any outstanding concerns regarding the project that cannot be resolved in discussion with the Town of Petrolia may request the Minister of the Environment to make an order for the project to comply with Part II of the Environmental Assessment Act, which addresses the individual environmental assessment, by submitting a written request to the Ministry of Environment at the following address:

The Honourable Jim Bradley
Minister of the Environment
77 Wellesley Street West
11th Floor, Ferguson Block
Toronto, ON M7A 2T5

If no Part II Order (bump-up) requests are received within the 30-day review period, the project will proceed through design and construction as outlined in the ESR. Information will be collected in accordance with the Freedom of Information & Protection of Privacy Act. With the exception of personal information, all comments will become part of public record.

ES-2 CLASS ENVIRONMENTAL ASSESSMENT PROCESS

The Municipal Class Environmental Assessment (EA) outlines the procedures to be followed to satisfy requirements of the Environmental Assessment Act for water, wastewater and road projects. This process includes the following five phases:

- Phase 1 Define the Problem
- Phase 2 Identify and Evaluate Alternative Solutions to Determine a Preferred Solution
- Phase 3 Examine Alternative Methods of Implementation of the Preferred Solution
- Phase 4 Document the Planning, Design and Consultation Process
- Phase 5 Implementation and Monitoring

It is also very important to consult the public and agencies during the Class EA planning process.

Class EA projects are further distinguished by four possible 'schedules' depending on the level of impact expected. Schedule A projects represent minor operational and maintenance activities and are approved without the need of further assessment. Schedule A+ projects also represent minor activities and are pre-approved but require public notification prior to project implementation. Schedule B projects require screening of alternative solutions based on their environmental impacts. Phases 1 and 2 must be completed and are typically presented in a report with a Notice of Completion from the project proponent, followed by a 30-day public review period. If no significant impacts are identified and there are no requests for an Order by the Minister under Part II for an Individual EA, then the Schedule B projects are approved and may proceed to Phase 5. Any party may request the Minister of the Environment consider a Part II Order if any outstanding issues remain after the public review period.

Schedule C projects typically have greater potential to impact the environment and must complete all five phases of the Class EA planning process. In addition to Phases 1 and 2, Phase 3 involves the assessment of alternative solutions followed by a public consultation of the preferred design concept. Phase 4 typically entails the preparation of the Environmental Study Report (ESR) to be filed for public review. As long as no significant impacts are identified and no Part II Order is received from the Minister, then Schedule C projects are approved and proceed to Phase 5.

This document is the ESR for wastewater treatment and leachate management for the Town of Petrolia and Waste Management of Canada, respectively, and is classified as a Schedule C Class EA project.

ES-3 PHASES 1 AND 2 OVERVIEW

ES-3.1 PROBLEM/OPPORTUNITY STATEMENT

The Petrolia WWTP is a 3,800 m^3/d extended aeration plant servicing the Town of Petrolia. Most components of the plant are more than 35 years old, and require major upgrading. In addition, a review of the capacity of the plant processes indicates that many processes do not provide adequate capacity to reliably treat the approved flow of 3,800 m^3/d to consistently achieve effluent objectives and effluent compliance. Projected growth for the Town, as well as the significant deficiencies at the plant, require that planning for expansion and upgrade of the plant be initiated through a Schedule C Class Environmental Assessment (EA).

The Petrolia Landfill, owned and operated by Waste Management of Canada Corporation (WM), is located within the Town of Petrolia. The Landfill is equipped with a leachate collection system to collect leachate. This leachate is currently trucked to a number of alternative municipal treatment facilities.

Since the Petrolia Landfill is located a short distance from the Petrolia WWTP, an opportunity exists to direct leachate to the Petrolia WWTP through the current wastewater collection system or a dedicated pipe. Currently the Petrolia WWTP does not have capacity or reliability to accept the additional loadings from leachate.

The Town of Petrolia and Waste Management are both seeking a cost-effective solution to manage their wastewater into the future. One solution that shows significant promise is to co-treat leachate with raw wastewater at the Petrolia WWTP. Planning for the management of wastewater and leachate through the Schedule C Class EA will provide a sound, thorough approach to evaluating a full range of solutions for the Town of Petrolia and Waste Management, considering all potential environmental, community and cost impacts.

ES-4 STUDY AREA

ES-4.1 STUDY AREA

The study area consists of the geographical area that could be affected by the servicing and treatment project alternatives. This area is focused on the urban boundaries of Petrolia and includes a few adjacent properties in the Township of Enniskillen, as shown in Figure ES-1. Petrolia lies within the Sydenham River watershed, and more specifically within two sub-watersheds; Bear Creek Headwaters and Lower Bear Creek.

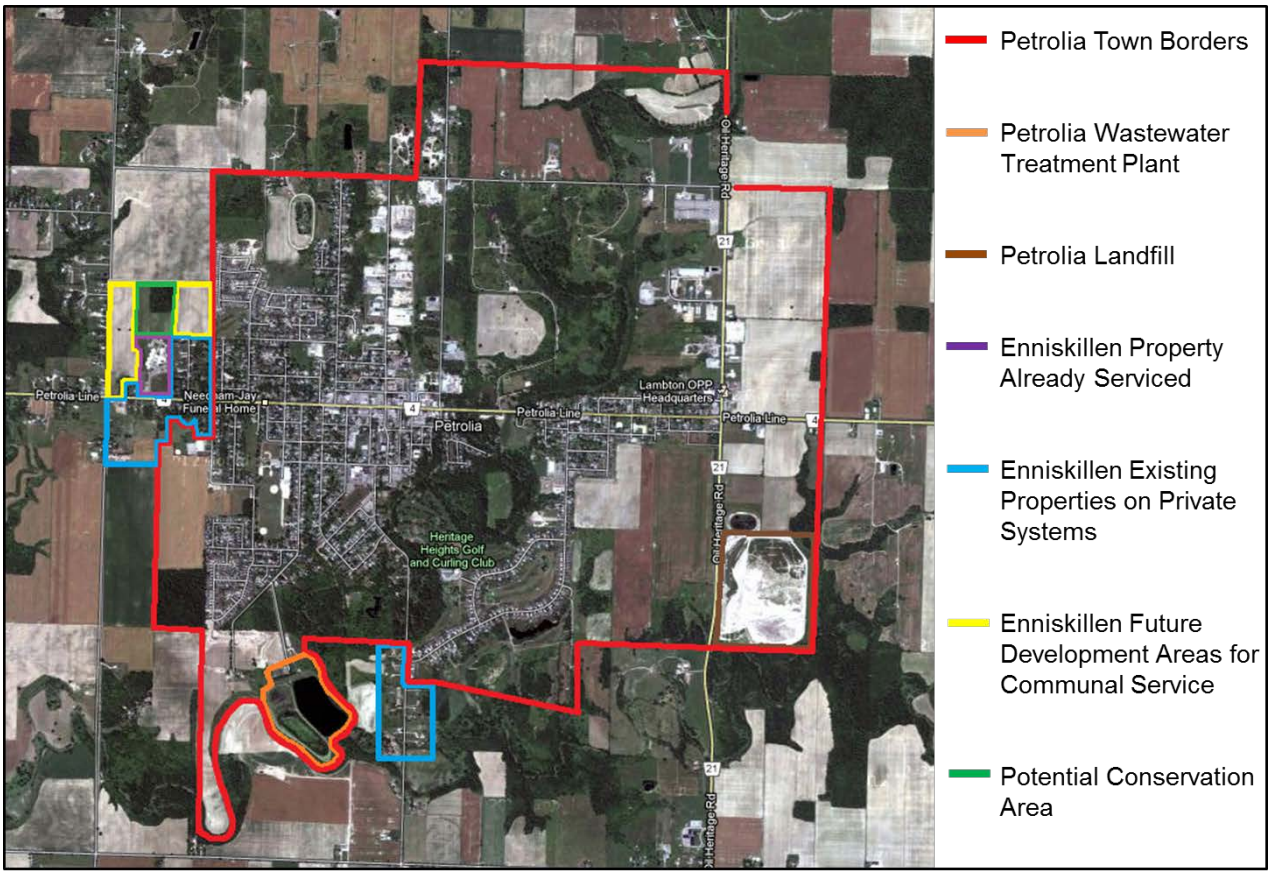

Figure ES-1 Study Area Map

ES-5 DESIGN CRITERIA

The following sections present an overview of the design criteria used to develop the alternative solutions for wastewater treatment and leachate management for the Town of Petrolia and Waste Management, respectively.

ES-5.1 WASTEWATER TREATMENT DESIGN CRITERIA

The average per capita flow in the Town of Petrolia is 556 L/cap.d. This was calculated from the 2008 to 2010 historic monthly average flow at the Petrolia WWTP of 3,028 m^3/d, and an average population in the Town of Petrolia of 5,450 between 2008 and 2010, extrapolated using the growth rate observed in the 2006 census.

From this average per capita flow of 556 L/cap.d and the maximum population projection of 9,216 for the year 2041, the design monthly average flow was determined to be 5,123 m^3/d. This flow is presented in Table ES-1 with the peak day, hourly and instantaneous flow factors.

Table ES-1 2041 Wastewater Flows from the Petrolia Service Area and Peak Flow Factors

Parameters	Factors	Flows (m^3/d)
Monthly Average Flow	1	5,123
Peak Day Flow	2.7[1]	13,833
Peak Hourly Flow	3.2[2]	16,394
Peak Instantaneous Flow	4.0[3]	20,492

Notes:
1 Calculated from historic maximum day flow and monthly average flow at the Petrolia WWTP.
2 Based on the peak day flow plus 20% to allow for diurnal variation.
3 Typical peak instantaneous factor.

Historic concentration and flow data at the Petrolia WWTP from 2008 to 2010 were used to determine the 2041 design loadings based on the monthly average flow rate of 5,123 m^3/d. The data are presented in Table ES-2.

Table ES-2 2041 Petrolia Wastewater Concentrations and Loadings

Parameters	Design Concentrations (mg/L)	2041 Monthly Average Flow (m^3/d)	2041 Design Loadings (kg/d)
5-Day Biochemical Oxygen Demand (BOD_5)	226	5,123	1,158
Total Kjedhal Nitrogen (TKN)	37.6		193
Total Suspended Solids (TSS)	199		1,020
Total Phosphorous (TP)	5.6		28.7

ES-5.2 LEACHATE MANAGEMENT DESIGN CRITERIA

Waste Management anticipates that the Petrolia Landfill will close in 2012 and the volume of leachate generated will begin to decrease from 20,000 m^3 to 5,000 m^3 in 2020, at which point it will continue to be generated at about 5,000 m^3 per year until the end of the planning period in 2041. The closure of the Petrolia Landfill has been delayed in the past, therefore in an effort to remain conservative a second scenario is proposed where the landfill closure is delayed by 3 years to 2015.

Historic leachate hauling volumes were provided by Waste Management. Due to the high variability in the leachate hauling volume data, a monthly average flow, maximum day flow and maximum week flow of leachate from the Petrolia Landfill are presented in Table ES-3.

Table ES-3 Leachate Design Flows

Parameter	Volume of Leachate Shipped
Monthly Average Flow (m^3/d)[1]	68
Maximum Day Flow (m^3/d)[1]	239
Maximum Week Flow (m^3/d)[1]	140

Notes:
1 Based on daily leachate shipping volumes from 2010 to October 2011, however leachate was not hauled every day.

It is anticipated that leachate quality will remain relatively unchanged during the site operating period and then begin to decrease in concentration after closure. A leachate sampling program was implemented on October 19, 2011 and will run for a minimum of 45 weeks. Traditional wastewater parameters are sampled weekly while metals are sampled once per month. To date, 26 samples have been collected, 7 including metals. Table ES-4 presents the leachate design loadings based on the monthly average, maximum day and maximum week flows.

Table ES-4 Leachate Design Concentrations and Loadings

Parameters	Historic Average Concentrations (mg/L)	Design Average Loadings at a Flow of 68 m^3/d (kg/d)	Design Maximum Day Loadings at a Flow of 239 m^3/d[1] (kg/d)	Design Maximum Week Loadings at a Flow of 140 m^3/d[1] (kg/d)
BOD_5	494	34	118	70
TKN	906	62	217	127
TSS	42	2.9	10.1	5.9
TP	2.8	0.19	1.18	0.40

Notes:
1 Based on daily leachate shipping volumes from 2010 to October 2011, however leachate was not hauled every day.

ES-6 EVALUATION METHODOLOGY

For the evaluation of the alternative solutions, a Triple Bottom Line (TBL) evaluation methodology is proposed. This methodology is designed to select a preferred solution that balances the criteria of environmental protection, minimizing community impacts, and minimizing economic impacts (costs).

A weighting and ranking system is proposed in order for the evaluation to be systematic, rational and reproducible in comparing the alternatives and identifying the preferred solution. For this project, we are proposing that environmental and community goals are equally weighted at 40% as they each are defined by more indicator criteria, and the economic goal be weighted less at 20% as it is defined by fewer indicator criteria.

A preliminary set of indicator criteria grouped by the Triple Bottom Line categories, each with a short description, proposed to rank the alternative solutions, are listed in Table ES-5. Also shown in Table ES-5 is the value weighting of each criterion.

Table ES-5 Evaluation Criteria Used in Evaluation

Indicator Criteria	Goal	Importance	Prorated Value Weight
Protect Environment (40%)			
Surface Water Protection	Maximize reliability in achieving effluent quality limits under all average and peak flows and loadings to the plant	High	7.3%
Greenhouse Gasses	Minimize greenhouse gas generation or net energy use	High	7.3%
Operating Complexity	Minimize risks to reliability and performance with a system that is simple	Medium	3.6%
Chemical Use	Minimize use of chemical additives	Medium	3.6%
Environmental Risk During Construction	Minimize risk of impacts to surface water, groundwater, land, terrestrial resources and aquatic habitats during construction	Medium	3.6%
Treatment Plant Performance Risk During Construction	Minimize potential risk to performance and plant operations during construction	High	7.3%
Spills	Minimize potential risks to surface water and land due to spills	High	7.3%
Minimize Community Impacts (40%)			
Aesthetics	Maximize aesthetic appeal of the structures and area	High	6.2%
Land Use	Maximize land use to preserve site area for any future requirements	Medium	3.1%
Health and Safety	Maximize protection of public/operator health and safety from exposure to gaseous emissions, toxic organics or processing chemicals	High	6.2%
Operations and maintenance staff	Minimize operations certification and training requirements	Medium	3.1%
Odours	Minimize potential for odours affecting the community	High	6.2%
Noise	Minimize potential for noise affecting the community	High	6.2%
Traffic & Safety	Minimize truck traffic and during construction and operation and maximize community safety	High	6.2%
Construction Duration	Provide the shortest possible construction schedule and operational impact to neighbouring areas and operators	Medium	3.1%
Minimize Economic Impacts (Costs) (20%)			
Capital Costs	Minimize capital costs	High	8.0%
Operations and Maintenance Costs	Minimize operations and maintenance costs	High	8.0%
Operating Risks	Minimize operating cost risk due to dependence on electricity, fuels, chemicals or other on-going costs	Medium	4.0%

ES-7 DEVELOPMENT AND SCREENING OF ALTERNATIVE SOLUTIONS

ES-7.1 WASTEWATER TREATMENT

Four options were considered in determining the future of Petrolia's wastewater management and these options are outlined in Table ES-6.

Table ES-6 List of Petrolia Wastewater Management Options

Option	Option	Description
1	Do Nothing[1]	• No change to the existing Petrolia WWTP
2	Limit Community Growth[1]	• Upgrade of the existing Petrolia WWTP • No expansion of the existing Petrolia WWTP
3	Expansion and Upgrade of the Petrolia WWTP on the Existing Site	• Upgrade of the existing Petrolia WWTP • Expansion of the existing Petrolia WWTP to provide capacity for growth in the Town
4	Construction of a New Wastewater Treatment Plant on a New Site	• Upgrade of the existing Petrolia WWTP • Construction of a new wastewater treatment plant to provide capacity for growth in the Town

Notes:
1 These solutions are required to be considered by the Municipal Class EA.

Based on the descriptions above, the only feasible solution for servicing existing and future growth over the planning period is the upgrade and expansion of the Petrolia WWTP on the existing site.

ES-7.2 LEACHATE MANAGEMENT

Four options were considered for the future treatment of leachate from the Petrolia Landfill. These options are listed in Table ES-7. The following sections present a description of these options.

Table ES-7 List of Leachate Management Options

Option	Option	Description
1	Do Nothing[1]	• Continue to haul leachate for treatment at various alternative wastewater treatment facilities
2	Haul Leachate to the Petrolia WWTP	• Haul leachate to the Petrolia WWTP for treatment
3	Discharge Leachate to the Petrolia Sewage Collection System	• Build a pumping station at the Petrolia Landfill • Install a forcemain to connect the Petrolia Landfill to the Petrolia sewage collection system
4	Discharge Leachate Directly to the Petrolia WWTP	• Build a pumping station at the Petrolia Landfill • Install a forcemain to connect the Petrolia Landfill directly to the Petrolia WWTP

Notes:
1 This solution is required to be considered by the Municipal Class EA.

A comparative evaluation of leachate management options was completed using the criteria and ranking to score each option out of 100%. Option 3, connecting the Petrolia Landfill to the Petrolia collection system, and upgrading the Petrolia WWTP to accommodate leachate loadings, scored highest in both the community and economic categories, and had similar scores to other options in the environmental category.

ES-8 DESIGN CONCEPT

The following section outlines the design concepts of the preferred solutions for wastewater treatment and leachate management for the Town of Petrolia and Waste Management of Canada respectively.

ES-8.1 DESIGN CRITERIA

The project will focus on combined design criteria for both wastewater from the Town of Petrolia and leachate from the Petrolia landfill. These combined concentrations and loadings are presented in Table ES-8.

Table ES-8 Combined Wastewater and Leachate Design Concentrations and Loadings

Parameters	Petrolia Wastewater Average Concentration (mg/L)	Petrolia Landfill Leachate Peak Concentration (mg/L)	Combined Wastewater & Leachate Concentration (mg/L) [1,2]	Combined Wastewater & Leachate Loadings (kg/d)[3]
BOD_5	226	494	234	1,232
TKN	37.6	906	60.7	320
TSS	199	42	195	1,027
TP	5.6	2.8	5.6	29.5

Notes:
1 Petrolia wastewater design flow based on a 2041 monthly average flow of 5,123 m^3/d.
2 Petrolia landfill leachate design flow based on a weekly maximum of 140 m^3/d.
3 The combined wastewater and leachate design flows amounts to 5,263 m^3/d.

The design flows used to size specific unit processes is presented in Table ES-9. The design flows were calculated based on multiplying the monthly average flow (5,123 m^3/d) with the peak factor and adding 140 m^3/d to account for the peak leachate flow, which does not correspond to the wastewater peak factor.

Table ES-9 Design Flows for each Unit Process

Unit Process	Monthly Average Flow (m^3/d)	Wastewater Peak Factor	Peak Leachate Flow (m^3/d)	Design Flow (m3/d)[1]
Headworks	5,123	4[2]	140	20,632
Aeration Tanks		1		5,263
Oxygenation		1		5,263
Secondary Clarifiers		3.2[3]		16,534
RAS Pumping		1		5,263
Tertiary Filtration		3.2[3]		16,534

Notes:
1 Calculated by multiplying the monthly average flow by the wastewater peak factor than adding the peak leachate flow.
2 Peak instantaneous flow.
3 Peak day flow plus 20% to allow for diurnal variation.

An Assimilative Capacity Study was completed in 2012 to present rationale for updating the effluent criteria of the upgraded and expanded Petrolia WWTP, and can be found in Appendix 2. The recommended effluent criteria are presented in Table ES-10. The plant will continue to have requirements for tertiary phosphorus removal, as well as year round nitrification.

Table ES-10 Recommended Certificate of Approval Effluent Objectives and Limits for the Upgraded and Expanded Petrolia WWTP[1]

Parameters	Effluent Objectives		Effluent Limits[2]	
	Concentration (mg/L)	Waste Loading (kg/d)	Average Concentration (mg/L)	Average Waste Loading (kg/d)
5 Day Biochemical Oxygen Demand (BOD_5)	5.0	25.6	10.0	51.2
Total Ammonia Nitrogen				
May 1 – Nov. 30	2.0	10.2	3.0	15.4
Dec. 1 – Apr. 30	4.0	20.5	6.0	30.7
Total Suspended Solids (TSS)	5.0	25.6	10.0	51.2
Total Phosphorous (TP)	0.37	1.9	0.74	3.8
E. Coli (Apr. 1 – Nov. 30)	150 organisms / 100 ml		200 organisms / 100 ml	
pH (at all times)	6.5 – 8.5		6.0 – 9.5	

Notes:
1 Based on a monthly average flow of 5,123 m^3/d.
2 Monthly average concentrations and loadings shall not exceed the effluent limits.

ES-8.2 UNIT PROCESS REQUIREMENTS

The following section provides more detail on the upgrades and expansion required at the Petrolia WWTP based on the design criteria. Table ES-11 summarizes the required upgrades.

Table ES-11 Summary of the upgrade and expansion requirements for the Petrolia WWTP

Process	Existing		Upgrade and Expansion
Headworks - Screens			
Type	Step Screen	Coarse Bar Rack	Replace existing with a new step screen
Number	1	1	1
Capacity	6,000 m^3/d	12,000 m^3/d	20,632 m^3/d
Headworks - Grit Collection			
Type	Aerated grit tank		Replace existing with a vortex grit collector
Number	1		1
Capacity			16,534 m^3/d
Aeration Tanks			
Number	2 existing aeration tanks		2 additional aerations tanks
Dimensions	24.7 m x 12.2 m x 3.96 m SWD		40.0 m x 8.0 m x 4.0 m SWD (preliminary)
Total Volume	2,388 m^3		2560 m^3
Oxygenation			
Type	Mechanical surface aerator	Self-aspirating jet	Replace existing with a fine bubble aeration system
Number	4	2	3 blowers (2 duty / 1 standby)
Total Capacity	36 kg O_2/h	52 kg O_2/h	327 kg O_2/h
Phosphorous Removal			
Number of Pumps	1 (duty)		Replace existing with 2 (1 duty / 1 standby)
Containment	No		Yes
Secondary Clarifiers			
Type	Square clarifiers with circular scrapers		Upgrade existing Add 2 new rectangular clarifiers
Dimensions	12.2 m x 12.2 m x 3.0 m SWD		4 m x 18 m x 4 m SWD (preliminary)
Total Surface Area	288 m^2		288 m^2
RAS Pumping			
Number	2 (1 duty / 1 standby)		Replace existing with 2 (1 duty / 1 standby)
Total Capacity	3,273 m^3/d		5,123 m^3/d
Tertiary Filtration			
Type	Travelling bridge sand filter		Replace existing with rotating disk filters
Number	1		2
Total Surface Area	31.8 m^2		120 m^2
UV Disinfection			
Type	Low pressure, low intensity		No upgrades or expansions required
Number of Lamps	40 lamps at 26 W per lamp		
UV Output	1040 W total		
Biosolids Holding Tanks			
Number	2		No expansion required
Dimensions	22.25 m by 4.88 m by 3.05 m SWD		
Total Volume	312 m^2		
Aeration Type	Coarse bubble spargers		Replace aeration equipment

ES-8.3 CAPITAL COSTS

The capital cost for the upgrade and expansion of the Petrolia WWTP to treat wastewater and leachate is between $23.4 and 24.1 million. Costs for the treatment of leachate at the Petrolia WWTP will be negotiated between the Town of Petrolia and Waste Management.

Table ES-12 Total Capital Cost to Upgrade and Expand the Petrolia WWTP to Treat Wastewater and Leachate

Process	Estimated Capital Cost	
	Minimum	Maximum
Headworks	$ 3,100,000	$ 3,100,000
Aeration Tanks	$ 2,700,000	$ 2,850,000
Oxygenation	$ 2,700,000	$ 2,900,000
Secondary Clarifiers	$ 1,110,000	$ 1,110,000
Tertiary Filtration	$ 4,000,000	$ 4,000,000
Biosolids Handling Volume	$ 400,000	$ 400,000
Phosphorous Removal	$ 100,000	$ 100,000
Electrical & Controls	$ 1,000,000	$ 1,000,000
Miscellaneous	$ 300,000	$ 300,000
Leachate Forcemain & Pumping	$ 300,000	$ 300,000
Subtotal	**$ 15,710,000**	**$ 16,060,000**
Contingency 35%	$ 5,498,500	$ 5,621,000
Engineering 15%	$ 2,356,500	$ 2,409,000
Total	**$ 23,565,000**	**$ 24,090,000**

ES-3.4 IMPLEMENTATION PLAN

The implementation plan to provide wastewater treatment and leachate management for the Town of Petrolia and Waste Management of Canada, respectively, is outlined below. The entire process is expected to take approximately 3.5 years.

- Stage 1 includes the design of the wastewater treatment plant upgrades and expansion, as well as the collection system to connect the Petrolia Landfill to the Petrolia collection system. The design stage is estimated at 1 year.
- Stage 2 consists of the construction of the wastewater treatment plant upgrades and expansion, as well as the collection system to connect the Petrolia Landfill to the Petrolia collection system. Construction will require two stages outlined below:
- Stage 2.1 will be the construction of a new plant at the Petrolia WWTP site and the connection of the Petrolia Landfill to the Petrolia collection system. This work will require approximately 1.5 years, and must be completed before the existing plant can be taken offline and upgraded.
- Stage 2.2 will be the retrofitting and upgrading the existing Petrolia WWTP and will require approximately 1 year.

ES-8.4 IMPACTS AND MITIGATION MEASURES

Based on the results of the environmental assessment the project impact is considered small during construction and negligible during operation. Best construction practices will be implemented to ensure minimal disruption to the environment and residents during construction phases. The plant will institute the best available treatment technologies to treat Petrolia wastewater and landfill leachate.

A conceptual layout of the plant is presented in Figure ES-2. The existing site does not meet the 100 m minimum separation distance from existing properties and a future development area, but the design will ensure the expanded plant does not decrease the separation. Best design and construction practices will be implemented to ensure the most odorous processes (i.e. headworks) are located as far from existing or future residences as possible. In addition processes will be constructed with the necessary housing and odour control technologies to mitigate any potential odours.

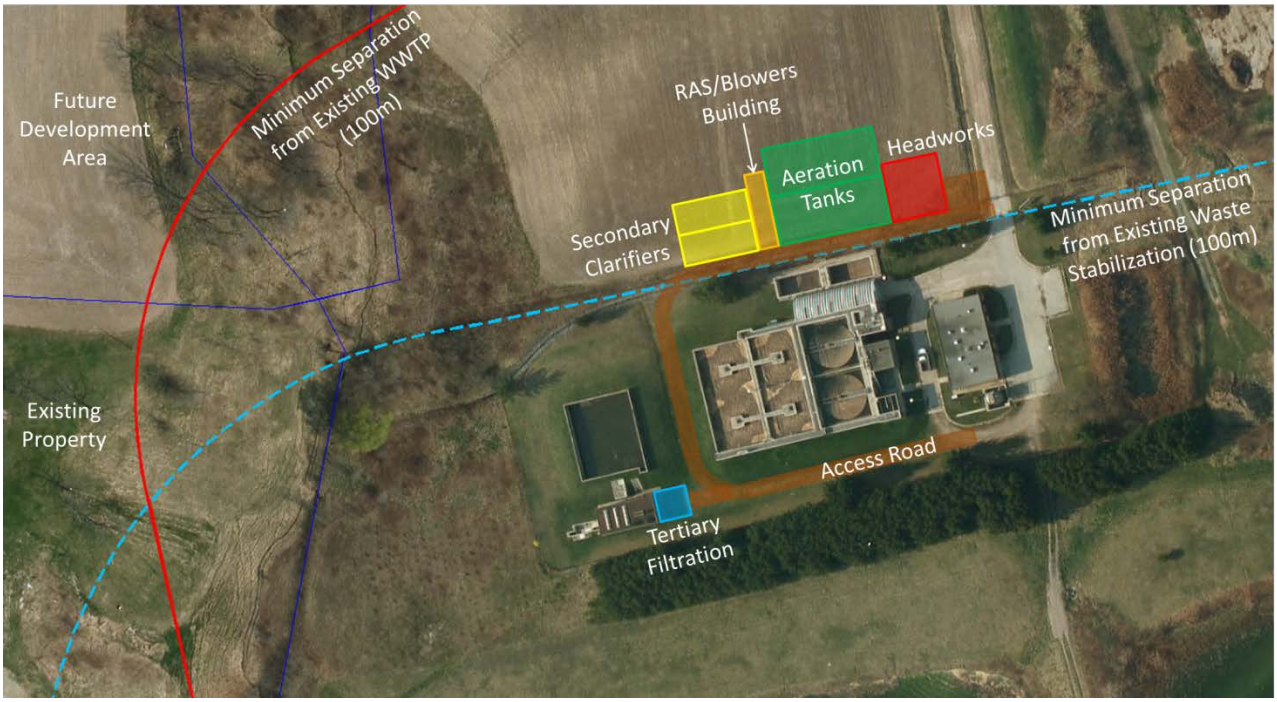

Figure ES-2 Conceptual Layout of the Upgraded and Expanded Petrolia WWTP

ES-9 CONSULTATION

ES-9.1 OVERVIEW

A summary of the public and Aboriginal and First Nations consultation activities undertaken as part of the Class EA process are presented in this section. The public consultation materials are included for reference in Appendix 3.

ES-9.2 OBJECTIVES OF CONSULTATION ACTIVITIES

The objectives of the consultation activities for this project included:

- Inform the public, stakeholders and Aboriginal and First Nations of the project
- Offer educational information regarding the project
- Obtain input on project components at key decision-making points
- Meet or exceed the consultation requirements of the Class EA process.

ES-9.3 DIRECT CONSULTATION ACTIVITIES

The following outlines the specific consultation activities undertaken to support the Class EA process for wastewater treatment and leachate management for the Town of Petrolia and Waste Management of Canada.

- **Notice of Study Commencement:** A Notice of Study Commencement was placed in the local newspaper, Municipal webpage, Municipal notice board and sent to the project mailing list (Issued November 18, 2011).
- **Project Mailing List:** A contact list was developed for the project and continually upgraded as the project progressed. The list included residents, landowners, members of community groups and a number of review agencies, businesses and organizations. Also included were the Aboriginal and First Nations groups identified whose traditional rights may be impacted by the project.
- **Phone Calls:** Aboriginal and First Nations groups were contacted by phone to discuss their interest in the project.
- **Project Website:** Information on the project is posted on the Municipality's website (http://town.petrolia.on.ca/index.php?option=com_content&view=article&id=83), including notices, Technical Memorandums 1 and 2 and the poster boards presented at the Public Open House.
- **Public Open House:** One Public Open House was held on May 1, 2012 between 4 and 7 pm at the Town of Petrolia Municipal Office. The notice for the Public Open House was advertised in the local newspaper, posted on the Municipalities website and sent directly to the contacts on the project mailing list. The Public Open House provided displays for a walk through, comment sheets and handouts. Staff from the Town of Petrolia, Waste Management and CIMA were available to answer any questions.
- **Notice of Completion:** Included as first page of the ESR.

More detailed information on the Public Open House, the materials presented and feedback is included in Appendix 3.