

HASTINGS HIGHLANDS CLASS EA SEPTAGE MANAGEMENT STRATEGY

Evaluation Screening Criteria

December 3, 2011
Stakeholder Workshop



BACKGROUND

- In December 2010 the Municipality of Hastings Highlands initiated a Municipal Class EA planning and design process
- In response to the Public Information Centre (PIC) held July 5, 2011 and filing the Preliminary Project File July 6, 2011 the municipality has received significant public comment.
- The Papineau Lake Cottagers' Association (PLCA) retained legal representation, and suggested that a Stakeholder Workshop be used to define evaluation criteria.
- A draft Consultation Program was prepared by Jp2g July 18, 2011 – and reviewed by Council at a meeting August 17, 2011.
- The August 31, 2011 Work Plan prepared by the Consultant Team proposed a Workshop as a consultation activity.
- A Request for Public Input for this Workshop was placed on the website and sent to cottage and business associations on November 2, 2011, and published in the paper November 10 and 17, 2011.

WHAT IS A STAKEHOLDER WORKSHOP?

To obtain public input in an effective and efficient manner to assist the municipality to make informed decisions.

Public – the composition of the interested persons should generally reflect the community as a whole.

Effective and Efficient Manner – to facilitate the presentation of key issues (ie. define environmental screening criteria) and help the group to achieve the workshop objectives the consultant will guide the participants through various steps. The facilitator will be content neutral.

Decisions – to find proposals which are acceptable enough to all participants at the time of the discussion and after they leave the workshop.

Note: All decisions made in the Workshop will be presented to Council for consideration and their decision will be subject to further agency and public review.

WORKSHOP OBJECTIVES

- Introductions (10:00 – 10:15 am)
- Municipal Class EA Overview (10:15 – 10:30 am)
- Alternative Approaches (10:30 – 12:15)
 - Characterization of Septage
 - Overview of Approaches
 - Define Screening Criteria
 - Rationalize Weighting Factors

LUNCH – Evaluate Approaches (12:15 – 1:00 pm)

- Alternative Sites (1:00 – 3:00 pm)
 - Overview of Candidate Site Selection Process
 - Results of Request for Interest 3 Candidate Sites
 - Define Environmental Screening Criteria

INTRODUCTIONS

- Please state your name and where you live
- If you live outside Hastings Highlands where is your residence/business in the municipality?
- If you wish, please state your occupation and/or place of work
- Why are you attending this Stakeholder Workshop?
- What issue or issues are most important to you?

Note: Please make sure you fill in the Attendance Sheet and indicate the best means of corresponding with you in the future.

THE MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PLANNING AND DESIGN PROCESS

What is a Municipal Class EA? – describes a planning and design process for a ‘class’ of projects, and if followed by the municipality it will satisfy the requirements of the Environmental Assessment Act.

KEY FEATURES OF ENVIRONMENTAL PLANNING

The Class EA adopts 5 features which are key to successful planning under the requirements of the EA Act.

1. Consult with affected parties.
2. Consider reasonable alternatives.
3. Consider all aspects of the environment.
4. Systematically evaluate net environmental effects.
5. Provide clear complete documentation.

THE PLANNING AND DESIGN PROCESS

- Five (5) Phases
- Discretionary and Mandatory Public Contact
- Agency Consultation
- Notice Requirements and a Minimum 30 Calendar Day Review Period
- Schedule A, B and C Project Types
- Part II Order

Further detail can be found in the Municipal Class Environmental Assessment prepared by the Municipal Engineers Association, June 2000.

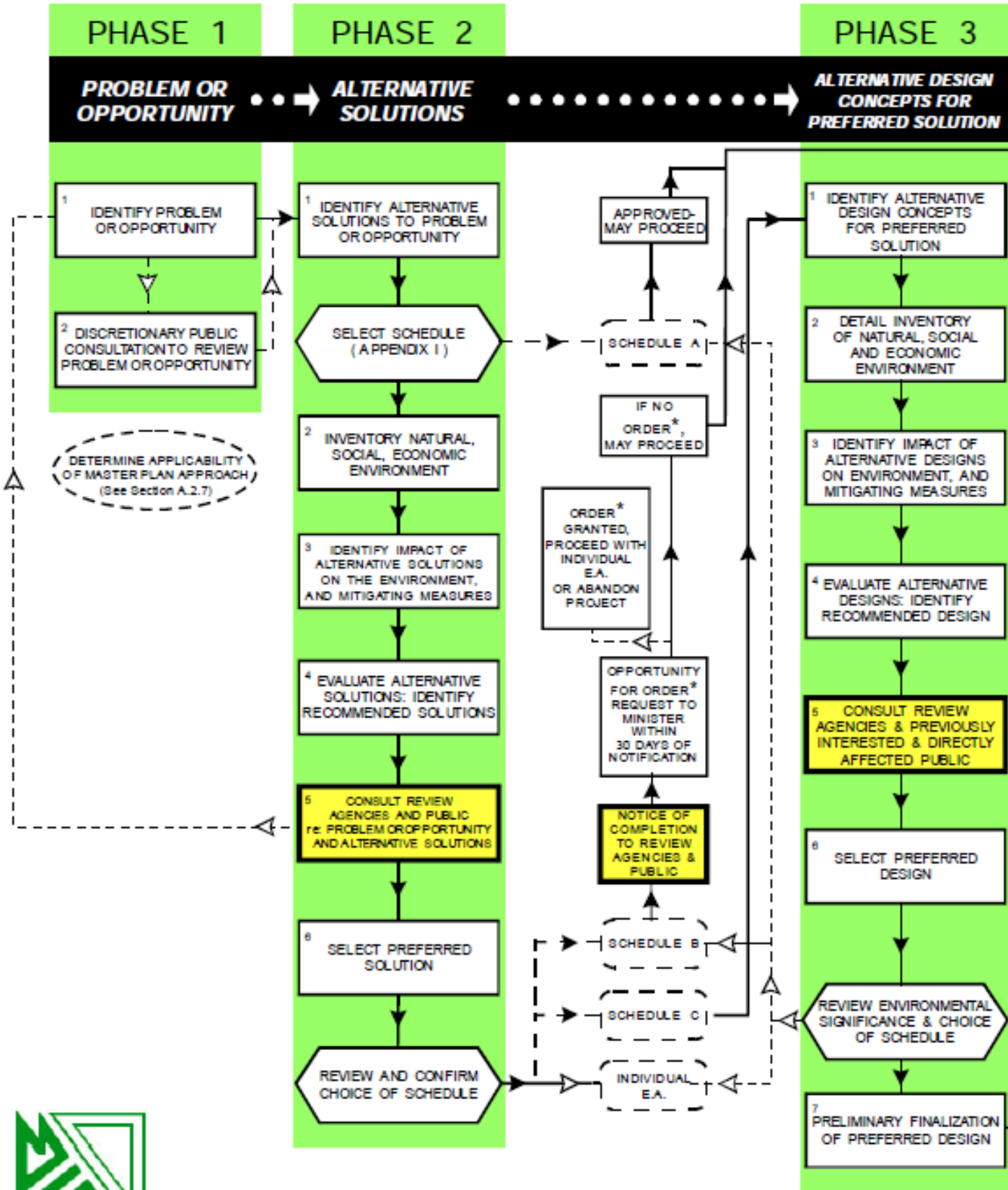
WHAT IS A PART II ORDER?

- Under the provisions of the EA Act there is an opportunity for the Minister of the Environment to review the status of the project.
- Members of the public, interest groups and review agencies may request the Minister to comply with Part II of the EA Act.
- For the Schedule B projects a concern should be brought to the attention of the proponent in Phase 2. If a concern is not resolved, a written request must be submitted to the Minister within the 30-calendar day review period after the Notice of Completion is filed.
- For Schedule C Projects a concern should be brought to the attention of the proponent in Phase 2 to 4. If a concern is not resolved a written request must be submitted to the Minister within the 30-calendar review period after the ESR is filed
- Upon receipt of a request the EAA Branch has 45 days to prepare a report to the Minister.
- If the EAA Branch requests additional information from the proponent, the 45-day period no longer applies.
- The Minister has 21 days after receipt of the EAA Branch recommendation to make a decision.

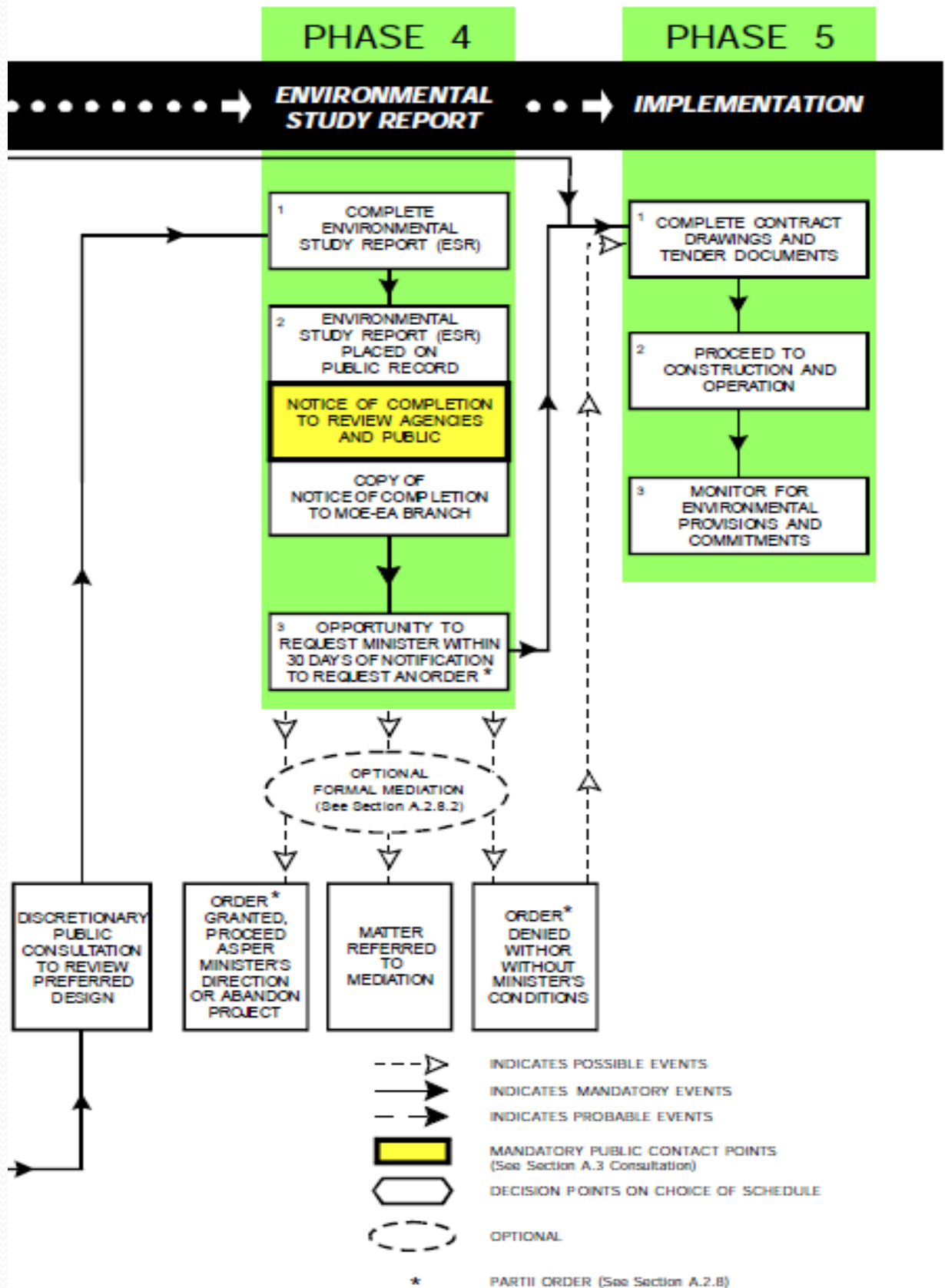
DECISIONS MAY INCLUDE:

- | | |
|-----------------------------|---|
| <i>DENY</i> | - deny the request for an order
- deny with conditions |
| <i>MEDIATION</i> | - under Section 8 of the EA |
| <i>PART II ORDER</i> | - prepare an individual EA |

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS



MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS



Septage Management Strategy

ALTERNATIVE APPROACHES

CHARACTERIZATION OF HASTINGS HIGHLAND SEPTAGE

- Assumed 4570 systems or holding tanks pumped every 5 years
- $915 \times 4\text{m}^3 = 3660\text{m}^3$
- April – October (213 days) = $17.2\text{m}^3/\text{day}$

THE APPROACHES

1. Do Nothing / Use Private Contractor
- 2A. Municipal Sewage Treatment Plant
- 2B. Municipal Sewage Treatment Plant Co-Treatment
- 3A. Alkaline Stabilization – Truck
- 3B. Alkaline Stabilization – Facility
4. Composting
5. Stabilization Lagoons
6. Dewatering Trenches
7. Geotube Technology

ADDITIONAL APPROACHES

- Based on Public Input the evaluation will also include:
8. Dewatering Trucks
 9. Incineration

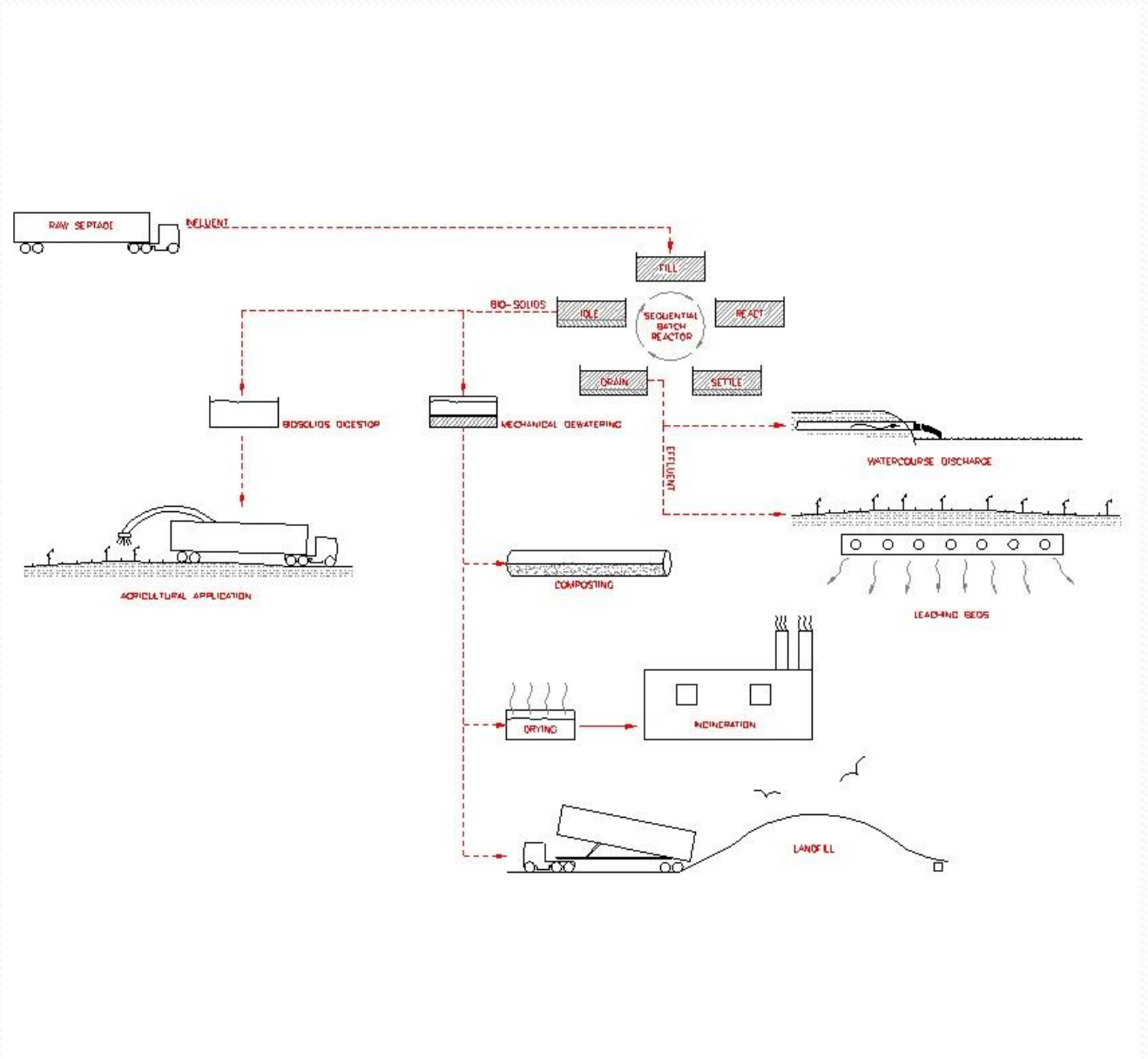
1. DO NOTHING / PRIVATE CONTRACTOR

- **Overview:** Presently everyone calls for a private contractor to collect and arrange for the proper disposal of the septage → nutrient source for agricultural fields
 - Since 2003 under the NMA the Province has indicated that the land application of untreated septage will be prohibited
 - The Provincial Policy Statement 2005, requires that sufficient reserve sewage system capacity is required in a municipality to permit future development
 - The Do Nothing Alternative is not an option. In response to the Request for Interest, a contractor has indicated interest to develop and operate the preferred septage disposal option
- **Land Needs:** The contractor has indicated willingness to lease property for the solution.
- **Potential for Future Expansion:** The expansion of the solution would depend on the agreement with the contractor.
- **Ease of Implementation:** The municipality would obtain EA approvals and all other applicable approvals, the contractor will develop and operate the solution under an agreement with the municipality.
- **EA Approval Requirements:** subject to the alternative selected.
- **Owner Manageability:** The municipal control would be limited to the terms and conditions of the agreement.
- **Annualized Costs:** To be determined.

2A. MUNICIPAL SEWAGE TREATMENT PLANT (SBR)

- **Overview:** A Sequential Batch Reactor (SBR) is a form of the activated sludge treatment process. This type of system configuration consists of a septage holding tank followed by a reactor tank (SBR unit) in which several process stages occur. SBR's typically have five-stage cycles, including: (1) Fill; (2) React; (3) Settle; (4) Draw; and (5) Idle
- **Land Needs:** The land required for the installation of a septage SBR plant would be approximately 150m X 150m (2.25ha). For subsurface discharge the size of the bed will highly depend on the percolation rate of the soil and the area required may vary from 2.0 ha to 4.0ha. Alternatively the effluent is discharged to a waterbody.
- **Potential for Future Expansion:** If the population was to grow, the plant as well as the effluent discharge area (i.e. leaching bed) would also require a proportional increase in land to that of the population
- **Ease of Implementation:** The implementation of a new SBR plant and discharge bed/field would require detailed process review and design. A new plant would require extensive studies (i.e. hydrogeological, geotechnical, environmental)
- **EA Approval Requirements:** A new plant would require MOE Class EA Schedule "C" approval in addition to extensive studies to support design and operations approvals.
- **Owner Manageability:** The Municipality would have complete control of the plant process, however they would still rely on haulers to offload septage at the plant and dispose of the biosolids created during the treatment process.
- **Annualized Cost:**
Capital Cost - \$1.5 million to \$2 million
Operational Costs - \$150,000 - \$200,000 a year

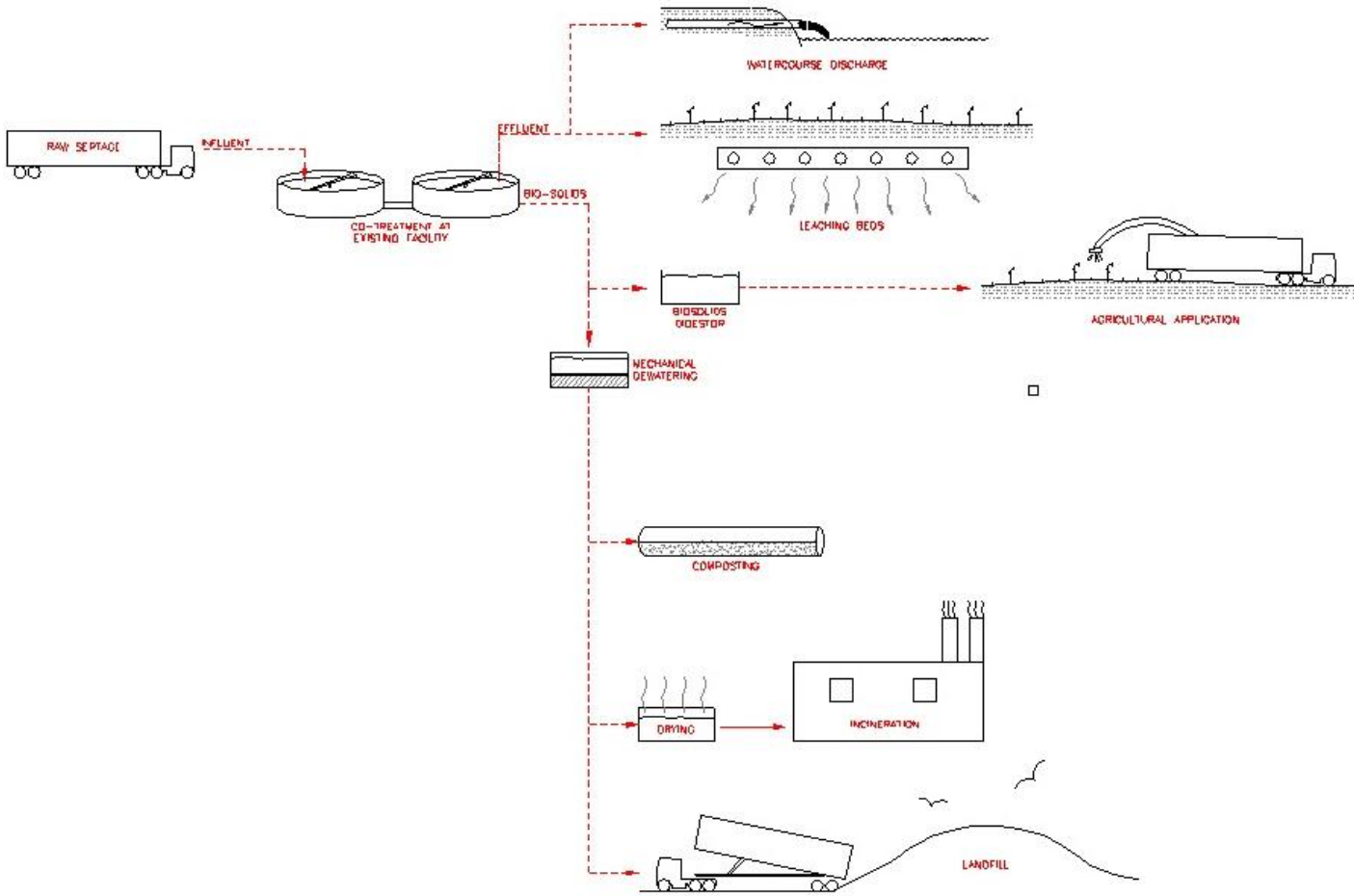
Municipal Sewage Plant (SBR)



2B. MUNICIPAL SEWAGE TREATMENT PLANT (CO-TREATMENT)

- **Overview:** This option calls for the co-treatment of septage at the Bancroft Wastewater Treatment Plant (WWTP) facility. The Bancroft facility would be responsible for the discharge of the effluent and the disposal of all sludge generated from the process.
- **Land Needs:** If the Bancroft facility does not have enough land to accommodate the additional tank and equipment required to accommodate the septage treatment the Municipality of Hastings Highlands may be responsible for purchasing the additional land.
- **Potential for Future Expansion:** The expansion of a plant would depend on the availability of capacity at the Bancroft facility. In addition this would heavily rely on agreements between the two municipalities.
- **Ease of Implementation:** The implementation of the expansion to the Bancroft plant would require detailed process review and design. It would also require extensive studies (i.e. process, geotechnical, environmental). In addition design and construction of the expansion could take a few years (2-3 years).
- **EA Approval Requirements:** A plant expansion to accept septage would require MOE Class EA Schedule “B” approval in addition to extensive studies to support design and operations approvals.
- **Owner Manageability:** The expansion to the Bancroft facility would put all the process control and operation into the hands of the Town of Bancroft. The Municipality of Hastings Highlands would have little influence over operational procedures and control of the plant
- **Annualized Cost:**
 - Capital Cost - \$2 million
 - Operational Costs - \$457,500 a year (based on 915 loads at \$500 ea)

Municipal Sewage Plant (Co-Treatment)



3A. ALKALINE STABILIZATION (TRUCK)

- **Overview:** Lime or alkali is added to the septage to stabilize it prior to land application. The stabilization occurs in a haul truck that is equipped to mix the lime as required.
- **Land Needs:** The land required for the use of a lime stabilization truck is dependent on the agricultural area available for spreading. For land application the size of agricultural fields required to spread the treated septage will be approximately 12.2ha to 36.6ha, depending on the effluent quality, soil characteristics, and the type of crops to be grown.
- **Potential for Future Expansion:** A lime stabilization truck can service approximately 2 septic tanks before it has to dispose of the stabilized septage. Practically the truck would only be able to service approximately 4-6 tanks a day depending on the proximity of the septage loading points to one another, as well as the distance the truck requires to travel to land apply the treated septage. A secondary truck would be required for future expansion or if the truck is out of service for a period of time. Expansion would simply require the purchase of additional trucks.
- **Ease of Implementation:** The implementation of the stabilization truck alternative would require little process review and design. However enough agricultural land for the spreading of the treated septage must be secured.
- **EA Approval Requirements:** The trucks themselves require licensing through MOE approval, the agricultural lands where the treated septage is to be applied must be reviewed and approved by OMAF.
- **Owner Manageability:** Being the Owner of the trucks the Municipality would have complete control of the process, however they would still rely on some storage alternative during the winter months when treated septage cannot be land applied.
- **Annualized Cost:**
Capital Cost: \$500,000 per truck
Operational Costs - \$150,000 - \$150,000 a year

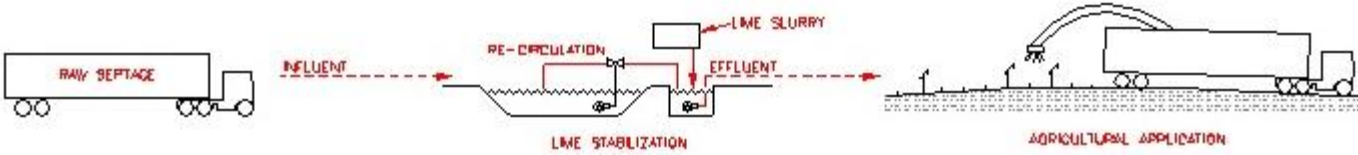
Alkaline Stabilization (Truck)



3B. ALKALINE STABILIZATION (FACILITY)

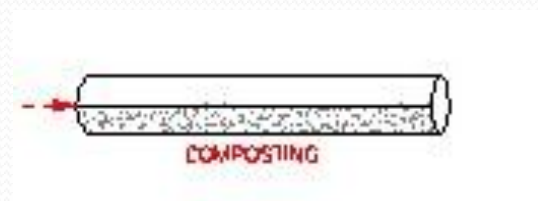
- **Overview:** Lime or alkali is added to the septage to stabilize it prior to land application. The stabilization occurs at a facility equipped with a holding tank and a mixing tank and is equipped to mix the lime as required.
- **Land Needs:** The land required for the facility would be approximately 1.0 ha. In addition the use of a lime stabilization plant is dependent on the agricultural area available for spreading. For land application the size of agricultural field required to spread the treated septage will be approximately 12.2ha to 36.6ha, depending on the effluent quality, soil characteristics and the type of crops to be grown.
- **Potential for Future Expansion:** A lime stabilization facility could be built where there is ample land available for the expansion if required. In addition, locating the plant relative to available licensed agricultural lands should be considered to minimize haulage costs.
- **Ease of Implementation:** The implementation of an alkaline stabilization facility would require detailed process review and design. It would also require extensive studies (i.e. process, geotechnical, environmental). In addition design and construction of the expansion could take a few years (1-2 years).
- **EA Approval Requirements:** A new alkaline stabilization facility would require a MOE Class EA Schedule “C” approval in addition to studies to support the design and operation.
- **Owner Manageability:** Being the Owner of the facility the Municipality would have complete control of the process, however they may still have to rely on another alternative to dispose of the treated septage.
- **Annualized Cost:**
Capital Cost: \$400,000– \$600,000
Operational Costs - \$100,000 - \$150,000 a year

Alkaline Stabilization (Plant)



4. COMPOSTING

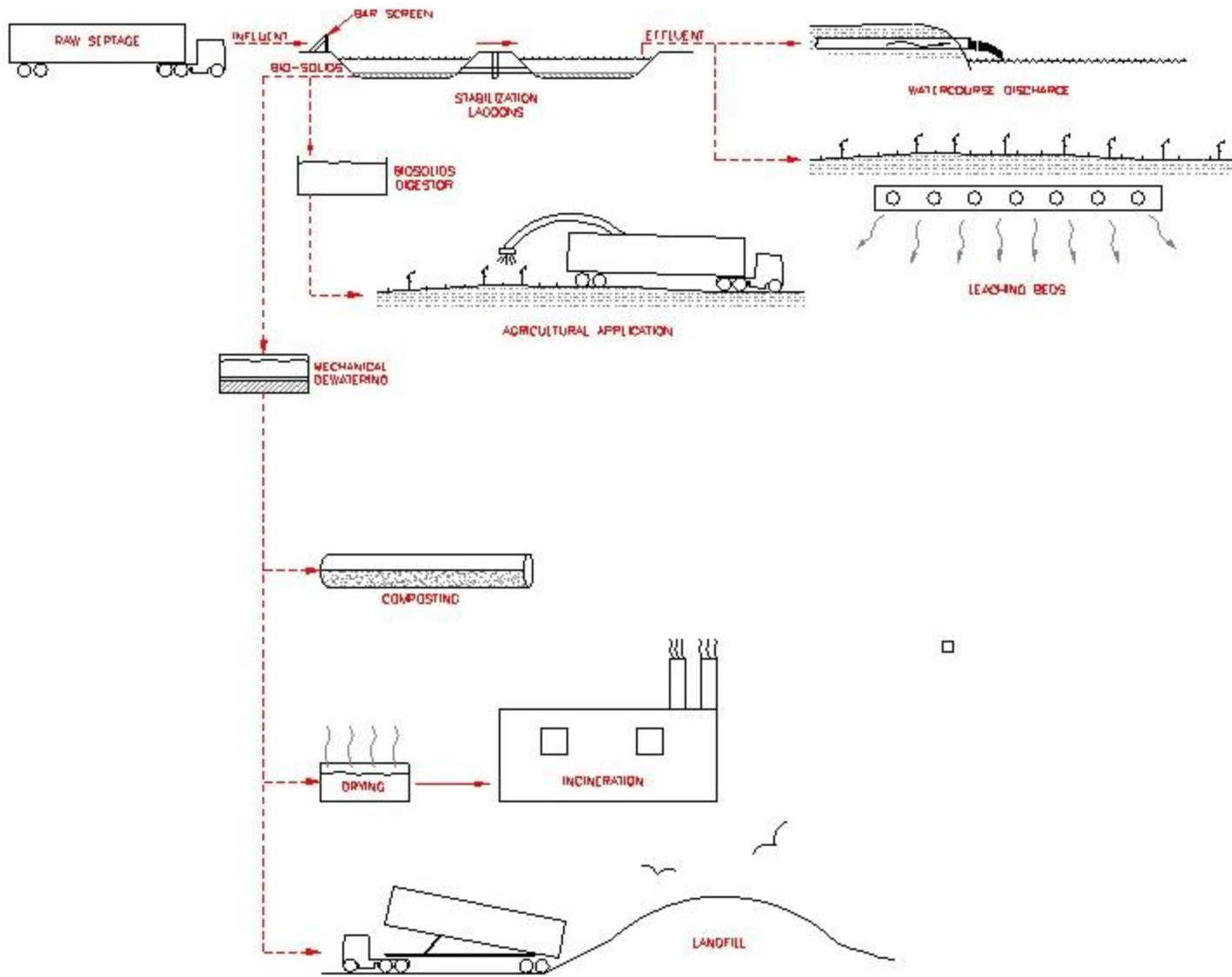
- **Overview:** This method is a secondary treatment process of septage. It requires that the septage be dewatered prior to being used as an additive for composting. Septage is resistant to dewatering, therefore conditioning chemicals are typically added to assist in the process or septage is stored in drying beds or reed beds. Currently no dewatering technology meets the criteria in order to turn septage into compostable material.
- **Land Needs:** N/A
- **Potential for Future Expansion:** N/A
- **Ease of Implementation:** N/A
- **EA Approval Requirements:** N/A
- **Owner Manageability:** N/A
- **Annualized Cost:** N/A



5. STABILIZATION LAGOONS

- **Overview:** Stabilization lagoons may be most suitable for rural areas where large areas of suitable lands are available. Septage Lagoons are typically facultative lagoons that provide full or pretreatment of septage.
- **Land Needs:** A primary septage treatment lagoon with a secondary polishing lagoon, including required set-backs) would be approximately 2.5 ha to 3.5 ha depending on the quality of the septage and the retention time required to stabilize the septage (could take up to 500 days to stabilize the septage).
- **Potential for Future Expansion:** If large tracts of land are readily available additional stabilization lagoons could be built parallel to any existing stabilization lagoons. Alternately the lagoons could be expanded if the existing lot and setback constraints allow for it.
- **Ease of Implementation:** The implementation of septage lagoons would require detailed process review and design. It would also require extensive studies (i.e. process, hydrogeological, geotechnical, environmental). In addition design and construction of the alternative could take a few years (2-3 years).
- **EA Approval Requirements:** New stabilization lagoons would require a MOE Class EA Schedule “C” approval in addition to extensive studies to support the design approvals.
- **Owner Manageability:** Being the Owner of the lagoons the Municipality would have complete control of the process, however they would still rely on haulers to offload septage at the lagoons and dispose of the accumulated biosolids built up during the treatment process.
- **Annualized Cost:**
Capital Cost- \$1 million to \$1.5 million
Operational Costs - \$100,000 - \$150,000 a year

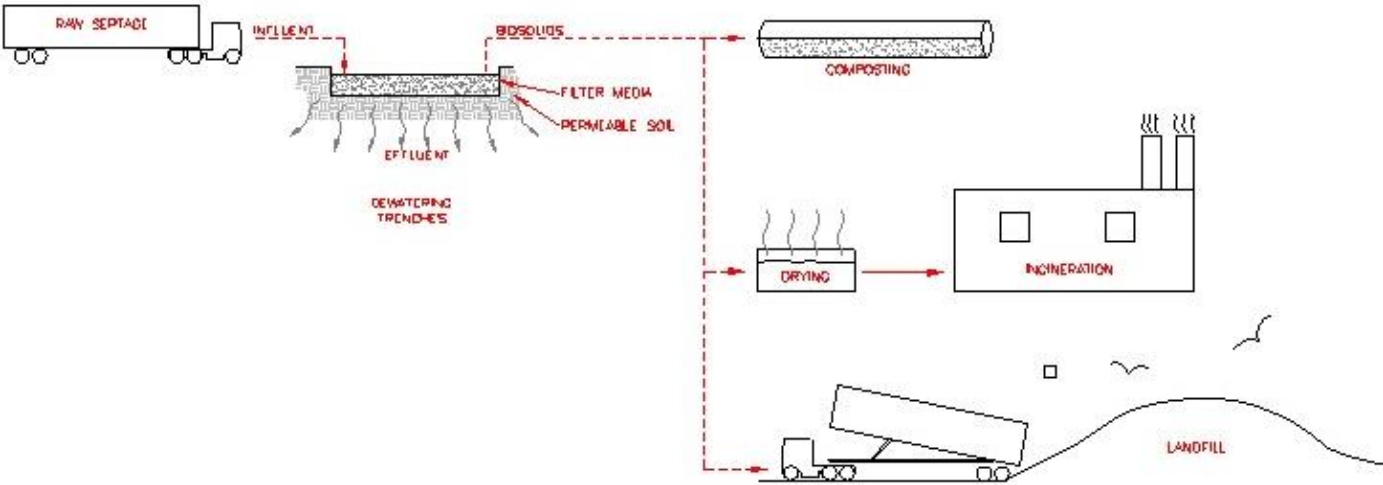
Stabilization Lagoons



6. DEWATERING TRENCHES

- **Overview:** Predominantly in rural parts of Ontario dewatering trenches are used to dispose of septage. A dewatering trench consists of a long, narrow trench that is excavated in permeable soils for the purpose of dewatering septage before final disposal. The separated solids can be disposed of in approved landfill sites or further stabilized and used at certified organic soil conditioning sites.
- **Land Needs:** The land required for the dewatering trenches is highly dependent on the soil percolation rate of the selected site and the attenuation zone required for the trench effluent would be approximately 10 ha to 40 ha. No other land would be required for secondary treatment of the effluent.
- **Potential for Future Expansion:** Expanding the dewatering trenches system can be easily implemented by the addition of more trenches. If land is readily available consideration for future expansion can be incorporated into the initial design.
- **Ease of Implementation:** The implementation of dewatering trenches would require detailed process review and design. It would also require extensive studies (i.e. hydrogeological, geotechnical and assimilative capacity) to ensure that the selected site has an adequate percolation rates and attenuation zone. In addition detailed land acquisition, ministry approval, design and construction of the expansion would take a few years (2-3 years).
- **EA Approval Requirements:** The dewatering trenches would require a MOE Class EA Schedule “C” approval in addition to extensive studies to support the design and operation (i.e. hydrogeological, geotechnical and assimilative capacity).
- **Owner Manageability:** Being the Owner of the system the Municipality would have complete control of the process, however they would still rely on haulers to offload septage at the treatment site and dispose of the accumulated solids as a result of the treatment process. However the dewatering trenches is not a detailed process that requires constant supervision.
- **Annualized Cost:**
 - Capital Cost- \$200,000 to \$300,000
 - Operational Costs - \$60,000 - \$90,000 a year

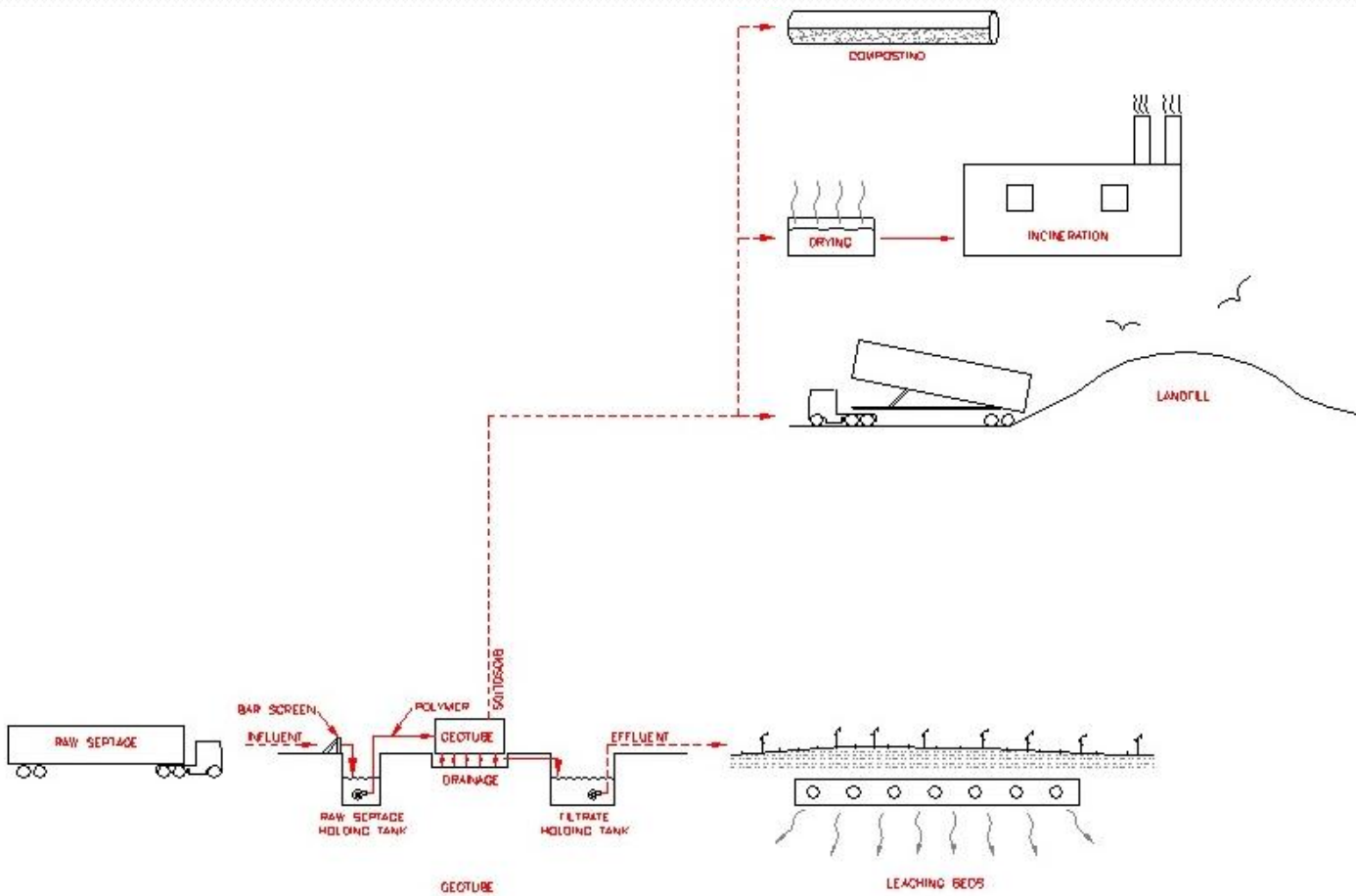
Dewatering Trenches



7. GEOTUBE TECHNOLOGY

- **Overview:** The Geotube is usually placed on top of a drainage bed so that the filtrate can be collected for further treatment or disposal. A polymer is added to help separate the solids from the liquids. Once the septage is dewatered within the Geotube, more septage can be added to the tube and dewatered until the Geotube is full of solids. The Geotube can then be left on the drainage bed for further dewatering and drying that would occur via evaporation in the summer, and the breaking of bonds of solids trapping water through freezing in the winter. Complete dewatering takes between two months and a year.
- **Land Needs:** The land required for the installation of a Geotube system would be approximately 100m x 100m (1.0ha). For effluent discharge leaching beds approximately 5 ha – 10ha should be considered depending on the quality of the soil. Alternatively the effluent could be directed to the sewage treatment plant.
- **Potential for Future Expansion:** Expanding the Geotube system can be easily expanded by the addition of another concrete drainage pad and an additional Geotube. However the expansion of the effluent treatment options as described above should be reviewed prior to the selection of this alternative. If septage leachate beds are considered for the final treatment for the Geotube discharge then the site that is selected should take into consideration enough land to accommodate future expansion.
- **Ease of Implementation:** The implementation of the Geotubes technology would require detailed process review and design. It would also require extensive studies (i.e. process, geotechnical, environmental, assimilative capacity) depending on the final effluent treatment and disposal method selected. In addition detailed design and construction of the expansion would take a few years (2-3 years).
- **EA Approval Requirements:** The Geotubes would require a MOE Class EA Schedule “C” approval in addition to extensive studies to support the design approvals.
- **Owner Manageability:** Being the Owner of the system the Municipality would have complete control of the process, however they would still rely on haulers to offload septage at the treatment site, dispose of the accumulated solids created during the treatment process.
- **Annualized Cost:**
Capital Cost- \$1 million to \$1.5 million
Operational Costs - \$200,000 - \$300,000 a year

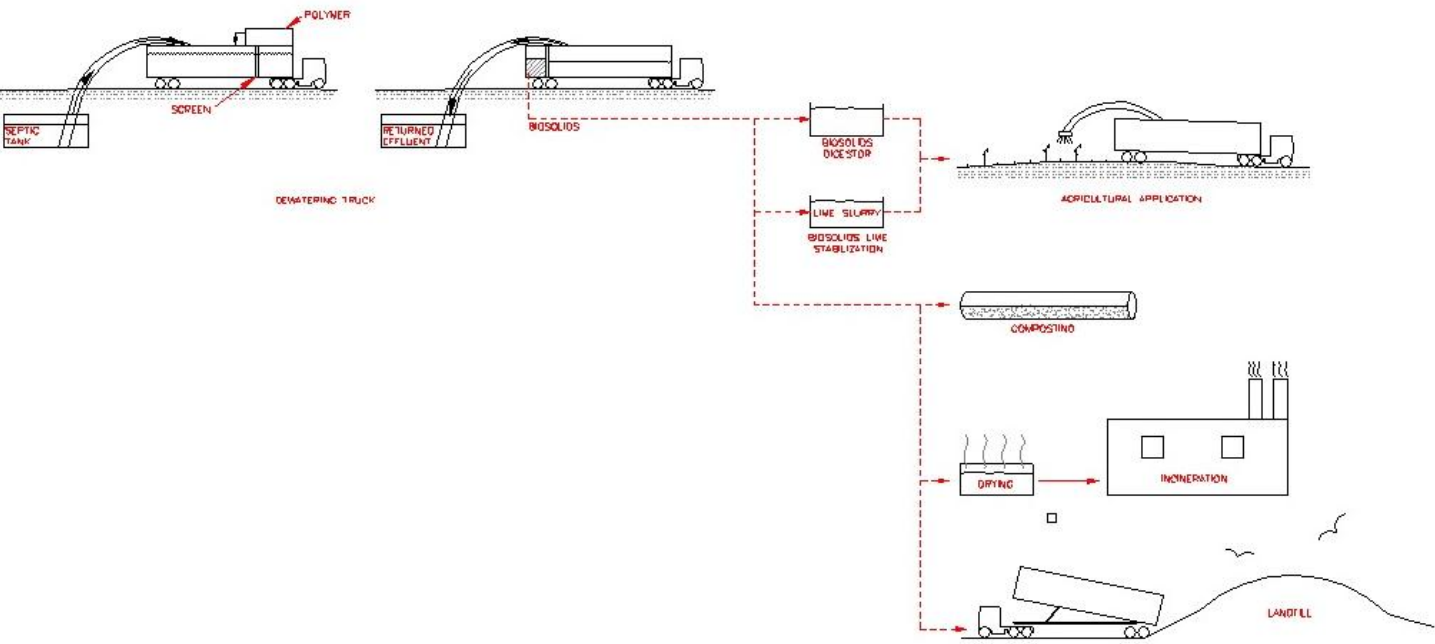
Geotube Technology



8. DEWATERING TRUCKS

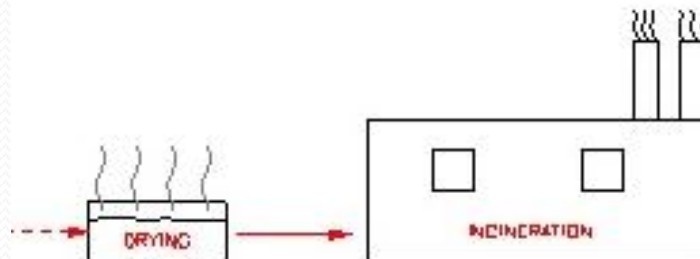
- **Overview:** Septage is collected from septic tanks, dewatered using a dewatering process that includes the addition of a polymer to facilitate dewatering. A single dewatering truck can hold the solids collected from approximately 20-40 septic tanks. Holding tanks would still require the entire contents to be removed.
- **Land Needs:** Dewatering trucks would require the treatment or disposal of solids collected during dewatering. The solids would require being disposed of at a licensed landfill, however no additional land would be required. Septage collected from holding tanks cannot be disposed of at a landfill and must be hauled to an approved site.
- **Potential for Future Expansion:** The truck is advertised to be able to service between 20-40 tanks per day. However this does not take into account the logistics required to do so in a rural community. Unless a series of homes can be sequentially emptied in the same neighbourhood on the same day it is unlikely that this number can be achieved. A more practical number would be approximately 7 tanks per day. Expansion would simply require the purchase of additional trucks.
- **Ease of Implementation:** The implementation of the dewatering trucks would require little process review and design. However it does not address the concern of emptying holding tanks.
- **EA Approval Requirements:** The trucks themselves require licensing through MOE approvals, the solids must be disposed at a certified landfill.
- **Owner Manageability:** Being the Owner of the trucks the Municipality would have complete control of the process, however they would still rely on haulers to dispose of septage from holding tanks all year round.
- **Annualized Cost:**
Capital Cost - \$500,000 - \$750,000
Operational Costs - \$100,000 - \$150,000 a year

Dewatering Trucks



9. INCINERATION

- **Overview:** Upon further dewatering biosolids may be incinerated. The volume of bio-solid mass estimated to be generated on a yearly basis based on 2% TSS is 73.2m³ (mass of 29.3 metric tonnes) with a density of approximately 400.5kg/m³. Dry bio-solids have approximately 11500 kJ/kg heating value. Assuming this is to be incinerated and converted to useable energy (electricity, conversion of apprx 14-28%), this would yield electricity generation of 160kW for approximately one week. Using current FIT values for electricity (49cents per kW-hr) this would generate approximately \$12,848 of income per year. The cost of an incineration/electricity generation system (not including additional drying) would cost approximately \$500,000 and would have a payback time of 38 years and is not considered a fiscally viable alternative.
- **Land Needs:** N/A
- **Potential for Future Expansion:** N/A
- **Ease of Implementation:** N/A
- **EA Approval Requirements:** N/A
- **Owner Manageability:** N/A
- **Annualized Cost:** N/A





DEFINE SCREENING CRITERIA TO EVALUATE ALTERNATIVE APPROACHES

Land Needs – Assess the availability and required footprint to implement each alternative.

Potential for Future Expansion – Considers the flexibility for future upgrades, retrofits and ability to increase capacity for each alternative.

Ease of Implementation – Considers the approvals and construction requirements (including timing) for each alternative.

EA Approvals – Considers the requirements under the Municipal Class EA, and identifies other environmental approval requirements for each alternative.

Owner Manageability – Evaluates the ability of the municipality to have control over the alternative, and the flexibility to react to changing legislative requirements.

Annualized Cost – Considers capital costs to implement and the annual operational costs over the life of the solution.



RATIONALE FOR THE WEIGHTING CRITERIA

- You are asked in a group or individually to determine and rank the importance of each criteria

0.6	Very High Importance
0.4	High Importance
0.2	Moderate Importance
0.1	Low Importance



EVALUATION OF APPROACHES

- During the lunch break you are asked in a group or individually to score each criterion

1	Favourable Impact
2	No Impact
3	Minimal Adverse Impact
4	Moderate Adverse Impact
5	Significant Adverse Impact

Septage Management Strategy

ALTERNATIVE SITES

SITE SELECTION PROCESS

- The Initial 14 Candidate Sites were selected based on:
 - Adjacent to an Existing Waste Disposal Site
 - Adjacent to an Existing Soil Conditioning Site
 - Large Vacant Municipal Landholdings
- A Request for Interest for private landowners was placed on the website November 2, 2011 and published in the paper September 1 and 8, 2011
- In response to the Request For Interest, 3 Additional Candidate Sites have Been Identified
- Based on Public Comments, the municipality has been requested to provide the public with an opportunity to provide input into the definition of screening criteria

SELECTION OF ENVIRONMENTAL SCREENING CRITERIA

- Land Application of Sewage and other non-agricultural source materials is regulated under the Nutrient Management Act (NMA) in reference to the Nutrient Management Act O.Reg 267/03
- Septage Dewatering Trenches are regulated under the Environmental Protection Act (EPA) in reference to the MOE Guide to Disposal of Septage in Dewatering Trenches, 2008
- Approvals are issued by the Ministry of the Environment (MOE) under the EPA through an Application for a Waste Disposal Site.
- Establishment of a Waste Disposal Site is also subject to the County Official Plan and Municipal Zoning By-Law which implements Provincial Policies
- Environmental Criteria can be defined in consideration of:
 - Site Characteristics
 - Minimum Distance Requirements
 - Provincial Planning Policies

Site Characteristics

The site for Dewatering Trenches should exhibit the following:

- A soil matrix which allows liquid-solids separation by exfiltration at an environmentally acceptable inflow rate
- A minimum of 1.5m distance from bottom of trench to watertable
- An area downgradient of the dewatering trenches of suitable size and characteristics to naturally attenuate contaminants to acceptable levels - Reasonable Use Policy Objectives (RUPO)

Minimum Distance Requirements

The site for Dewatering Trenches should be located to cause the least adverse impact to the environment. The NMA and MOE have recommended setback distances. The following slide provides a visual example used in a previous project.

Provincial Policy Statements

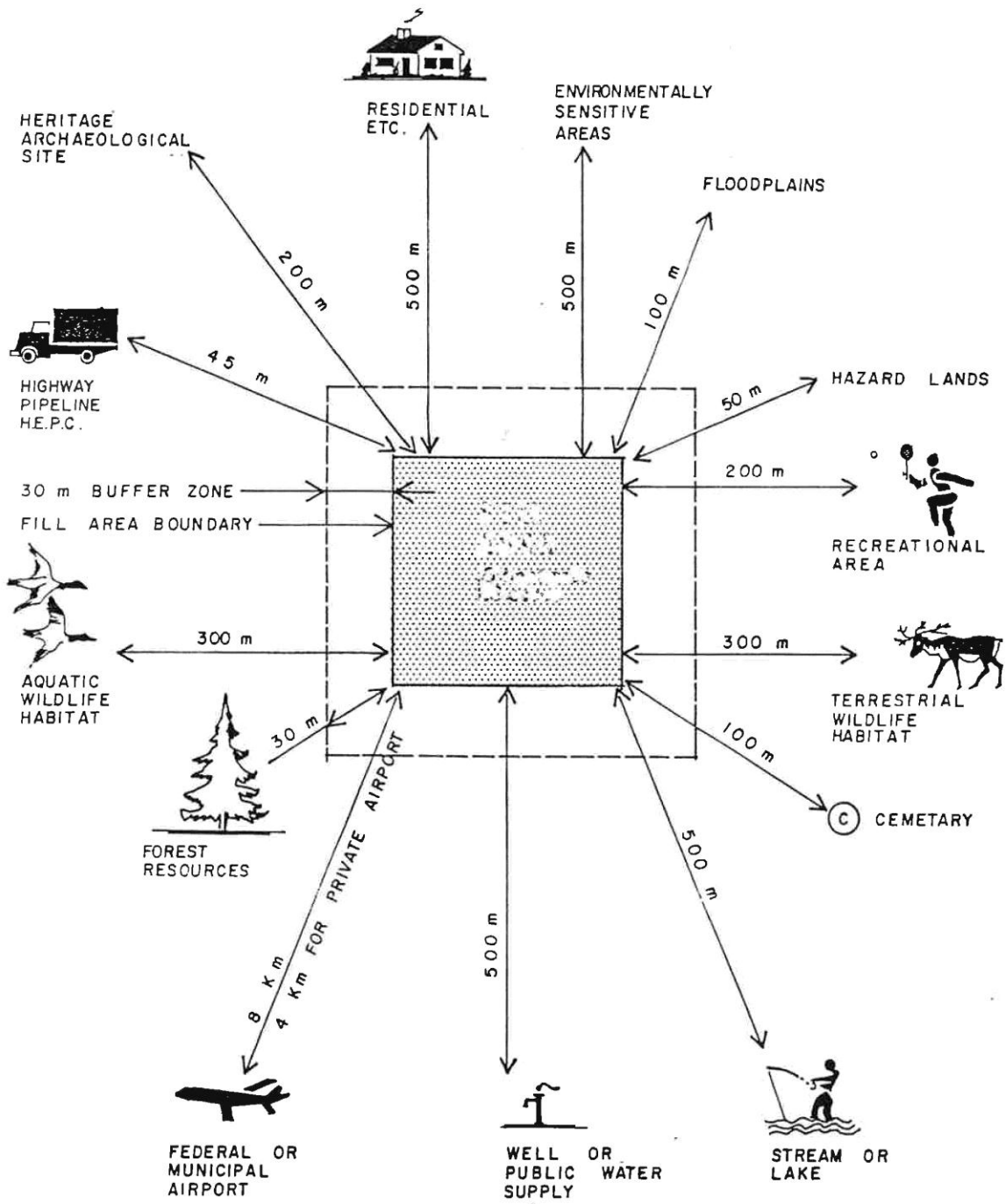
The environment as defined above and in consideration of the effects of the project on persons health & safety and the natural, social, cultural, technical/financial considerations. The criteria have been defined under

Public Health & Safety

Natural Heritage Features and Areas

Social and Cultural Considerations

Technical and Financial Considerations



MINIMUM DISTANCE REQUIREMENTS

Environmental Screening Criteria to Evaluate Candidate Sites for Dewatering Trenches

Environmental Screening Criteria			NMA Regulations	MOE Guidelines	Proposed
Factors	Site Specific				
Public Health And Safety	Effect On Groundwater Supply	Proximity to Wells	15m Drilled Water 90m other well 100m Municipal Well	500m to Residence	500m to Residences Downgradient
		Soil Type Attenuation Capacity	1-50 min/cm Permeable to Medium Permeable	>50 min/cm Not Suitable	Medium Permeability
		Soil Thickness	0.3 – 1.0m		3.0m
		Type of Bedrock			Precambrian Granite
	Effect on Air Quality	Site Operation Dust Odour Noise	90m to Single Residence 450m to Residential Area	500m to Sensitive Land Use	500m to Residences Down wind
		Haul Route Dust Odour Noise			Maintenance Requirements
	Effect on Safety	Proximity to Floodplain	No Construction		Water Setback
		Active Site Operation			Fencing
		Site Access Road			Traffic Analysis
	Natural Heritage Features And Areas	Effect On Water Quality	Proximity to Major Surface Water	20m	500m
Depth to Water Table			0.3 - 0.9	1.5	1.5+
Effect On Wetlands		Proximity to Provincially Significant Wetlands			120m Subject to EIS
		Proximity to Local Wetlands			EIS
Effect on Areas of Natural and Scientific Interest		Proximity to ANSIs			120m Subject to EIS
Effect on Endangered and Threatened Species		Flora			EIS
		Fauna			EIS
		Fisheries			EIS
Effect on Significant Wildlife Habitat		Proximity to Habitat			EIS
Effect on Significant Woodlands		Proximity to Woodlands			EIS

Environmental Screening Criteria to Evaluate Candidate Sites for Dewatering Trenches

Environmental Screening Criteria		NMA Regulations	MOE Guidelines	Proposed	
Factors	Site Specific				
Social And Cultural Considerations	Restriction of Lands	Ownership		Municipal	
		Accessibility		Legal Access	
	Land Use Compatibility	Proximity to Sensitive Land Uses		500m Subject to Study	300 - 500m
		- Residences, Businesses, Schools etc.			15 - 100m
		- Recreational Tourist Attractions			
		- Cemetery		100m	100m
	- MTO Highways Utility Corridors			45m	
	Proximity to Other Land Uses			Not on prime lands	
	- Agriculture			Subject to Reforestation	
	- Forestry			Site Rehabilitation	
	- Aggregate Extraction				
	Aesthetics	Visibility		Vegetation Screening	
	Heritage and Cultural Features	Proximity to Heritage Site		100m	
		Impact on Potential Archaeological Resources		Subject to Study	
Technical And Cost Considerations	Property Size	Active Area		2.5 ha	
		Attenuation Zone to Achieve RUPO		20 to 40 ha	
	Land Acquisition	Purchase or Lease			\$
		Site Preparation	Clearing		\$
			Fencing		
	Access Road				\$
	Operating Costs	Site Operations			\$
		Haul Route Maintenance			\$
		Water Quality Monitoring			\$
Annual Reporting				\$	
Contingency Costs	To Achieve RUPO			\$	