

Innovations in Minimizing Waste and Wastewater Effluent from Food and Beverage Processing Operations

Waste Management and Water Issue Management

Waste Management and Water Issue Management Bulletins

There are a number of continually developing issues that affect waste management and water conservation in the Food and Beverage Processing Industry. Recently the regulatory climate has been fast paced. The Alliance of Ontario Food Processors is committed to staying on top of these developments to advocate, on behalf of its members, to the government, providing comment and direction to government initiatives. As well, AOFPP has developed background Issues Analysis Bulletins to provide insight to the Food and Beverage Processing Industry to help individual companies understand exactly how the regulations and new initiatives impact them.

Alliance of Ontario Food Processors – Issues Management

As an interactive method to track and report on developing environmental and regulatory issues in waste management and water conservation, Issues Management Bulletins are presented. These bulletins are periodically updated and distributed to Ontario Food and Beverage Processors to alert management to changing regulatory requirements. The list of Issue Management Bulletins includes:

Waste Management and Water Issue Management Bulletins

ID #	Issue	Date	Last Revision
!MB-1	Land Application of Food Wastes	Aug 10/09	Dec 15/09

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Issue #	Issue Management Bulletin	Date	Revised
IMB-1	<i>Land Application of Food Wastes</i>	Aug 10, 2009	Dec 15 2009

Land Application of Food Wastes:

The Food and Beverage Industry generates a number of liquid and solid wastes in food processing. Wastes can be liquids, such as high strength sugar water, to semi solids and liquid slurries, such as product tank wash downs. In general, these wastes are not considered hazardous, although there are a number of regulations that apply to disposal. Land application of these wastes has traditionally been used as a less expensive waste disposal option for food and beverage companies.

Land application is the placement of wastes or wastewaters onto the land. Various methods can be used including;

- Spray irrigation, especially in the case of low solids wastewaters;
- Subsurface injection, by means of specialized equipment on a tanker truck that places material below the surface;
- Overland flow, by a piped distribution system;
- Surface placement by specialized tanker truck.

In most cases, land tiling of the waste is practiced to work the material in to the soil, if desired or required by the regulation.

The Issue:

There are a number of regulations that govern the application of food waste to land, namely;

- Ontario Water Resources Act;
- Nutrient Management Act
- Clean Water Act

These Acts, including the interrelationship between the Acts, put significant restrictions on the application of food and other wastes on land as a disposal option.

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For generators who land apply wastes on their own or neighboring property, provisions of the **Ontario Water Resources Act** require the company to apply for a Certificate of Approval for a Sewage Works. In this case the company is in control of the waste management operations and must continue to document compliance to the Certificate of Approval Permit.

The **Nutrient Management Act** is relatively new and governs the application of nutrients to agricultural soil. Although primarily focused on the spreading of biosolids from wastewater treatment operations, food industry waste can be considered for spreading, defined as '**non-agricultural source material (NASM)**'. The regulations currently put significant onus for owners of land application sites to have a Certificate of Approval for application and to document volumes, nutrient levels, and have a plan in place before accepting these wastes.

Receivers of this waste material were required to be in compliance with this regulation in 2005. Food and beverage companies may be using these land application services but are not required to be in compliance until December 31, 2009. Compliance includes the preparation of a Nutrient Management Strategy by the generator that describes and documents how wastes are to be handled and associated volumes. **However, these provisions are presently in discussion. In June 2009 a posting on the MOE Environmental Registry outlines changes to the Nutrient Management Act that would eliminate the necessity for the preparation of a Nutrient Management Strategy.**

The **Clean Water Act** contains provisions for the development of drinking water source protection plans to protect sources of drinking water including wells and surface watercourses. Source protection areas are to be defined and risk management plans are to be developed to prevent or eliminate threats to drinking water sources. **Provisions of this Act and regulations will take precedence over other acts and regulations, with the Nutrient Management Act being specifically identified.**

Designation of a land application site within a protected area could result in the elimination or scale back of existing or future operations. Significant protection distances are outlined in the Act, putting continued land application of wastes at risk in certain locations.

Risks to the Food Processing Industry:

The changing regulations, including the restrictions the Clean Water Act and source protection place, will have an important impact on the Food Industry now and in the future. Some of the risks that will be faced include;

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- Fewer land application sites will be available for Non-Agricultural Source Material (NASM) as sites are enforced and regulated or decide to not receive material and/or shut down. Receivers may find it too expensive and administrative to proceed.
- As fewer options become available, the cost of the service will increase.
- In a response to manage the liquid/slurry wastes better and access more disposal options, more treatment or waste management equipment may be required.
- As a generator, food companies will be responsible for managing compliance at their facility as well as ensuring they are using haulers and disposal sites that are in compliance.

Mitigation Strategies:

In response to the risks, the Food and Beverage Industry can take steps to manage the issue and develop mitigating strategies.

- Based on the requirements of the Nutrient Management Act and the resulting compliance responsibilities, maintain a watch on this regulatory development and plan for compliance by December 31, 2010 if no extension or amendment is in place.
- Maintain a long term watch on the Act and the regulations as a number of changes are planned over a phase in period of several years. The changes are not all presented at this time but a direction for these changes has been published.
- If the site has a Certificate of Approval for spreading the waste on its own land, identify the nearest source protection area to determine if the site is within the protected area and there may be a risk to the Permit.
- Develop alternative commercial receptors for the waste material to be disposed of to mitigate the risk of a specific receiver not able to take any more waste.
- Identify hauler and waste receiver and ensure they are in compliance with the regulations. As a due diligence practice, know how the wastes are handled and that the companies are continuing with their documentation and reporting requirements. A Waste Audit can be helpful.
- Develop changes to the waste character to allow disposal by other facilities. For example, technology to thicken the waste or create a solid, will provide the opportunity to explore other disposal options.

Opportunities:

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While there are challenges facing the food processing industry with respect to land application of wastes, there are opportunities for the industry to be perceived as environmental leaders:

- **P2: application of P2 principles** can result in waste minimization and/or consistent waste quality that meets or exceeds requirements for land application;
- **Due Diligence:** an intimate knowledge of waste generation, transport and final disposal can indicate that the company can manage its wastes in a responsible manner; and,
- **Public Perception:** waste segregation, knowledge and quality control can assist in the decoupling of food processing wastes as “green, clean and organic” from the perceived notions of land applied wastes as “unknown and dangerous”.

Addendum

The following sections provide a brief description of selected Acts and Regulations regarding land application of food processing wastes. Further information can be obtained by consulting the applicable Acts and Regulations from the elaws site, www.e-laws.gov.on.ca, or by contacting the AAFP.

Regulations

Ontario Water Resources Act

Regulations respecting land application vary depending on the designation of the waste. If the waste is not considered for nutrient amendment, then the waste is considered (usually) a liquid industrial waste or sewage. A Sewage Works Approval under the Ontario Water Resources Act is required for land application, whether the application location is on site or off site. If an off site location is used, the waste hauler has to have the appropriate Waste Management System Certificate of Approval under the Environmental Protection Act.

Nutrient Management Act

In the case where the waste is considered for soil nutrient amendment, then provisions of the Nutrient Management Act and Regulations (O.Reg. 267/03) are applicable. Under the provisions of the Act, any material that is not from an agricultural source that is capable of being applied to land as a nutrient is deemed a “non-agricultural source material” (NASM). Generators of NASM (for our case, food

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processors) are required, by December 31, 2010, to prepare a Nutrient Management Strategy. According to OMAFRA, the Nutrient Management Strategy (NMS) is a document that outlines how NASM is to be managed over a specified time, typically five years. Note that operators of land application locations are required to prepare a different document, the Nutrient Management Plan, that outlines short term location specific operating procedures.

The NMS will include the following components:

- Facility Description;
- Material Description and Storage Information;
- Projected Five Year Strategy (annual quantities, general destination of material);
- Nutrient Analyses (if available) (parameters, monitoring, record keeping, information transfer);
- Contingency Plans (management if disposal becomes unavailable);
- Destination of Material (identification of each projected site, quantity to be supplied, application rate, total area and MOE site approval information (disposal site must have Organic Soil Conditioning Certificate of Approval));

In addition to the initial preparation and submission of the NMS, an annual report and a five year summary report are required.

Only specified individuals may prepare the NMS. These individuals must hold the Non-Agricultural Operation Strategy Development Certificate from the OMAFRA, received after a training program and a certification examination.

Where an off site facility is used, the transporter/hauler or storage site operator for the waste must not only have an Organic Waste Management Systems Certificate of Approval (COA) (and may also have a general Waste Management Systems COA), but is also required to have a Broker Certificate issued by OMAFRA. The certificate is issued after successful completion of an OMAFRA training course and certification examination.

Proposed Changes regarding Non-Agricultural Source Materials (NASM)

In late June, 2009, MOE and OMAFRA proposed regulatory changes regarding the management of NASM and posted these on the Environmental Registry for a 30 day comment period.

As stated in the registry, “currently, NASM is considered a waste under Part V of the Environmental Protection Act”. The proposed regulatory changes involve the redesignation of this material as a nutrient

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if the material meets analytical quality standards and if the material is applied to agricultural land. Application to parks and mine tailings reclamation areas is not included.

For generators of NASM, the proposed changes would result in the elimination of the requirement to prepare a Nutrient Management Strategy (NMS). However, generators would be required to conduct the sampling and analysis of their material to determine the quality of the NASM (formerly, the onus was on the receiver to sample and analyze material).

Haulers would not have to obtain a Broker's Certificate under the proposed changes.

For receivers (farmers), a Certificate of Approval for an Organic Soil Conditioning site would not be required under the proposed changes. The proposed changes would allow any farmer to develop an NASM plan (by a certified person) for use of NASM. The plan would be approved by OMAFRA and the farmer would only have to notify the MOE prior to the land application.

These changes are designed to relieve the regulatory burden on generators, haulers and farmers regarding approved NASM, but still provide strict standards for the application of NASM on agricultural land.

Clean Water Act

The Clean Water Act allows for the formation of drinking water source protection areas, based on the area over which a conservation authority has jurisdiction. A source protection committee is to be established that will develop an assessment report and a source protection plan. The source protection plan will include policies to ensure that an activity will never pose a threat or ceases to pose a threat to drinking water. In O.Reg.287/07 of the Clean Water Act, prescribed drinking water threats are listed and includes "the application of non-agricultural source material to land".

The Act and Regulations contain a provision for risk assessments to be performed on perceived threats to drinking water sources. Results of the risk assessment may be used to develop a management plan that could have impacts on land application operations, limiting the application to seasonal operation or limiting areas allowed for land application, this despite provisions of the Nutrient Management Act or the Ontario Water Resources Act regarding Certificates of Approval.

Results of the risk assessment may also be used to develop capture zones and time of travel zones around drinking water sources, especially wells. Capture zones are typically within a 100 metre radius of a well, while time of travel limits include two year, five year and 25 year time frames. Limitations on land use based on a 25 year time of travel could have significant consequences regarding land application as the distance of an application location from a well or source could be quite remote.

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Summary

Regulatory constraints on land application are well defined in the province. Whether as a waste treatment system regulated by Sewage Works Approval or as nutrient amendment regulated by the Nutrient Management Act, operators are familiar with the requirements for siting, operation and monitoring. Proposed changes to the Nutrient Management Act may allow for less onerous requirements for both generator and receiver and may open up more locations for land application of food processing wastes.

The opposite side of the coin is that provisions of the Clean Water Act regarding drinking water source protection areas and constraints on use may result in limitations on available land suitable for application of food processing wastes.