



# **Sustainable Winemaking Ontario:** An Environmental Charter for the Wine Industry

## **Sustainable Winemaking Ontario - Eco-Winegrowing 101**

**2007**

**Narelle Martin  
Two Hemispheres Environmental Consulting Inc.  
For the Wine Council of Ontario**

# ACTION CHECKLIST

## for winemakers and grape growers

Use this checklist to identify which requirements will apply to your operation.

√	IF YOU:	THEN YOU ARE REQUIRED TO:	SEE PAGE NO:
	take more than 50,000 litres of water per day from wells or surface water	obtain from the Ministry of the Environment a Permit to Take Water	Wineries, 4 Growers, 5
	supply drinking water from trucked water supply from a region or local municipality	Understand how changes to Regulations affect you, e.g. testing of water	6-12
	supply drinking water to the public from your own water supply (e.g., well or surface)	Understand how changes to Regulations affect you, e.g. testing of water	6-12
	have wastewater from your winery going to a municipal treatment plant	obtain approvals from the municipality and access to their infrastructure	13
	treat wastewater on-site with a design capacity over 10,000 litres per day	obtain approvals from the Ministry of the Environment	13 - 18
	treat wastewater on-site with a design capacity up to 10,000 litres per day	obtain approvals from the municipality	13 - 16
	have a man-made drainage system in your property	manage it appropriately	20 - 23
	have a watercourse on your property	obtain permits before constructing crossings, altering land, changing watercourse locations	24 - 25
	produce pomace from crush for disposal and dispose of it on land	comply with the Protocol for Utilization of Waste Fruits on Agricultural Lands	27 - 28
	have a laboratory using	check that you're complying with	28 - 34

√	IF YOU:	THEN YOU ARE REQUIRED TO:	SEE PAGE NO:
	chemicals	check that you're complying with hazardous waste requirements	28
	have propane tanks on-site	check that you're complying with hazardous waste requirements	28
	receive marc for application to your land	comply with nutrient management guidelines and rules	35
	apply pesticide	comply with regulations	36 - 44
	store pesticide on-site	comply with pesticide storage and handling regulations	41
	have a boiler on-site	comply with air emissions regulations	46
	have a generator on-site	comply with air emissions regulations	46
	have machinery operating that can generate noise that is heard off-site	consider ways to reduce the impact of noise	49
	have vehicles moving regularly on and off your property	consider ways to reduce the impact of vehicles for noise and emissions	49
	have a wind machine on-site	comply with guidelines for wind machines	50
	have bird-scaring devices	consider ways to reduce the impact on neighbours	51
	have your property located in the Niagara Escarpment Planning Area	obtain additional approvals from the Niagara Escarpment Commission for a range of activities	52
	wish to buy or expand on land in the Niagara Escarpment	check with the Niagara Escarpment Commission	52

√	IF YOU:	THEN YOU ARE REQUIRED TO:	SEE PAGE NO:
	have any of the above	ensure there are no deadlines that might affect you	56
	intend to build new structures on your property	obtain permits from all authorities before you start	52 and the related document "A Newcomer's Primer: The Environment and the Wine Industry in Ontario".

**DISCLAIMER:** While every attempt has been made to make the information as accurate as possible, this material is provided as a guide only. The Wine Council of Ontario and the author assume no responsibility for decisions based on the contents of this document. Legal requirements can and do change rapidly and readers are encouraged to seek additional information.

# CONTENTS

<b>ACTION CHECKLIST.....</b>	<b>II</b>
<b>FOREWORD.....</b>	<b>VIII</b>
<b>ACKNOWLEDGEMENTS.....</b>	<b>IX</b>
<b>BACKGROUND .....</b>	<b>1</b>
RELATED DOCUMENTS.....	1
<b>WATER.....</b>	<b>3</b>
WINERIES .....	3
Municipal Water .....	3
Non-Municipal Sources .....	3
Permits for Taking Water.....	4
Additional Permits .....	4
GROWERS .....	5
Permits for Taking Water .....	5
Within the Municipality of Niagara-on-the-Lake.....	5
Niagara Escarpment Development Control Area.....	5
Frequently Asked Questions.....	6
DRINKING WATER REQUIREMENTS .....	6
Winery with a School Attached .....	7
Facility Providing Living Quarters for Workers.....	7
Who Is Affected.....	8
A Facility Connected to a Municipal System.....	8
A Facility that Trucks In Municipal Water .....	8
A Facility that Draws Water from its own Surface or Ground Water Supply.....	9
Guide Series.....	9
Seasonal Accommodation .....	9
Posting of Signs.....	12
<b>WASTEWATER FROM WINERIES.....</b>	<b>13</b>
TREATMENT OPTIONS .....	13
Wastewater to Municipal Treatment Plants .....	13
Wastewater Treated On-Site .....	13
APPLICATIONS FOR APPROVALS .....	15
From MOE – Sewage Treatment Plants .....	15
From Municipalities .....	16
Frequently Asked Questions.....	17
Beyond the Rules .....	18
<b>VINEYARD DRAINAGE.....</b>	<b>20</b>
MUNICIPAL DRAINS .....	20
NON-MUNICIPAL DRAINS .....	21
Installation of Drains.....	21
Maintenance of a Drainage System.....	21
Drainage and Niagara Escarpment Development Control Area.....	22

<b>WATERSHEDS, WATERCOURSES AND WATER QUALITY .....</b>	<b>23</b>
WATERSHEDS.....	23
WATERCOURSES .....	24
WATER QUALITY .....	26
<b>WASTE .....</b>	<b>27</b>
WINERIES .....	27
<i>Fruit Waste – Pomace.....</i>	<i>27</i>
Frequently Asked Question .....	28
<i>Beyond the Rules .....</i>	<i>28</i>
HAZARDOUS OR LIQUID INDUSTRIAL WASTE .....	28
Wineries.....	28
Key Considerations.....	31
Frequently Asked Questions.....	32
<i>Beyond the Rules .....</i>	<i>33</i>
GROWERS .....	34
<b>NUTRIENT MANAGEMENT.....</b>	<b>35</b>
<b>PESTS AND PESTICIDE MANAGEMENT.....</b>	<b>36</b>
PESTICIDE REGULATIONS .....	36
<i>Federal .....</i>	<i>37</i>
<i>Provincial.....</i>	<i>37</i>
<i>Municipal Rules and Wineries .....</i>	<i>38</i>
MANAGEMENT .....	39
Storage Issues .....	41
Pesticide Container Rinsing.....	41
Pesticide Application .....	41
Contamination of Farm Water.....	43
<i>Beyond the Rules .....</i>	<i>44</i>
<b>AIR EMISSIONS .....</b>	<b>46</b>
<i>Beyond the Rules .....</i>	<i>47</i>
<b>NOISE.....</b>	<b>49</b>
WINERIES .....	49
Machinery Noise.....	49
Vehicle Movement .....	49
GROWERS .....	50
Legal Aspects of Noise Control.....	50
Wind Machines.....	50
Bird-Scaring Devices.....	51
<b>GROWING YOUR BUSINESS .....</b>	<b>52</b>
NIAGARA ESCARPMENT – ADDITIONAL APPROVALS .....	52
HIGHLIGHTS OF WINERY DEVELOPMENT POLICIES UNDER THE 2005 NIAGARA ESCARPMENT PLAN.....	53
Winery Restaurants.....	53
Winery Size and Development .....	54

<b>CONCLUSION .....</b>	<b>55</b>
APPENDIX ONE: IMPORTANT DATES .....	56
APPENDIX TWO: REFERENCES .....	57
APPENDIX THREE: OTHER SOURCES OF INFORMATION .....	60

## FOREWORD

The first version of this document was produced in May 2005. It was posted on the Wine Council of Ontario's website and circulated to stakeholders and other interested parties. Since then, a series of changes has been made to the requirements expected of the wine industry. This final edition reflects these changes, particularly in drinking water requirements and updates related to the Niagara Escarpment Commission. Feedback from consultation also highlighted the need for additional explanations in some areas, such as hazardous waste.

Readers are advised that this document is an introduction only. Changes in requirements occur rapidly, and you are strongly encouraged to seek additional information to ensure that your business decisions continue to reflect current requirements.

As always, suggestions and comments are welcome and should be addressed to:

The Technical Committee  
Sustainable Winemaking Ontario  
Wine Council of Ontario  
110 Hannover Drive, Suite B205  
St Catharines, ON L2W 1A4

Or sent by email to [info@winesofontario.org](mailto:info@winesofontario.org)

Please note that a printed version of this document can be ordered through the Wine Council of Ontario's website. A CD-ROM, entitled *Sustainable Winemaking Ontario: An Environmental Charter for the Wine Industry*, is also available.



# ACKNOWLEDGEMENTS

This document has been produced by the Wine Council of Ontario. The contributions of staff from the Ontario Ministry of the Environment, the Ontario Ministry of Agriculture, Food and Rural Affairs, the Liquor Control Board of Ontario, the Niagara Escarpment Commission and the Niagara Peninsular Conservation Authority proved very helpful, as did input from Stephen Bedford and Henri Bannemeer of the Municipality of Niagara-on-the-Lake, Kevin Ker of Brock University and Dr. Wendy McFadden-Smith. Individuals within the wine industry also provided examples and suggestions.

Particular thanks are due to members of the Technical Committee of the Wine Council of Ontario. Past and current members shaped, reviewed and helped write this document.

## **Members of the Technical Committee**

- PETER ATEBA, ANDRES WINES LTD.\*
- GREG BERTI, PELLER ESTATES
- ROBERTO DiDOMENICO, REIF WINERY
- LINDA FRANKLIN, PRESIDENT OF WINE COUNCIL OF ONTARIO
- BRUNO FRIESEN, PELEE ISLAND WINERY
- RON GIESBRECHT, HENRY OF PELHAM FAMILY ESTATE WINERY
- TOM GREEN, LAKEVIEW CELLARS ESTATE WINERY(CHAIR)
- SEAN HAILS, ANDRES WINES LTD.\*
- JORDAN HARRIS, NIAGARA COLLEGE TEACHING WINERY
- GERALD KLOSE, VINCOR INTERNATIONAL INC.
- KEVIN LATTER, CAVE SPRING CELLARS LTD.
- JAMES MANNERS, INNISKILLIN WINERY\*
- MARK NEUFELD, GRAPE GROWERS OF ONTARIO
- JON OGRYZLO, NIAGARA COLLEGE
- PETER PFEIFER, ONTARIOGRAPES CONSULTING
- NATALIE REYNOLDS, HILLEBRAND ESTATES WINERY
- BRIAN SCHMIDT, VINELAND ESTATES WINERY
- TOM SEAVER, JACKSON-TRIGGS VINTNERS\*
- DAVID SHEPPARD, COYOTE'S RUN ESTATE WINERY
- MATTHEW SPECK, HENRY OF PELHAM FAMILY ESTATE WINERY
- ANDREW VON TIECHMAN, PELEE ISLAND WINERY\*
- GERRY WALKER, AGRICORP
- DAVE WILEY, GRAPE GROWERS OF ONTARIO

\* past members of the Technical Committee.

Narelle Martin, consultant and writer, provided assistance to the Technical Committee.

This document also benefited from the review and input of the following people at a workshop held on Tuesday, January 18, 2005. Their suggestions have been very helpful.

- THOMAS BACHELDER, VINCOR INTERNATIONAL INC.
- DARRYL FIELDS, ANGELS GATE WINERY LTD
- TOM GREEN, LAKEVIEW CELLARS ESTATE WINERY
- SEAN HAILS, ANDRES WINES LTD.
- JORDAN HARRIS, NIAGARA COLLEGE TEACHING WINERY
- DAVE HOOPER, CAVE SPRING CELLARS LTD.
- KEVIN LATTER, CAVE SPRING CELLARS LTD.
- SCOTT MCGREGOR, EASTDELL ESTATES
- BETH MISCHUK, KACABA VINEYARDS
- JON OGRYZLO, NIAGARA COLLEGE TEACHING WINERY
- JOHN PAROSCHY, CHATEAU DES CHARMES WINES LTD.
- ANGELO PAVAN, CAVE SPRING CELLARS LTD.
- ISABELLE ROY-MEUNIER, VINCOR INTERNATIONAL INC.
- BRIAN SCHMIDT, VINELAND ESTATES WINERY
- THOMAS SCHULZ, NIAGARA COLLEGE TEACHING WINERY
- TOM SEAVER, VINCOR INTERNATIONAL INC.
- DAVE SHEPPARD, COYOTE'S RUN ESTATE WINERY
- SEAN SOUTER, LEGENDS ESTATES WINERY
- MATTHEW SPECK, HENRY OF PELHAM FAMILY ESTATE WINERY

# BACKGROUND

At a March 2004 workshop, industry members voiced the need for information on current environmental requirements and guidelines of organizations such as the Ministry of the Environment, the Ministry of Agriculture, Food and Rural Affairs, the Niagara Escarpment Commission and local governments.

This document is part of a continuing proactive program of the Wine Council of Ontario. The program – Sustainable Winemaking Ontario: An Environmental Charter for the Wine Industry – has wide-ranging goals:

- to improve the environmental performance of Ontario's wine industry
- to continually improve the quality of wine growing and wine making in an environmentally responsive manner
- to provide a way to address consumer and resident questions in relation to the environment and the wine industry
- to add value to Ontario's wine industry.

Knowing what is legally required is only one part of the approach to continuous improvement. While it is essential from a due diligence perspective that requirements are met, good environmental practice means more. Other elements of the program include being able to monitor and track environmental performance, establishing systems that prevent pollution and constantly identifying better ways of doing business. All of these other elements of Sustainable Winemaking Ontario have been developed.

## Related Documents

This document is one of a series that has been developed since October 2004. Other documents include:

- *Sustainable Winemaking Ontario – Environmental Best Practice for Wineries*
- *Sustainable Winemaking Ontario – Sustainable Viticulture Addendum to the Canada – Ontario Environmental Farm Plan*
- *Sustainable Winemaking Ontario – Environmental Best Practice for Winery Hospitality Services*
- *Sustainable Winemaking Ontario – A Newcomer's Primer: the Environment and the Wine Industry in Ontario*
- *Tracking Sheets for Wineries* – tracking sheets for consumption and costs of inputs, such as electricity, water and cleaning agents for wineries, were established and trialed by a number of wineries during Vintage of 2004.

Of these documents, *Sustainable Winemaking Ontario - Environmental Best Practice for Wineries* and *Sustainable Winemaking Ontario - Environmental Best Practice for Winery Hospitality Services* have also been developed as an interactive spreadsheet, allowing businesses to instantly receive feedback on their scoring and progress over time.

Energy efficiency in wineries is of particular interest to the industry. Accordingly, external funding was obtained for research and workshops. In addition, two publicly available documents have been produced for the Wine Council of Ontario:

- *Developing Energy Benchmarks for the Ontario Wine Industry* – by Altech Environmental Consulting and Ontario Centre for Environmental Technology Advancement.
- *Sustainable Winemaking Ontario - Energy Best Practice for Wineries* – by Narelle Martin.

Finally, Niagara College is developing training programs for people currently working in the industry, as well as including more emphasis on environmental requirements and expectations for curriculum for new industry participants.

# WATER

The management of water is changing in Ontario. The water-borne contamination of Walkerton's water supply, which killed seven people and made thousands ill, has been a catalyst for change. New approaches and legislation have been introduced, for example in source water protection, drinking water and nutrient management and more is promised.

Wineries and grape growers need to stay abreast of the changing requirements and trends. At the very least, it is clear that regulatory approaches are being tightened to reduce risk to the environment and human health, and that trend is likely to continue. In the longer term, it is also likely that there will be increases in the price for access to water and more stringent requirements for management of wastewater.

## Wineries

Wineries can access water from a range of sources – municipal water through a pipe system, water trucked into a winery and hospitality area, or water from surface water or drilled or dug wells.

## Municipal Water

If your operation has access to piped water from a municipal system, the requirements are simplified. Remember:

- ✓ all permits must be in place at the start of the process of any development or expansion
- ✓ there will be charges for water and wastewater
- ✓ there may be an assumption that the amount of water taken into a plant or premises is the same as what goes out as wastewater. To ensure costs are directly related to usage, consider exploring the benefits of installing a measurement system for wastewater leaving the property.

## Non-Municipal Sources

Wineries that are not on municipal systems have a range of options. The essential regulation that must be complied with is:

- ✓ you must obtain a Permit to Take Water if taking more than 50,000 litres or 11,000 imperial gallons a day.

## Permits for Taking Water

Both wineries and growers must have a **Permit to Take Water** if using more than 50,000 litres or 11,000 imperial gallons per day. This includes water taken from “wells, inlets from surface source of supply, structure or works for divergence of water and any combination of the above”.<sup>1</sup>

Applications for permits are made to the Ministry of the Environment (MOE). The application to take water is available on the Ministry website.

- ✓ Complete an application form, called an Application for Permit to Take Water, available at <http://www.ene.gov.on.ca/envision/gp/5046e02.pdf>.

There is also a guide to filling out the application, at <http://www.ene.gov.on.ca/envision/gp/5046e.pdf>. The guide encourages you to get as much information as possible before the application is submitted. You are also urged to speak to the MOE early in the process. The MOE’s number in Hamilton is 1 800 668-4557.<sup>2</sup>

Permits for taking water are issued for up to a maximum of 10 years. The length of the permit given will trigger how often you need to reapply for the permit. You should note that although you may have a permit, the Conservation Authority can also impose a limitation based on the amount of flow in the river or stream.<sup>3</sup>

The permit process has been strengthened to:

- ensure tough reviews for applications for takings
- ensure water conservation measures are implemented
- refuse certain water-takings in high-use watersheds
- increase local knowledge of proposed takings
- require annual monitoring and reporting of takings.<sup>4</sup>

### *Additional Permits*

Within the Niagara Escarpment Development Control Area, if you are taking water for commercial purposes or an amount more than 50,000 litres or 11,000 imperial gallons of water per day:

- ✓ you require a Development Permit from the Niagara Escarpment Commission.

For further information see <http://www.escarpment.org/permits/dpa.htm>.

Note that if you are proposing to take water by damming or diversion works:

- ✓ you require approval (under the Lakes and Rivers Improvement Act) from the Ministry of Natural Resources.

Contact the Ministry of Natural Resources for relevant information.<sup>5</sup>

Similarly, if you are looking at taking water from surface water bodies, you may need approval from the Department of Fisheries and Oceans Canada, the local Conservation Authority and/or the Ministry of Natural Resources regarding fish spawning and habitat concerns.<sup>6</sup> Water levels also will need to be addressed.

The Ministry of the Environment encourages all of these approvals required from other agencies to be sought before you put the application in to the Ministry of the Environment for approval.

## **Growers**

### **Permits for Taking Water**

#### ***Within the Municipality of Niagara-on-the-Lake***

In addition to the requirements outlined above, there are a number of variations for grape growers. The Municipality of Niagara-on-the-Lake is the only place in Ontario where:

- ✓ you must also apply to the Municipality for permission to take water from the water services supplied by NOTL.

Niagara-on-the-Lake provides the only municipally administered irrigation system in Ontario.<sup>7</sup> As a result:

- ✓ you will also pay for the access to water and associated costs.

For further information for growers in Niagara-on-the-Lake, call 905 468-3278.

#### ***Niagara Escarpment Development Control Area***

Within the Niagara Escarpment Development Control Area, the digging or drilling of a well for the purposes of general agricultural development is specifically exempted from requiring a

Development Permit, if listed as a permitted use under the land use policies in the Niagara Escarpment Plan. Contact your local planner and the Niagara Escarpment Commission if you are unsure. The pamphlet *Do I need a Niagara Escarpment Permit* at <http://www.escarpment.org/Publications/permitbooklet.htm> is also helpful.

## Frequently Asked Questions

### *Do I have to renew my application every year?*

This will depend on the length of the permit granted by the MOE. The MOE requires renewal of the permit prior to the expiry date. If you are a grower in Niagara-on-the-Lake, in addition to any permit renewals for the province, you must renew your application in March of each year.

### *Are there costs associated with obtaining a Permit to Take Water?*

The cost associated with processing a MOE Permit to Take Water ranges from approximately \$750 to \$3,000. Permits for agricultural purposes (such as tender fruits) have been exempted from the administrative fee. Additional fees apply for takings supplied by the Town of Niagara-on-the-Lake.

### *How much does it cost to use the water?*

Except for certain takings from the Town of Niagara-on-the-Lake, the water is free.

### *How does the MOE check how much water is taken?*

It is your responsibility to keep records of how much water is taken. This is a condition of the permit issued. These records must be made available to the MOE by December 31 of each year and provided to your Regional Office.

### *What happens if I take more than permitted?*

If the MOE finds out, you may be subject to enforcement. To reduce this risk, you should apply for an amendment to your permit.

## Drinking Water Requirements

Regulations for premises that provide drinking water have changed significantly, and continue to change. The purpose of all of these regulations and changes is to protect human health and reduce the risk of water-borne disease outbreaks.

Most provisions relate to facilities that provide water from either their own well or surface water supply. However, if you truck in water from a municipal source, you may also be affected.

If you are a facility serving drinking water to the public, then you may be affected by **Ontario Regulation (O. Reg.) 252/05**<sup>8</sup> or its predecessor, O. Reg. 170/03. "The Drinking Water Systems



Regulation (O. Reg. 170/03), made under the Safe Drinking Act, came into effect June 1, 2003 and was most recently amended on June 5, 2006.”<sup>9</sup>

These amendments followed public consultations and were to “make the regulation more workable and affordable for owners and operators of municipal and non-municipal year round residential drinking water systems and systems serving designated facilities.”<sup>10</sup>

Part of the review meant that O. Reg. 170/03 now generally only applies to:

- large municipal residential water systems
- small municipal residential drinking water systems
- municipal non-residential systems serving designated facilities
- a designated facility that provides water to a susceptible population, such as children, the elderly or those with medical conditions.

The wine industry will now largely be impacted by O. Reg. 252/05. Most wineries affected by the regulations are likely to be classified as small non-municipal non-residential drinking water. *It is critical that you review the information sheets yourself or with your consultant to ensure that you classify your system correctly.*

Unlike its predecessor (O. Reg. 170/03), O. Reg. 252/05 does not establish deadlines for installation of treatment. Previously there had been requirements to install treatment equipment by December 31, 2006. Also, in the amendment, the amount of testing required has been reduced.

There are some special circumstances that wine industry members need to consider as they are working their way through the drinking water regulations.

### ***Winery with a School Attached***

If a winery has a school attached (such as a school of cooking) or if wineries are run in conjunction with colleges, then the winery should consult the Education Act to determine if they meet the definition of a school or a private school. If a winery is defined as a school or private school, it would be a **designated facility**, which would trigger more rigorous requirements. Drinking water systems that provide water to designated facilities are regulated under O. Reg. 170/03.<sup>11</sup>

### ***Facility Providing Living Quarters for Workers***

Living quarters for workers, as are provided by many growers, are likely to be caught under the changes in regulations. There will be a question of whether the accommodation is considered a private residence.

## Who Is Affected

Depending on where the water comes from, the following businesses may be affected:

- wineries
- growers, especially those that provide accommodation to seasonal workers
- facilities that offer tasting of wines with accompanying cheeses and the like
- restaurant facilities associated with a winery
- bed and breakfast facilities.

The source of the water is important. If it comes from a municipal system (see below) then you are not affected by the regulations. Those who truck in water, or who obtain water from wells or surface water, may be impacted.

The responsibilities for ensuring safe drinking water under O. Reg. 252/05 are outlined in *Supplying Safe Drinking Water* of June 2005, which is available at <http://www.ene.gov.on.ca/envision/gp/5117e/pdf>. The Guides that the Ministry of Environment has produced are important to determine which type of regulations will apply. These are outlined in more detail below.

The Ministry of the Environment advises that businesses (winery, grower or accommodation) must determine for themselves which classification their facility falls under. Consult the MOE website, MOE advisers, or consultants.

### A Facility Connected to a Municipal System

*If your small non-municipal facility serving the public is connected to and your water comes directly from a municipal or other drinking water system that is regulated under O. Reg. 170/03 and meets the testing and treatment requirements of this regulation, and all the piping in your facility is plumbing under the building code, then the Drinking-Water Systems Regulation **does not apply to your facility, and nothing is required of you.***<sup>12</sup>

### A Facility that Trucks In Municipal Water

A facility that trucks in municipal water must undertake the required sampling of the system.<sup>13</sup> This would apply to a number of wineries in Ontario that have water trucked into the premises from the municipal water plant.

## A Facility that Draws Water from its own Surface or Ground Water Supply

A number of wineries in Ontario obtain water from lakes, rivers, or wells. These facilities also have responsibilities under the Regulations.

In all cases where the Regulations apply, it is recommended that you check the Guide series produced by the Ministry of Environment. It should also be noted that these Regulations are again under review, and that businesses need to continually keep aware of their obligations.

### Guide Series

A series of guides has been developed to assist owners and operators of drinking water systems. These can be downloaded from the website at <http://www.ene.gov.on.ca/envision/water/sdwa/reg252summary.htm> and are linked into the following table and are, again, critical in trying to identify which rules will apply to your operation.

For example, *A Guide for Owners and Operators of Small Non-Municipal Non-Residential Drinking Water* applies to a facility “if you are an owner or operator of a small drinking water system and your system:

- obtains its water from a well or surface water source (such as a lake or river)
- serves a public facility (public facilities include places such as small hotels, bed and breakfasts, marinas, recreational facilities, fishing camps, small resorts, and facilities like road-side garages or rural stores that have washrooms for the public)
- does **not** serve
  - a designated facility
  - a major residential development (six or more homes)
  - a trailer park or campground that has six or more sites with water hook-up.
- is **not** owned by a municipality
- is **not** capable of supplying drinking water at a rate of more than 2.9 litres per second (equivalent to 250,000 litres per day).”<sup>14</sup>

### *Seasonal Accommodation*

If you provide seasonal accommodation, the category of *non-municipal, seasonal residential drinking water system* may apply to you. These are systems that supply water seasonally and serve:

- campgrounds and trailer parks with six or more sites with water service hook-ups
- communal cottage developments with six or more private residences.

As with the previous guide, there are a number of requirements. You must:

- ✓ select a licensed laboratory
- ✓ take drinking water samples for testing
- ✓ notify authorities of adverse test results
- ✓ take corrective action if you have an adverse test result
- ✓ post warning notices of potential problems and
- ✓ retain records and information.<sup>15</sup>

A copy of the guide is available on the web at <http://www.ene.gov.on.ca/envision/gp/5119e.pdf>.

Finally, another category of drinking water systems that may apply to parts of the business for wineries and growers is *non-municipal year-round residential drinking water systems*. These water systems include privately owned systems that serve:

- apartment buildings with six or more residential units
- private subdivisions with six or more houses
- condominium or townhouse complexes with six or more residential units
- mobile home parks with six or more homes
- trailer parks supplying water year-round to six or more sites with water service hook-up.<sup>16</sup>

A fact sheet is available at <http://www.ene.gov.on.ca/envision/gp/5477e.pdf>.

The following table provided by the Ministry of the Environment summarizes the requirements for O. Reg. 252 and is available at

<http://www.ene.gov.on.ca/envision/water/sdwa/reg252summary.htm>. This table is also available as a PDF document under the heading *Do you serve drinking water to the public?* available at <http://www.ene.gov.on.ca/envision/gp/5221e.pdf>.

*Summary*

<b>REQUIREMENT</b>	<b>Small Non-Municipal Non-Residential</b>  (e.g., church, motel, B&B, gas station, restaurant)	<b>Large Non-Municipal Non-Residential</b>  (e.g., large resort, industrial facility)	<b>Small Municipal Non-Residential</b>  (e.g., community hall, library, ballpark, arena)	<b>Large Municipal Non-Residential</b>  (e.g., airport, large sports complex)	<b>Non-Municipal Seasonal Residential</b>  (e.g., trailer park / campground, communal cottage system)
<b>Sampling in the Distribution System or Plumbing</b>	Monthly sampling for <i>E. coli</i> and total coliforms.  Systems serving food service establishments may be directed by the Medical Officer of Health to sample at more frequent intervals.	Weekly sampling for <i>E. coli</i> and total coliforms.	Bi-weekly sampling for <i>E. coli</i> and total coliforms.	Weekly sampling for <i>E. coli</i> and total coliforms.	Bi-weekly sampling for <i>E. coli</i> and total coliforms.  Systems with more than 100 service connections must take an additional sample every month for every 100 service connections.
<b>Testing</b>	Drinking water samples must be sent to a laboratory licensed by the MOE for testing.				
<b>Sign Posting Option</b>	Posting allowed, except for food service establishments.	Posting not allowed (unless system is not using electricity).	Posting allowed, except for food service establishments.	Posting not allowed (unless system is not using electricity).	Posting not allowed (unless system is not using electricity).
	Where sign posting is available, the MOE must be notified if signs are posted instead of testing. Notification to the Director of Posting Warning Notices.				
<b>Installation of Treatment</b>	No treatment-related requirements.	No requirement to install treatment. Certified operator must operate system to provide proper disinfection if treatment has been installed in accordance with previous regulatory requirements.	No treatment-related requirements.	No requirement to install treatment. Certified operator must operate system to provide proper disinfection if treatment has been installed in accordance with previous regulatory requirements.	No treatment-related requirements.
<b>Corrective Action</b>	Notify the MOE Spills Action Centre at 1 800 268-6060 or 416 325-3000 and the local <b>Medical Officer of Health</b> of adverse test results. Take corrective action as required by the regulation.				
<b>Record-Keeping and Reporting</b>	Records and documents retained as required by regulation. Annual reports not required.				

## Posting of Signs

In some instances, you may be able to post a sign from the Ministry of the Environment saying that the water is untested and should not be drunk. Signs can be posted if your drinking water system:

- does not supply water to a food service establishment or
- does not use electricity or serve any building that does not use electricity.<sup>17</sup>

It is unlikely that wineries will wish to follow this route, or be eligible. You should contact your local public health unit to determine if this option may be available to you.

If you fit the criteria as a small non-municipal non-residential drinking water provider, and cannot post warning signs, then the legislation has a number of requirements. These are outlined in detail in the guide, but include:

- ✓ selecting a licensed laboratory
- ✓ having drinking water samples tested
- ✓ notifying authorities of adverse test results
- ✓ taking corrective action if you have an adverse test result
- ✓ posting warning notices of potential problems
- ✓ retaining records and information.<sup>18</sup>

Note that this is a summary only. Further information is available at the Ministry of the Environment's Public Information Centre at **1 800 565-4923**. All of the documents are also available on the Ministry's website at [www.ene.gov.on.ca](http://www.ene.gov.on.ca).

# WASTEWATER FROM WINERIES

Wineries use water throughout the production process. All wastewater must be managed to reduce environmental impact and comply with legislation. In managing wastewater there are a number of options.

Within the Niagara Escarpment Development Control Area, in addition to the requirements outlined below, a sewage treatment plant would also require a Development Permit from the Niagara Escarpment Commission.

## Treatment Options

### Wastewater to Municipal Treatment Plants

Wastewater may be collected and sent through pipes to municipal treatment plants. In these cases, as the winery is being designed and developed, approvals by the local municipality will be necessary. The municipality will be interested in both the volume of wastewater generated, and the quality of that wastewater. You can expect cost charges to relate to both, with penalties imposed if the wastewater standards are breached.

### Wastewater Treated On-Site

Other sites will not have access to piped municipal services. A common option is to collect the waste and dispose of it on-site, through a sewage works. The legislation that covers this area is the Ontario Water Resources Act (OWRA).

***Sewage** includes drainage, storm water, commercial wastes and industrial wastes and such other matter or substance as is specified by regulations under clause 44(1)(i).*

***Sewage works** means any works for the collection, transmission, treatment and disposal of sewage or any part of any such works, but does not include plumbing or other works to which the regulations made under clause 44(2)(a) apply.<sup>19</sup>*

The requirements for the establishment and operation of sewage works<sup>20</sup> are contained in Section 53 of the OWRA. The essentials are:

- ✓ You must obtain **approval** from the Ministry of the Environment for the **establishment** of new sewage works or any **modifications** to existing sewage works (Subsection 53(1)).
- ✓ You cannot **operate** an unapproved sewage works (Subsection 53(5)).

- ✓ There are some exemptions but these are limited (under Subsection 53(6)). These include:
  - if the sewage works is designed for the partial treatment of sewage that is to drain or be discharged to a sanitary sewer
  - to a sewage system that is subject to the Building Code Act, 1992
  - to a sewage works the main purpose of which is to drain agricultural lands
  - to a drainage works under the Drainage Act, the Cemeteries Act, the Public Transportation and Highway Improvement Act or the Railways Act.
- ✓ An important factor relates to the **design** capacity of the sewage works. A major change in 1997 (Services Improvement Act 1997) (Subsection 53(6.1) meant that some things that were previously exempt and approved by municipalities now must be approved by the Ministry of the Environment.
- ✓ If the sewage works has a design capacity in excess of 10,000 litres per day it now requires approval under the OWRA.

*To clarify further, (a) if a sewage system is larger than 10,000 L/d, it is an OWRA sewage works regardless of location; (b) if a single property contains several small systems (less than 10,000 L/d each) but the combined capacity of the systems exceeds 10,000 L/d, all those systems are OWRA sewage works regardless of their individual sizes; and (c) if the system is not contained entirely within the property of the building (or buildings) it serves, it is an OWRA sewage works regardless of the size of the system.<sup>21</sup>*

In addition, “a sewage works whose purpose is the site stormwater management...is therefore subject to the approval requirements of section 53 of the OWRA regardless of the size, location and ownership of the works.”<sup>22</sup> It is advisable in these cases to check with the municipality and local MOE office to determine if an approval in this case is required. The need for approvals is very site-specific.

What happens if you have a system previously approved by a municipality but it has grown? The major trigger is the design capacity of 10,000 litres per day. However, if you are expecting growth, you should consider establishing plant capacity that will allow the effective management of your wastewater over time. In addition, your design capacity should take into account the peak period, e.g., during crush, as well as the impact of peak periods where there may be visitors using any hospitality areas or wine-tasting areas.



## Applications for Approvals

### From MOE – Sewage Treatment Plants

The Ministry of the Environment produces a *Guide for Applying for Approval of Industrial Sewage Works*.<sup>23</sup> This is available on the web at <http://www.ene.gov.on.ca/envision/gp/3070e01.pdf>.

The guide is continually upgraded. The Ministry also notes that such guides should “not be construed as legal advice.” Likewise, the following is a summary of some of the major points only. You should refer back to your local Ministry office, the web document and other resources when you are considering changes to your system to ensure that you have the most up-to-date information.

The guide includes some general instructions, such as:

- who must apply
- when to file applications
- where to file applications
- the approval process
- public notification
- what happens if false information is given
- where to go if you have questions when filling out this information.<sup>24</sup>

The document provides a detailed series of instructions for completing the application form. Appendices include an overview of the approvals legislation (Appendix A), an overview of the environmental guidelines and procedures (Appendix B), contact details for the Ministry (Appendix C) and a summary of sewage works application costs (Appendix D).

There is an expectation that there will be research undertaken by you (e.g., through your consultant) before the application is lodged. Essentially, the more work undertaken at the front of the process, the less likely there will be delays in processing and approval. In either case, plenty of time should be given for the actual approval once all the research and paperwork is completed. The guide suggests that the applications for approval “should be filed at least 6–8 weeks prior to the planned date for commencing construction.”<sup>25</sup>

There is considerable work required in having an application ready before it is submitted for approval.

The first formal part of the process is the pre-application consultation with the local district office of the Ministry.

*When approaching the Ministry, the proponent should be prepared to discuss the nature of the proposal, identifying in general the industrial processes, proposed wastewater treatment and disposal options, expected effluent quality and environmental impacts, location of the proposed discharge point and any applicable requirements under other statutes, including the EBR (Environmental Bill of Rights), and any confidential information concerns. The Ministry will assist the proponent in identifying all provincial environmental acts, regulations, policies, objectives and guidelines applicable to the project, determine if a ground water or surface water impact assessment is required and outline the required scope of such an assessment, and provide information on the EBR and any other public consultation requirements. The Ministry will discuss with the proponent any special concerns that must be addressed in the application for approval.<sup>26</sup>*

More details of the requirements and the complete process are available through the guide, and the local MOE office.

## **From Municipalities**

If your disposal system will be under a design capacity of 10,000 litres per day, then approval must be obtained through the local or regional municipality. The approvals of applications and management of inspections may be undertaken at either the regional or local municipal level.

A good place to start is the public health office of the region. In Niagara Region, for example, the Regional Health Department is contracted by nine of the 12 municipalities to regulate the design, construction and approval of sewage systems.<sup>27</sup>

*A sewage permit, required under the Ontario Building Code Act, must be obtained from the region, or municipality, before any installation, extension or other alteration of a sanitary sewage system can take place. Inspections by the public Health Department or municipalities are made when there are applications for sewage system permits. Information gathered through the inspection include*

- *will a system fit on a given property size*
- *has consideration been given to future building expansions*
- *will the required clearance distances to wells, bodies of water, structures and property lines be maintained*
- *have soil properties and types been evaluated to determine the appropriate type of system*
- *land use, topography and drainage*
- *location and ease of servicing the system.<sup>28</sup>*

As with all permits and approvals sought from the MOE, a permit may be refused.

Haulers of septic waste now require a certificate of approval from the Ministry of the Environment.<sup>29</sup> If you have septic waste or any regulated waste, such as winery processing wastewater, taken off-site, you should ensure that the hauler has the appropriate approvals.

## Frequently Asked Questions

The following questions arose from the workshop held on January 18, 2005 to review the Draft of Understanding Requirements, subsequently titled Eco-Winegrowing 101. The responses have been provided by Mr. Rich Vickers of the Niagara District Office of the MOE. As in all of these issues, the responses reflect current legislation, which may change.

*At the workshop, some members indicated that they had been advised that if holding tanks were used and wastewater trucked off-site, then the holding tanks had to be twice the size of the largest tank on-site. Could you confirm if this is accurate?*

“Holding tanks for the storage of winery waste must be sized according to their anticipated use in accordance with good engineering practices and MOE Environmental Assessment and Approvals Branch requirements. Each case is evaluated separately on its engineering merits. Generally the length of time that wastewater needs to be considered as well as the volume of wastewater produced over that established period. As a safety measure additional volume must be added for contingency purposes.”<sup>30</sup>

*Could you also confirm that this applies only to sites where there is no treatment facility? That is, there is not an expectation that there shall be holding tanks on every winery site where there is treatment on-site or where there is material going to municipal waste systems.*

“Holding tanks will typically not be considered by the Ministry of Environment as a permanent solution for sewage management. If a winery possesses some type of approved sewage works for the treatment of their wastewater or disposes of their wastewater through the municipal sewer, then MOE would require that this system be modified to accommodate the additional flows. Please keep in mind that the winery may want to have a holding tank on hand as a contingency measure in the event of a spill.”<sup>31</sup>

*Discussion at the workshop also indicated that the Ministry did not consider that a holding tank was a permanent solution to wastewater management, but a treatment system of some nature would have to be approved and installed.*

“As outlined above, the use of a holding tank is an interim measure for a winery while they determine the type of wastewater treatment they wish to install.”<sup>32</sup>

*There was also interest in exploring different categories of wastewater and options available. For example, are there different categories of wastewater that can be reused (e.g., for flushing toilets) and other reuse options? If so, where could this information be found so that it can be made available to industry members?*

“The Ministry will consider site-specific applications of the reuse of effluent, provided that appropriate engineering safeguards are in place (e.g., separate plumbing systems, etc.). Currently, winery wastewater is sometimes reused through the vineyard irrigation system after the wastewater has undergone some type of treatment. Any proposed reuse of wastewater would have to be evaluated by a qualified professional and submitted for consideration by MOE engineers, together with an application for sewage works Certificate of Approval (Ontario Water Resources Act, S. 53). At this time, the Ministry does not have any information on reuse options for winery wastewater....”<sup>33</sup>

## Beyond the Rules

An important method of reducing the impact of wastewater is to reduce the amount of water used in the facility. As a first step, an assessment of the quality of water consumed, both in production and in hospitality areas, provides a benchmark for future water and cost savings. Examples of methods of reducing water consumption include:

- accurate water metering of water coming into different parts of the facility
- accurate measurement of water going off the facility as wastewater
- trigger guns on all hoses
- identifying savings in the use of water, e.g., in barrel washing, which consumes significant amounts of water
- use of high-pressure water for cleaning
- training of staff to be constantly aware of the need to reduce water use and be more efficient
- choice of surfaces, e.g., epoxy flooring is easier to clean and more hygienic than concrete.

A workshop on pollution prevention, or cleaner production was held with the wine industry in November 2004. The document Reducing Waste and Making Money A Concise and Practical Guide to Pollution Prevention in Wineries was developed by Enviro-Stewards Inc and produced by Environment Canada.

If wastewater systems are installed, then investigations of environmentally friendly wastewater systems that still comply with the requirements are an option.

---

## EastDell Estates

**EastDell Estates** has installed a biofilter system that imitates cattail marshes to treat the winery's wastewater. The system has drawn considerable attention for its environmentally friendly efficiency that treats the wastewater simply, naturally and relatively inexpensively.



# VINEYARD DRAINAGE

The installation of subsurface tile drainage is very common throughout Ontario. There is a range of legislation that covers drainage. New legislation and regulations, including watershed management, may have an impact on drains, outlets and drainage water in the future.

A person who has purchased land, or an existing landowner with vineyard drainage, needs to ensure that all of the appropriate checks are in place. In addition, they may find that they are located in the watershed of a municipal drain.

## Municipal Drains

The establishment of municipal drains provides responsibilities both for the landholder and the municipality. These are spelled out in the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) fact sheet *So, What is A Municipal Drain*,<sup>34</sup> available at <http://www.omafra.gov.on.ca/english/engineer/facts/01-059.htm>. More details are also available at your local municipal office.

If you have a municipal drain on your property you can expect municipalities to periodically arrange to enter the property and perform the necessary maintenance work. You will get billed for parts of this work, and can expect that there will be disruption on your property to some degree as the work takes place.<sup>35</sup>

As a landowner with a municipal drain on the property, you must ensure that you do not build (or plant grapes) on the area near the drain that the municipality has the right to use to maintain or repair the drain. While these areas may be planted for annual crops, installing longer-term infrastructure (such as a row of grapes) could see them removed if repairs to the municipal drain are needed.

Material such as brush and other floatable material should not be located near the drain. Heavy rain or storms can push it into drains, causing the drains to block. There are also restrictions on construction that can take place on municipal drains, such as installing a bridge or culvert. Owners have no authority to build culverts on municipal drains. Should you want a culvert to be built, you must contact the municipality first. Do not do it yourself: notify your municipality.<sup>36</sup> The municipality either constructs the culvert itself, when appropriate, or will assess whether the culvert is of the appropriate size and supervise construction.<sup>37</sup>

Another important aspect is that you **must not** pollute the drainage water. “Do not direct septic system waste, milkhouse wastes, barnyard and manure storage runoff or other pollutants directly to these drains.”<sup>38</sup> Wastewater from wineries must not contaminate drainage water.<sup>39</sup>

## Non-Municipal Drains

### Installation of Drains

In Ontario, the Agricultural Tile Drainage Installation Act regulates the installation of agricultural tile drainage. Details are available in *Agricultural Drainage Licensing*,<sup>40</sup> an OMAFRA fact sheet available at <http://www.omafra.gov.on.ca/english/engineer/facts/01-063.htm>. It should be noted that people installing tile beds should also be seeking advice and permission to connect tile bed systems to municipal drains.<sup>41</sup> Again, contact your municipality for details.

Drainage is a source of considerable dispute between neighbours and a complicated legal area. A good resource is *Top 10 Common Law Drainage Problems Between Rural Neighbours*,<sup>42</sup> another OMAFRA fact sheet, available at <http://www.omafra.gov.on.ca/english/engineer/facts/98-015.htm>.

### Maintenance of a Drainage System

The maintenance of a drainage system may be covered by a number of pieces of legislation. At the federal level, there is the Fisheries Act, while at the provincial level there is the Drainage Act and the Conservation Authorities Act.

The Fisheries Act is a powerful piece of legislation in Canada. It applies to inland waters of Canada and is binding on federal, provincial and territorial governments.

*When it comes to drain maintenance, Section 35(1) of the Fisheries Act is the part that most frequently applies. This section prohibits the harmful alteration, disruption or destruction of fish habitat, also known as a "HADD," unless authorized by the Minister of Fisheries and Oceans Canada. Unauthorized drain work that results in a HADD could result in a fine of up to \$1,000,000 and/or imprisonment. While work on open drains is done to meet requirements under the Drainage Act, requirements under the Fisheries Act must also be addressed.*<sup>43</sup>

The Conservation Authorities Act and the associated regulations provide authority to conservation authorities for conserving, restoring, developing and managing natural resources within their jurisdiction. Open drains are usually reviewed with special interest by Conservation Authorities.<sup>44</sup>

*The first step a landowner should take before starting any kind of ditch maintenance is to determine the type of drain it is. The local drainage superintendent should be contacted in order to determine if the ditch is a municipal drain constructed under the Drainage Act. If it is, then the landowner should not undertake any maintenance on the drain since this is a municipal responsibility and liability. If it is not a municipal drain, the local*



*municipality may also be able to tell the landowner if it is an Award Drain, Mutual Agreement Drain or a Private Drain. If it is a Private Drain, the maintenance of the ditch is the property owner's responsibility. If it is an Award Drain or Mutual Agreement Drain, the landowner needs to find the written records for that drain to determine if they are responsible for performing maintenance.*

*If the landowner finds that **they** are responsible for maintaining the drain (i.e., that it is not a municipal drain), the next step they should take before starting any kind of drain maintenance is to call the local Conservation Authority or the Ontario Ministry of Natural Resources (OMNR) office. Both can assist in getting information for dealing with reviews and approvals for drain maintenance work that might impact fish habitat. Chances are that the Conservation Authority will also have the expertise to help the landowners develop a proper drainage maintenance plan.<sup>45</sup>*

In Ontario, conservation authorities are the lead agencies and are often the delegated authority for Department of Fisheries and Oceans Canada (DFO) legislation. They are an important resource for water quality and natural resources information.

DFO recognizes the important contribution of agriculture to Ontario's economy. They also recognize the contribution fish habitats in agricultural drains make towards sustainable fisheries.<sup>46</sup> To help strike a balance among these needs, they have worked in partnership with conservation authorities. Municipal drains have been mapped and classified. This assists in streamlining the review of the effects of drain maintenance activities. Further details are available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/L2\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/L2_e.htm) and from your local Conservation Authority.

*The Drain Primer* produced by the DFO includes a range of options for drain maintenance that are endorsed by local agricultural organizations, and are more environmentally friendly in their impacts. This may be viewed at [http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelines-conseils/guides/drain-primer/drain1\\_e.asp](http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelines-conseils/guides/drain-primer/drain1_e.asp).

## **Drainage and Niagara Escarpment Development Control Area<sup>47</sup>**

In addition to the above considerations, there may be more requirements if you are located in the Niagara Escarpment Control Area. Within this area, the installation of a farm tile drain is specifically exempted from requiring a Development Permit if listed as a permitted use under the land use policies in the Niagara Escarpment Plan. (See Ontario Regulation 828/90, as amended.) Agricultural uses are permitted within all designations of the Niagara Escarpment Plan; however, only existing agricultural uses are permitted with the Escarpment Natural designation of the plan.



# WATERSHEDS, WATERCOURSES AND WATER QUALITY

## Watersheds

Everyone lives in a watershed. Likewise, every vineyard and winery is part of a watershed. A watershed is the area that drains into a watercourse and its tributaries. Watersheds are a geographic unit and as such may cross municipal, provincial or even international boundaries.

Watersheds are interesting because the activities on the land – such as vineyards and wineries – may not only have an environmental impact at a specific location, but can also have an impact downstream. Good environmental practice can assist in protecting water quality and the health of rivers and streams. The quality of the water in watercourses reflects the way that the land in the watershed is being managed.

One of the outcomes of the Walkerton incident and subsequent Inquiry has been a move to improve and protect water quality. As such, in Ontario, legislation has been passed to establish source water plans, which are being developed on a watershed basis. Currently, for example, watershed plans are being developed in the Niagara Region for Twelve Mile Creek ([http://www.conservation-niagara.on.ca/water\\_management/twelvemilecreek.html](http://www.conservation-niagara.on.ca/water_management/twelvemilecreek.html)) and Twenty Mile Creek ([http://www.conservation-niagara.on.ca/water\\_management/twentymilecreeksummary.htm](http://www.conservation-niagara.on.ca/water_management/twentymilecreeksummary.htm)) by the Niagara Peninsula Conservation Authority. Similar work is occurring across the province.

Both wineries and vineyards need to be aware of the development of these strategies, and be prepared wherever possible to contribute to them. One of the outcomes of the strategies is likely the identification of areas where on-ground works can improve the health of waterways and water quality. These areas may receive funding for remediation works.

Established under the Conservation Authorities Act, Conservation Authorities (CAs) have an important role in watershed management. As noted in the previous section on man-made drainage systems, CAs have legislative powers that both wineries and vineyard managers need to consider in watershed management, water quality and natural resources, and flooding management.

Working with municipalities, CAs also have a role in approvals for development. “Through a partnership with our 14 local municipalities and one regional municipality, staff work closely with municipal staff to further the conservation, protection, development and management of the area's natural heritage resources, as well as ensuring that life and property are not placed at risk from hazards associated with the natural environment and its processes.”<sup>48</sup>

It should be noted that undertaking best practice as it is being developed for *Sustainable Winemaking Ontario*, as well as ensuring that the practices for each of the sections outlined in other parts of this document, will be very positive for watershed management and maintaining and improving water quality. Management of nutrients, wastes, integrated pest management and the range of activities examined here are all important activities that impact watershed management.

## Watercourses

Watercourses are defined quite broadly. For example, Fisheries and Oceans Canada notes that “Lakes, reservoirs, rivers, streams, marshes, wetlands, canals, drains and even hay meadows under water can sustain fish life.”<sup>49</sup> (Further information is available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info_e.htm).)

The Niagara Conservation Authority says that a “Watercourse is constituted when there is sufficient continuous or intermittent flow of water to form and maintain a well defined channel, with beds and banks, of a permanent, yet dynamic nature.”<sup>50</sup>

If you are looking at work in or around water, you must comply with a number of pieces of federal and provincial legislation. At the federal level, this includes the Fisheries Act, the Historic Canals Regulations and the National Parks Act. At the provincial level this includes the Public Lands Act, the Lakes and Rivers Improvement Act and the Conservation Authorities Act.<sup>51</sup> The brochure *What You Should Know about Fish Habitat* outlines where to start for approvals and permits in Ontario. It is available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info_e.htm). It advises:

*Start by contacting one of the following agencies in your area:*

- *If your lot is in a watershed that has a Conservation Authority (CA) – contact your local CA office*
- *If there is no CA in your area – contact your local Ontario Ministry of Natural Resources (OMNR) office*
- *If your lot fronts onto the Rideau Canal, Trent-Severn Waterway or other federal lands – contact your local Parks Canada Agency (PCA) office.*<sup>52</sup>

These provincial bodies will guide you through the process of obtaining all necessary approvals required under provincial and federal regulations.<sup>53</sup>

- ✓ Secure any necessary work permits in advance of starting work.
- ✓ Be aware that, if approved, the conditions may include restrictions on the time of year when work can be done to avoid fish spawning periods, for example.<sup>54</sup> These timing restrictions are established by the Ministry of Natural Resources

and vary depending on the watercourse location and the fish species that use the watercourse.<sup>55</sup>

- ✓ Obtain a permit from the relevant Conservation Authority for a new watercourse crossing (e.g., bridge, culvert), upgrading an existing watercourse crossing or relocating a watercourse to accommodate a new vineyard.

You should also contact the Conservation Authority if you are considering developing a pond, or if you are proposing to build structures near watercourses, wetlands, valleys and other natural features, such as woodlots.<sup>56</sup>

Copies of application forms for the “Fill Construction and Alteration to Waterways” and similar application forms may be available on the web. For the Niagara Peninsula Conservation Authority, for example, these are available at <http://www.conservation-niagara.on.ca/planserv.htm>.

Again, if you are located within the Niagara Escarpment Area, additional requirements may apply. Within the Niagara Escarpment Development Control Area, the creation of ponds is permitted in the Escarpment Protection Area and Escarpment Rural Area of the Niagara Escarpment Plan as an incidental use, provided the impact on the natural environment is minimal. As a permitted use, ponds require a Development Permit unless they are a “farm pond”; then they may be exempted under certain conditions.

A dug farm pond accessory to general agricultural development is exempt from requiring a Development Permit, if the following conditions are met on the completion of the development permit:

- the pond is not located within the Escarpment Natural Area of the Niagara Escarpment Plan
- the pond does not need construction of a dam or berm and is not located on a stream or watercourse
- the surface area of the pond is located at least 30 metres (98.4 feet) from the nearest lot line and from any septic system or well
- the surface area of the pond is not greater than 150 square metres (1614.6 square feet)
- the area of the lot is at least 20 hectares (50 acres)
- the dredged material is used for landscaping immediately around the pond site and rehabilitated with vegetation.

As always, check with the Niagara Escarpment Commission if you have queries.

## Water Quality

Water quality in a watercourse provides an indication of the health of the watershed. All activities on the land may impact, positively or negatively, water quality. In addition to activities already discussed in the Water and Wastewater sections, land and vegetation management is also important.

Section 36 of the federal Fisheries Act states that no one may deposit a deleterious (harmful) substance in water frequented by fish. A deleterious substance includes silt/soil that comes off of a field into a watercourse (e.g., where best management practices have not been employed).<sup>57</sup> Vineyard management practices combined with the use of vegetation as buffer strips along watercourses can help reduce this risk. Likewise, wineries can provide natural habitat along watercourses and protect natural features and vegetation.

Conservation authorities have programs to assist landholders in the creation and restoration of vegetated buffers. This includes financial assistance. Technical advice and assistance are also available.

The Niagara Peninsula Conservation Authority has the following programs.

ELIGIBLE ITEMS	GRANT RATE	GRANT CEILING
Habitat restoration, including buffer strips, wetlands and riparian creation or protection, floodplain and fragile land retirement, reforestation of sensitive lands or connecting fragmented woodlands	Up to 75%	Up to \$10,000
Livestock restrictions, alternative watering systems and crossings	Up to 75%	Up to \$10,000
Conservation farm practices, including erosion control structures, sediment control basins, bank stabilization, grassed waterways, spillways, rock chutes, etc.	Up to 75%	Up to \$5,000

Further information on these programs is available from the offices or at its website. This includes:

- *Buffers Are Better Water Quality Improvement Program* at <http://www.conservation-niagara.on.ca/pdf/buffers.pdf>
- *Water Quality Improvement Program* at <http://www.conservation-niagara.on.ca/pdf/waterquality.pdf>
- *Wetlands Are Worth It Water Quality Improvement Program* at [http://www.conservation-niagara.on.ca/pdf/Wetland\\_Brochure\\_final.pdf](http://www.conservation-niagara.on.ca/pdf/Wetland_Brochure_final.pdf).

# WASTE

## Wineries

### Fruit Waste – Pomace

One of the waste products that must be considered in the wineries is pomace, or marc, the residue from pressing. Marc typically consists of skins, seeds and stems of the pressed grapes.

The Ministry of the Environment has established a “Protocol for the Utilization of Waste Fruits on Agricultural Lands.”<sup>58</sup> This is not available on the website but may be obtained through local MOE offices. The protocol describes:

*the criteria governing the use of waste fruits as soil conditioning agents on agricultural lands.... They apply only to the spreading of solid waste fruits which have not been altered by chemical or thermal processing and for which the consent of the land owner or lessee has been obtained.*<sup>59</sup>

No application is permitted where the annual application rate exceeds 150 tonnes per hectare.

Grapes for winemaking are referred to specifically:

*Fruit culls and fruits which have been physically processed such as by washing, brushing and crushing are acceptable. The heating of grapes to sub-pasteurization temperatures during wine making is also acceptable as it does not significantly alter the waste for the purposes of land application.*<sup>60</sup>

The MOE has advised that the temperature issue is very important. If the grapes are heated to pasteurization temperatures, then they are not to be applied to land as outlined in the protocol.<sup>61</sup>

Here are some of the protocol’s key management practices.<sup>62</sup>

- Ensure waste fruits are free of other material, such as packaging plastic or wire.
- Base application rates on the nitrogen content of the waste fruit and the nitrogen demand of the agricultural crop.
- Take into account the practicality of incorporating the material into the soil, the desired amount to be left as soil cover and any potential environmental impact.
- Account for the total material applied as you set the application rate. For example, if other waste fruits or sewage sludge have been applied, then the rate would be reduced.

- Make sure application won't lead to pest and diseases. The local OMAFRA office can assist.
- Test soil periodically. For example, pH can be affected by repeated applications of waste fruits.
- Follow recommended separation distances:
  - 15 metres from dug or drilled wells
  - 90 metres from individual residences
  - 450 metres from a residential area
  - 45 metres from a surface water body.
- Consider storage needs for the material.

Within the Niagara Escarpment Development Control Area, a Development Permit for the application of manure or sewage sludge or other non-agricultural wastes to the land is not required. However, if an application is made for a Development Permit for a horse barn, for example, the Niagara Escarpment Commission would want to be assured that the applicant could satisfy the requirements of the Nutrient Management Act. This would be required as a condition of the Development Permit.

## **Frequently Asked Question**

*Does an application to land require an approval for a land application?*

The protocol implies an approval is required in some cases.

Note that tank bottoms, lees and musts are considered wastes as they are not defined in the protocol and must not be applied to land.<sup>63</sup>

## **Beyond the Rules**

Pomace can be a resource. It can also be composted on-site or shipped (with the correct approvals) to a producer for conversion into compost and organic fertilizer. If waste fruit is wholly recyclable, then MOE approvals are not required for land application or movement of waste.

## **Hazardous or Liquid Industrial Waste**

### **Wineries**

It is important to correctly manage waste that is defined as hazardous or liquid industrial. There are issues of liability and potential for legal action if appropriate measures are not put in place.

As wineries expand and do more in-house laboratory work, they need to be aware of and manage potentially hazardous waste.

Hazardous waste is defined as any waste that is corrosive, ignitable or toxic and harmful to human health and the environment. Hazardous wastes range from common household products like cleaning products, used oil, and oil-based paints to complex chemicals used in the dry cleaning industry and during manufacturing processes.<sup>64</sup> Further information on hazardous waste may be found at <http://www.ene.gov.on.ca/envision/land/hazardousWaste.htm>.

Hazardous or liquid industrial wastes in the winery setting can include waste cleaners, solvents, cleaners, waste pesticides, oils and lubricants.

Hazardous or liquid industrial wastes require special approvals and tracking systems to make sure that they are not inappropriately lost to the environment.

Regulations 347 and 558/00 outline the process for deciding if an operation is generating hazardous waste or industrial waste.

*Regulation 347 requires waste generators to evaluate their waste and if found to be Hazardous or Liquid Industrial to register them with the Ministry of the Environment (MOE). It is an offence to store, process, dispose or transport such wastes in Ontario unless a Generator Registration document for the generator has been posted on the Hazardous Waste Information Network (HWIN), accessible from the MOE website.<sup>65</sup>*

There are some exemptions for small quantities of waste generated, depending on which type of waste is involved. For example, if you have hazardous industrial waste, **“the small quantity exemption is 5 kg per month**. If you generate more than 5 kg in a one-month period, or accumulate more than 5 kg on your site over any period, registration is required. Empty containers and inner liners are not hazardous.”<sup>66</sup>

Appendix 2 of the document by MOE outlines the waste classes that need to be considered. The following table is an example of the types of waste that should be typically monitored by wineries.

### WASTE TYPES TO BE MONITORED

MOE CODE	NAME	EXAMPLES
114	Other inorganic acid wastes	Off-specification acids; by-product hydrochloric acid; dilute acid solutions; acid test residues
148	Miscellaneous waste inorganic chemicals	Waste inorganic chemicals including laboratory, surplus or off-specification chemicals that are not otherwise specified in this table
<i>ORGANIC WASTES</i>		
212	Aliphatic solvents and residues	Acetone, methylethylketone and residues, alcohols, cyclohexane and residues
213	Petroleum distillates	Varsol, white spirits and petroleum distillates
241	Halogenated solvents and residues	Spent halogenated solvents and residues such as perchloroethylene, halogenated still bottoms; residues and catalysts from trichloroethylene and carbon tetrachloride (dry cleaning solvents); halogenated hydrocarbon manufacturing or recycling processes
251	Waste oils/sludges (petroleum based)	Oil/water separator sludge; dissolved air flotation skimming; heavy oil drainage; slop oil and emulsions
252	Waste crankcase oils and lubricants	Soluble oils; waste-cutting oils; machine oils
263	Miscellaneous waste organic chemicals	Waste organic chemicals including laboratory surplus or off-specification chemicals that are not otherwise specified in this table
<i>COMPRESSED GASES</i>		
331	Waste compressed gases, including cylinders	Methane (natural gas); nitrous or nitric oxide; propane; butane

Source: Appendix 2 MOE Waste Classes, available at  
[http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2000/ra00e0002d\\_02.pdf](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/ra00e0002d_02.pdf).

The full outline of the guidance for registration is contained in *Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste*, available from the MOE website at  
[http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2000/RA00E0002.htm](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/RA00E0002.htm).



Wineries need to be able to measure, monitor and track materials that could be classified as liquid industrial and hazardous waste, and make sure they are being managed appropriately.

### *Key Considerations*

- ✓ Identify someone at your winery who will be in charge of this process and who has responsibilities under the Regulation. At the least you need to be able to identify a “responsible official” as part of the Generator Registration Report.<sup>67</sup>
- ✓ Identify whether your winery is a generator of hazardous or industrial waste as defined by the Ministry of the Environment.

How do you tell if material needs to be registered? The MOE document is Regulation 558/00, which amended Regulation 347. A guide is available on the MOE website at [http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2000/RA00E0002.htm](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/RA00E0002.htm).

This guide is the *Registration Guidance Manual for Generators of Liquid Waste and Hazardous Waste*.<sup>68</sup>

If your winery generates sufficient waste that is of a hazardous nature **or** waste from an industrial process, then you are a generator who must register.

- ✓ Register with the MOE by the 15<sup>th</sup> of February annually. This is can be done electronically. There is an annual fee. If your Generator Registration Number expires, you will not be able to ship hazardous waste off-site until you have re-registered.

The MOE reports that online registration is becoming common.

*Through the Hazardous Waste Information Network (HWIN), electronic access is available to register, review and update your Generator Registration records. You can also use HWIN to prepare and submit waste manifests. You may obtain access to HWIN by simply logging on to the Ministry’s website at: <http://www.ene.gov.on.ca>.*<sup>69</sup>

The waste that is being generated, and the containers that it comes in, need to be managed in an appropriate way.

- ✓ Register all “subject wastes”<sup>70</sup> generated at the site, even if they are not shipped off-site.<sup>71</sup>

## Frequently Asked Questions

*If a winery has hazardous waste and industrial waste, and has registered as required, and now needs to move the material off-site, what happens then?*

You must be able to comply with the federal and provincial dangerous goods transportation requirements. This means filling out a provincial numbered manifest form, which is available electronically and in hard copy. Numbered manifests are also available electronically on HWIN, through the Ministry's website.<sup>72</sup>

As a generator, you are responsible for filling in Section A of the manifest while the Carrier is responsible for Section B. Carriers must also be registered with the Ministry of the Environment to accept the waste and transport it.

There are particular times when you must make sure that you notify the MOE through HWIN if significant changes have taken place.

*Significant changes include:*

- *change in company name, address or telephone number*
- *change in responsible officer or contact for the generator*
- *addition of registerable wastes*
- *change in Waste Characteristic or Waste Class.*<sup>73</sup>

**What does the "responsible person" do?**

The guideline states:

*You must include the name and telephone number of a contact person at the generating site authorized to access the Generator Registration Document on the Ministry's website. This person should be familiar with the wastes and in charge of their management. He or she should be able to answer technical questions relating to the Generator Registration Report and be able to provide assistance in the event of an emergency.*<sup>74</sup>

**Can a consultant sign the report?**

No. Consultants or others who are not employees of the generator cannot sign.<sup>75</sup>

**Are there exemptions for registering?**

Yes, quite a number. Exemptions are included on pages 6–10 of the guideline.

**Please note that this information is in summary form only. You should review the Regulation and guideline yourself to determine whether you are exempt.**

Important exemptions include the following materials:

- **hauling sewage, or septage.** Note though that while you may be exempt as a generator, **haulers** of the waste are required to have a Certificate of Approval for a waste management system for both transport and application. In addition, the site that the wastes are to be applied to must also have a Certificate of Approval for a waste disposal site to accept these wastes.<sup>76</sup>
- **sewage sludge,** but only from privately owned sewage works that only receive characterization to domestic sewage, are exempt.
- **small quantity exemptions** are provided for some waste types under the definitions of liquid industrial waste and hazardous waste.<sup>77</sup>
- **food processing wastes** (for liquid industrial wastes). To quote:

*Non-hazardous wastes from the processing of food are exempt. These wastes can include those from food packing, food processing, food preserving, wineries and cheese making facilities. Grease and other liquid wastes from restaurants and other food preparation facilities are also included in this exemption.*<sup>78</sup>

This exempts winery processing waste from being registered and manifested but it is still considered municipal waste and must be hauled by an approved carrier to an approved site.<sup>79</sup>

#### ***Will the Ministry of the Environment confirm that I have registered properly?***

The MOE will not send out a paper confirmation. Step 3 of the document outlining the procedure notes that “It is your responsibility to ensure that a Generator Registration Document for your facility has been posted on the Ministry’s website and that all information is correct.”<sup>80</sup>

Likewise, the Ministry does not take responsibility for checking if you have chosen the right classification numbers. “If, due to new information or re-assessment of information submitted, you feel the waste is inappropriately classified, you should revise your Generator Registration Document with a supplemental registration.”<sup>81</sup>

## **Beyond the Rules**

Identifying opportunities for reducing waste and creating cleaner production are important for both for the environment and making more efficient businesses. Consider adopting these practices:

- Identify equipment options for filtering, such as new generator filter systems. For example, cross-flow filter systems have no consumable filter aids and no diatomaceous earth or filter pads, which reduces waste produced. It also reduces costs for transportation and landfill.

- Identify the least hazardous cleaning products that still comply with health requirements.
- Recycle cardboard and other packing materials. Provide every opportunity to capture wine bottles and recycle them.

## **Growers**

There are a number of exemptions to the legislation in relation to hazardous wastes. Agricultural wastes are exempted from the obligations outlined above.

This exemption also applies to waste that otherwise could be considered hazardous, such as used oil from machinery, tractors and the like. If, as a grower, you arrange for your waste oil to be picked up and sent for appropriate disposal, then you do not have to register as a generator of hazardous waste, nor fill in manifests. However, once the waste has been collected and taken to another location, the receiver of that waste and any future transporter would need to comply with the hazardous waste legislation.

Growers do, however, remain liable under other legislation should any waste (e.g., oil) contaminate properties or water off-site. This is always a risk when waste oil is used for dust suppression. Furthermore, this is an undesirable practice as it can contaminate land and reduce values.

More information on this topic is available through your local MOE office.

## NUTRIENT MANAGEMENT

One of the outcomes of the Walkerton tragedy has been a focus on better management of waste that might otherwise contaminate surface water and groundwater. In particular, legislation and regulations either have been passed or are being developed to provide more control over nutrients used in agricultural and non-agricultural practices.<sup>82</sup>

The Nutrient Management Act, 2002, supported by the Regulation 267, came into effect in 2003. Here is an outline:

*The Act (Subsection 5 (2)) sets out the types of regulations that could be made or may be made to regulate the management of materials containing nutrients. The subjects include the buildings used for storing nutrients, qualifications and testing for persons who handle nutrients, licensing of persons who apply nutrients to land, nutrient management plans, nutrient management strategies, environmentally responsible practices, administrative procedures and the establishment of local advisory committees.*<sup>83</sup>

The act and regulations have addressed three activities that apply to **all** agricultural operations. These are:

- a ban on high-trajectory guns
  - high-trajectory application for nonagricultural source material was banned, effective September 30, 2003
  - the use of high-trajectory systems for manure was banned, effective March 31, 2005 or earlier.
- a ban on land application of sewage biosolids from December 1–March 31 and anytime the ground is frozen or snow-covered
- the application of nonagricultural source materials must be at least 20 metres from (the nearest bank) of surface water.<sup>84</sup>

The practical implications of the legislation continue to be established. In the main, if you receive nutrients from an agricultural establishment such as a hog, beef or hen production farm, you must ensure that all activities are being managed in accordance with the regulations. That may include the establishment of nutrient management plans for your operations. For further information see <http://www.omafr.gov.on.ca/english/agops/index.html>.

Wineries and growers should also refer to the previous section on the management of pomace waste. This material is likely to be considered as a nutrient and in the future is likely to be part of the considerations under the Nutrient Management Act.

# PESTS AND PESTICIDE MANAGEMENT

Any move towards sustainable grape growing requires an intimate knowledge of the soils, vines and tools available. Pesticides are only one of the suite of tools that are considered as part of Integrated Pest Management (IPM).

Before there are any chemicals used to manage pests – weeds, insects and fungi – there is a need for active monitoring in the vineyard. Active monitoring is used to determine the presence and degree of disease or pests. Monitoring will also assist in identifying new pests in the vineyard. The Multicoloured Asian Lady Beetle (MALB) is an example of a relatively new species that can have an impact. It is highly likely that new species and diseases will emerge. Routine monitoring will allow you to more quickly identify these new risks and help to get a quick response from government and industry sources.

Domestic and international trends mean that both wineries and growers can expect calls for increasing accountability and transparency in relation to pest management practices. Greater emphasis will be placed on IPM as the key tool for management of vineyards.

## Pesticide Regulations

There are a significant number of regulations and requirements associated with the use and management of pesticides.

### *DISTRIBUTION OF PRINCIPAL RESPONSIBILITIES FOR PESTICIDE REGULATION*

DISTRIBUTION OF PRINCIPAL RESPONSIBILITIES FOR PESTICIDE REGULATION		
FEDERAL (PMRA)	PROVINCIAL/TERRITORIAL	MUNICIPAL
PCPA and Regulations	Transportation, sale, use, storage and disposal	By-laws for municipal (and, in some cases, private and residential) lands only
Pesticide registration and re-evaluation	Training, certification and licensing of applicators and vendors	
Human health and safety	Spills and accidents	
Environmental impact	Permits and use restrictions	
Value (including efficacy) assessment	Compliance and enforcement	
Alternative strategies		
Compliance and enforcement		

Source: Pest Management Regulatory Agency (PMRA) website at [http://www.hc-sc.gc.ca/english/media/releases/2002/2002\\_17bk3.htm](http://www.hc-sc.gc.ca/english/media/releases/2002/2002_17bk3.htm).

## Federal

Pesticides are registered for use at the federal level through the Pest Management Regulatory Agency (PMRA) of Health Canada. Their website is at <http://www.pmra-arla.gc.ca/>.

The federal Pest Control Products Act (2002) received Royal Assent in 2002 and came into effect on June 28, 2006. Some of the key changes from the Act include:

- requiring special protection for infants and children
- taking into account pesticide exposure from all sources, including food and water
- considering cumulative effects of pesticides that act in the same way
- supporting pesticide risk reduction, e.g., by ensuring that only pesticides that make a useful contribution to pest management are registered
- expediting the registration of lower-risk products.<sup>85</sup>

Other changes include making the registration system more transparent and strengthening the post-registration control of pesticides.<sup>86</sup>

Pesticides currently registered for use will be undergoing review by the PMRA. A number of pesticides that have been reviewed have been phased out under the review process.

There are maximum residue limits for pesticides. The amounts of the residues are established under the Food and Drugs Act.<sup>87</sup> The Canadian Food Inspection Agency (CFIA) also has a role in monitoring pesticide residues through its National Chemical Residue Monitoring Program. This includes taking samples from the normal food supply and testing them for chemical residue. The outcomes of the testing are then reported publicly.<sup>88</sup>

Maximum residue limits set by the PMRA in the labeling process are not necessarily the same as those set by the Liquor Control Board of Ontario (LCBO) in their testing regime. Maximum residue limits set by the LCBO for finished wines are sometimes more stringent than those set by the PMRA for fresh produce (grapes).<sup>89</sup>

## Provincial

### *OMAFRA*

In addition to the testing of wines, grapes delivered to wineries for processing are sampled on a regular basis. The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) may also test grapes for residue. If high residues are found, then a track-back system is triggered and individual batches of grapes and juice will be assessed. You will be required by the Ministry to show your spray records if requested.<sup>90</sup>

## **LCBO**

The LCBO also has rigorous testing programs and standards. It undertakes 380,000 tests a year over 16,500 products. Testing takes place for pesticide residues, heavy metals and other contaminants. All wines submitted to the LCBO for sale on its premises are analyzed before the decision is made to purchase, and random sampling continues after the product is received. Sampling is also undertaken on other Ontario wines, including VQA wines.

Products sold by the LCBO but not warehoused by it (i.e., direct deliveries to LCBO stores) must undergo annual laboratory testing for compliance with LCBO chemical and labeling guidelines.

- ✓ Each Ontario winery must make the necessary arrangements for annual product testing.

If the permitted levels are exceeded, and the product is currently on the market, the LCBO may issue a Class 1 recall (public notice) or Class 2 recall action.<sup>91</sup>

## **MOE**

In Ontario, the Ministry of the Environment (MOE) is responsible for regulating pesticide sale, use, transportation, storage and disposal under the Pesticides Act and Regulation 914. "All pesticides must be used in accordance with the requirements of the *Pesticides Act* and Regulation 914. The Act and regulation are available on the e-laws web site at [www.e-laws.gov.on.ca](http://www.e-laws.gov.on.ca) or by calling the Publications Ontario toll-free number: 1-800-668-9938 or 416-326-5300."<sup>92</sup>

Anyone who wishes to buy, transport, handle or apply commercial pesticides must have completed the Grower Pesticide Safety Course every five years. This training is run through Ridgetown Agricultural College. Details may be found by calling the Agriculture Contact Centre at 1 877 424-1300.

## **Municipal Rules and Wineries**

In Ontario, a number of municipalities have passed by-laws to ban the use of pesticides for "cosmetic" uses. In general, this usually refers to pesticides used for turf and horticultural management. In contrast, in Quebec, the province has banned the use of such pesticides.

Wineries should be aware of this trend and consider alternative landscaping measures, such as using different landscaping material and different horticultural practices.



## Management

OMAFRA provides advice on effective management of pests, and the safe handling of pesticides. Every two years, OMAFRA produces Publication 360: *Fruit Production Recommendations*, which updates approaches and regulations for a number of commodities, including grapes.<sup>93</sup> A supplement to Publication 360 is produced in the off-years. This is available through the OMAFRA website at <http://www.omafra.gov.on.ca/english/crops/pub360/p360toc.htm>, and from OMAFRA offices and pesticide dealers. An additional resource is OMAFRA Publication 75 Guide to Weed Control, which covers all the herbicides used in vineyards.<sup>94</sup> This is available at <http://www.omafra.gov.on.ca/english/crops/pub75/p75toc15.htm>.

Four of the important chapters related to pesticides and grapes in Publication 360 are Chapter 1: Precautions with Pesticides; Chapter 2: Pesticide Application; Chapter 4: Integrated Pest Management; and Chapter 9: Grapes. This document will not duplicate that material but highlight **some** of the essential requirements.

ACTION	LEGISLATION/AUTHORITY	PAGE NUMBER
You must report all major spills, fires or thefts involving pesticides to the MOE.	Regulation 914, S. 29	1
If a pesticide spill causes, or is likely to cause, an adverse effect you <b>must</b> notify the MOE Spills Action Centre <b>and</b> your local municipality.	Regulation 914. (available on the web at <a href="http://www.e-laws.gov.on.ca/DBLaws/Regs/English/900914_e.htm">http://www.e-laws.gov.on.ca/DBLaws/Regs/English/900914_e.htm</a> )	12
You must be a certified grower or licensed exterminator to buy and use schedule 1, 2 or 5 pesticides.	Regulation 914 (available on the web at <a href="http://www.e-laws.gov.on.ca/DBLaws/Regs/English/900914_e.htm">http://www.e-laws.gov.on.ca/DBLaws/Regs/English/900914_e.htm</a> )	2
Make sure you comply with minimum times required between the last spray application and harvest.	Wineries may have requirements for longer withholding periods	6 and 201
Keep records of all spraying, including date, material used and rate or amount.	Required by wineries Also need to comply with Maximum Residue Limits for pesticides established under Food and Drugs Act	293
It is an offence to introduce any material into water that may be harmful to fish or fish habitat. You must have a suitable setback distance from both the riverbank and the water body.	Fisheries Act  Note that OWRA Section 30 would also apply	8.
Dispose of empty containers appropriately	Regulation 914 of the Pesticides Act, S. 27	9 and 11

Source: Derived from OMAFRA, *Fruit Production Recommendations 2006-2007*, Publication 360.

General precautions outlined in Chapter 1 concern the protection of oneself, other people, livestock, pets, water and sensitive crops while using pesticides, as well as the prevention of accidental releases of pesticides.<sup>95</sup>

Pesticide Application (Chapter 2) provides guidelines on different types of spraying systems; the weather considerations for spraying; and practical issues for pesticide application; cleaning the sprayer; and sprayer calibration.<sup>96</sup>

Chapter 4 provides a framework for IPM.

*Integrated Pest Management (IPM) is an approach to contain pest control that considers all management options to maintain pests below an economic injury level. Tools for the management of pests include cultural, physical, biological, behavioural and chemical methods. With IPM, adverse effects of pesticides are minimized and economic returns are maintained.*

*IPM programs make extensive use of information collected in the cropping system and require careful management by the grower. To implement an IPM program you must have a thorough knowledge and understanding of:*

- *pest identification, biology and behaviour*
- *beneficial organisms*
- *monitoring techniques*
- *use and timing of appropriate management tools*
- *record keeping*
- *resistance management techniques*
- *weed management*
- *sprayer calibration.*<sup>97</sup>

IPM relies first and foremost on a regular, reliable and consistent monitoring throughout the season. Such services are available from established private companies so that the vineyard or winery operator does not have to become an expert in IPM themselves.

Chapter 9 focuses on grapes.<sup>98</sup> It includes more detailed information on diseases and insects, along with spray regimes and IPM approaches such as mating disruption. Again, careful monitoring of the vineyards is a key to success.

It should be noted that there are extensive lists of resources included in the book's Appendices, including OMAFRA Advisory Staff (Appendix A); Ontario Environment Pesticides Control Offices (Appendix C); Suppliers of Pest Monitoring Equipment and Biological Control Agents (Appendix F) and OMAFRA Fact Sheets and Publications available for Fruit Growers (Appendix H).

## Storage Issues

For both wineries and grape growers, it is important that pesticides be stored in a proper and safe manner. Under the Pesticides Act, it is illegal to store pesticides in unsafe conditions.

Pesticides must not be stored in close proximity to food or water. Your facility must be set up in the following way.

- ✓ Plan your storage facility so that:
  - there is no contamination of food or drinking water
  - fumes are vented to the outside atmosphere
  - there must be an impervious floor and a curb that will contain spills, and chemical warning signs must be prominently posted.<sup>99</sup>

OMAFRA's fact sheet *Pesticide-Handling Facility* is available at <http://www.omafra.gov.on.ca/english/engineer/facts/94-037.htm>.<sup>100</sup>

In addition to pesticide storage, care must be taken to ensure that fertilizers and fuel are also stored according to the appropriate regulations. In addition to health and safety concerns, a key issue is to ensure that there is no movement of material off-site, through contamination of land or water.

## Pesticide Container Rinsing

Pesticide containers must be managed and handled properly after the pesticide is used. Inappropriate management of pesticides, particularly if it causes contamination, can be an offence under both federal and provincial acts and their regulations. As much as three per cent of the original contents may remain in a pesticide container even after five minutes of draining.<sup>101</sup>

OMAFRA's fact sheet *Precautions with Pesticides: Disposal of Pesticides and Empty Pesticide Containers* provides details of rinsing procedures as well as disposal of the containers once they have been rinsed appropriately.<sup>102</sup> This is available at <http://www.omafra.gov.on.ca/english/crops/resource/1disposa.htm>.

## Pesticide Application

In addition to resources already noted, there are many sources of information on safe pesticide application. One is an OMAFRA fact sheet *Reducing Pesticide Drift and Crop Damage*. This is available on the web at <http://www.omafra.gov.on.ca/english/crops/facts/88-118.htm>.

The fact sheet provides an outline of practical ways to increase the efficiency of applying pesticides. The following extract highlights the importance of the legislation in this area.

*It is important to be aware that anyone using pesticides is responsible for their safe application. Should there be any impairment of the quality of life or environment in the use of a pesticide, charges could be laid against the applicator under Section 3 of the Pesticide Act. Section 3 is reproduced here in its entirety to illustrate how all encompassing this legislation is with regards to a violator.*

*Section 3. No person, whether acting or not acting under the authority of a license or permit under this Act or an exemption under the regulations, shall deposit, add, emit or discharge or cause or permit the deposit, addition, emission or discharge of a pesticide or of any substance or thing containing a pesticide into the environment that,*

- a. causes or is likely to cause impairment of the quality of the environment for any use that can be made of it greater than the impairment, if any, for such use that would necessarily result from the proper use of the pesticides;*
  - b. causes or is likely to cause injury or damage to property or to plant or animal life greater than the injury or damage, if any, that would necessarily result from the proper use of the pesticide;*
  - c. causes or is likely to cause harm or material discomfort to any person greater than the harm or material discomfort, if any, that would necessarily result from the proper use of the pesticide;*
  - d. adversely affects or is likely to affect adversely the health of any person to a greater degree than the adverse effect, if any, that would necessarily result from the proper use of the pesticide;*
  - e. impairs or is likely to impair the safety of any person to a greater degree than the impairment, if any, of the safety of any person that would necessarily result from the proper use of the pesticide; or*
  - f. renders or is likely to render, directly or indirectly, any property or plant or animal life unfit for use by man to a degree greater than the unfitness, if any, that would necessarily result from the proper use of the pesticide.*
- 1973, C. 25, S. 3.<sup>103</sup>*

Practical methods to reduce spray drift are provided in a number of publications provided by OMAFRA. For example, Publication 75 *Guide to Weed Control* available at <http://www.omafra.gov.on.ca/english/crops/pub75/p75toc15.htm> includes the following:

*Spray only when winds are light to moderate (less than 11 km/h). If you notice drift is occurring because of the wind, **stop spraying** until the wind subsides. Do not apply*

*pesticides if the wind is blowing towards susceptible crops or environmentally sensitive areas such as watercourses.*

- *Read the product label for information regarding buffer zones, water volumes and recommended nozzles.*
- *Use buffer zones around all watercourses and wells and neighbouring fields that contain sensitive crops. If the label does not state a specific buffer zone distance, leave an untreated area of natural vegetation.*
- *Select the recommended sprayer application rate (L/ha).*
- *Select the correct nozzle. Where practical, use air induction/venturi nozzles. These nozzles significantly reduce drift when compared to conventional nozzles.*
- *Select the correct nozzle-to-target distance.*
- *Use spray plume protection where practical or available (hoods, shrouds, screens and air curtains).*
- *Use drift-reducing adjuvants in the spray tank as directed by the label.*
- *Utilize wick weeders, instead of spraying, when possible.”<sup>104</sup>*

## **Contamination of Farm Water**

You must make sure that you protect water supplies. It is an offence to contaminate surface and ground water with pesticides. To protect water supplies:

- always read the label every time before applying a pesticide product
- keep concentrates above floodplain in locked storage
- triple-rinse, and properly dispose of empty pesticide containers
- mix concentrates and water 30 metres or more from water supply
- use appropriate buffer zones and berms to avoid surface water contamination by spray drift or runoff waters
- draw drinking water supplies from a separate well
- do not spray within 10 metres of shallow wells or 5–10 metres of other water supplies.<sup>105</sup>

Remember that labels can change from year to year. As such, you cannot assume that the precautions last year will be correct every year. It is essential to read the label.

Contamination of surface water is an indictable offence under provincial legislation, including the Pesticides Act, the Water Resources Act, and the Environment Protection Act.<sup>106</sup> It may also be an offence under the federal Fisheries Act.

Contamination may be direct or indirect. Direct contamination can occur with careless handling of concentrates. Pesticides stored near water supply areas can leak from containers, and unrinsed containers left near or in streams can contaminate surface water.

Another means of direct contamination is from the filling of spray equipment. Spillage and other accidents can prove hazardous to human, livestock and wildlife health. Residues in well waters can be up to 500 times in concentrations caused by spray drift or indirect contaminations.<sup>107</sup>

Finally, direct contamination can also occur with pesticide spray drift. This type of contamination is another reason to ensure that buffer areas are in place near water sources.

Indirect contamination has been identified through surface runoff and through subsurface drainage water.

## Beyond the Rules

Grapegrowers and wineries have been trialling different approaches for grape growing.

---

### Viticultural Roundtable of Southwestern Ontario

The Viticultural Roundtable of Southwestern Ontario was founded in 1994 after a serious winter freeze incident that had damaged the vineyards in southwestern Ontario. During follow up discussions and field-visits it was noted that sharing information and the exchange of ideas and practices would be of benefit.



The topics discussed at the Roundtable revolve around the practical aspects of grape-growing:

- Pruning, Plant protection, Nutrition, Organized Scouting, Seminars and Workshops , update-sessions

Some of the work in progress with the Roundtable includes:

- Ongoing plans to establish a sustainable protocol for the vineyards
  - A wine makers field walk, giving growers and wineries the opportunity to assess varieties from the viticultural aspects to the finished wine (from growing to marketing )
  - An annual presence at the Essex County Fruit and Vegetable Growers convention in order to help with the growth of the industry
  - Lectures and seminars on grape-growing for interested persons and parties.
  - Visits and contacts with the grape-growing neighborhood, for example Ohio and Michigan.
  - Variety trials and evaluations, There are about 20 varieties currently being tested.
  - Website [www.ontariograpes.com](http://www.ontariograpes.com)
-

Organic production systems are also being explored in grape growing and wineries.

---

### **Frogpond Farm Organic Winery**

Frogpond Farm located in the Niagara Region does not use insecticides, herbicides, synthetic fungicides or chemical fertilizers. All the wines are organically grown, processed and certified by Organic Crop Producers & Processors.





## AIR EMISSIONS

In July of 2004, the Ontario government announced a five-point action plan to reduce industrial emissions. The plan set new, tougher nitrogen oxide (NO<sub>x</sub>) and sulphur dioxide (SO<sub>2</sub>) limits for more industrial sectors, and added to the list of air toxins for another 29 pollutants.<sup>108</sup>

Regulation 194/05 Industry Emissions – Nitrogen Oxides and Sulphur Dioxide addresses the first two points of the five-point action plan. Further information is available at <http://www.ene.gov.on.ca/envision/AIR/regulations/industry.htm>. The other points have been addressed through Regulation 419/05 Air Pollution – Local Air Quality, available at <http://www.ene.gov.on.ca/envision/AIR/regulations/localquality.htm>.

The Ministry of the Environment has been revising its air quality standards since 1996.<sup>109</sup> A number of these revisions relate to increasing concerns in relation to air quality and health, and the impact of smog. Nitrogen oxide (NO<sub>x</sub>) is a significant contributor to poor air quality and a precursor to smog.

Regulation 346 (General Air Pollution) provides the legal authority for much of the work by the Ministry in relation to air quality. The tools they use to ensure an improvement in air quality over time in the industry, including wineries, are Certificates of Approval.

For wineries, the major sources of regulated air pollutants will be from boilers, emergency generators and the extraction of air from hoods in laboratories.

In Ontario, the MOE requires a Certificate of Approval to be obtained before the establishment of a new or newly modified Ontario boiler or heater that burns oil or gas fuel and is larger than 10 million Btu/h (10.5 GJ/h) (fuel energy input), with some minor exceptions.<sup>110</sup> A Btu is the British thermal unit: the amount of heat required to raise 1 lb of water through 1°F under specified conditions.<sup>111</sup>

The Ministry provides some sheets to assist in calculations. For example, the Combustion Equipment Data Sheet (available at <http://www.ene.gov.on.ca/envision/gp/4130e.pdf>) poses a series of questions, including: a brief description of the piece of combustion equipment being applied for – a boiler, heater, generator or the like; the rating of the equipment; the fuel being used; hours of operation for the proposed equipment and exhaust emission information, exhaust flowrate and temperature.<sup>112</sup>

Likewise, there are data sheets to be used before an emergency generator is to be installed.

If a Certificate of Approval has been obtained, you must make sure that the Certificate of Approval and all supporting documents are at the site where the boiler or heater is located, until the boiler or heater ceases operation.<sup>113</sup>



The Ministry refers to voluntary actions in support of energy efficiency and reduced emissions from boilers and heaters. While these actions are not currently mandatory, "...the Ministry strongly recommends that owners of combustion equipment pursue these activities to reduce operating costs and air emissions."<sup>114</sup> Information and assistance in these activities is available from the Environmental Partnerships Branch of the Ministry of the Environment.<sup>115</sup>

## Beyond the Rules

Air emissions from boilers and generators are a basic outcome of the need for energy and warmth. Look for opportunities to reduce the loading and energy needs.

It is always easiest to maximize efficiency at the design stage of a new or expanding facility. While there may be additional costs upfront, the mounting costs of energy make the business case for energy-efficient design increasingly attractive. In addition to decisions on design of the building, equipment selection can also provide opportunities for efficiencies that will save money for your organization.

Design criteria can include natural light maximization, passive energy principles, cogeneration opportunities and on-site electrical generation.

Light requirements in a facility can be a source of wasted energy. At any time that a company is looking to reduce its energy use, an audit of whether the most efficient and effective lighting has been designed and installed can be the first step to savings. Traditional light bulbs generate considerable waste energy that has to be offset in summer by additional cooling. Making provisions for energy-efficient lighting features, and using natural light through the siting of buildings, overhangs and light wells, can reduce energy and costs of operations.

In wineries, refrigeration, pumps, fans and drives are also significant, major consumers of energy. Attention to the appropriate design of this equipment can maximize the energy efficiencies and reduce overall loads.

Generating electricity on-site is also an option worth considering. Wind power, solar energy and geothermal energy are options that are being explored.

Further information on energy saving initiatives is available in *Sustainable Winemaking Ontario: Energy Best Practice for Wineries*.

---

## Flat Rock Cellars

**Flat Rock Cellars** uses a geothermal system to heat and cool all the tanks in the winery as well as the winery and retail store building. This has reduced hydro use by 70 per cent and lowered costs.



# **NOISE**

## **Wineries**

Inevitably, there will be noise generated from different parts of the operation. By far the best time to reduce the possibility of noise problems in the winery is at the design stage.

### **Machinery Noise**

External motor noise can lead to problems with neighbours. At the design stage, taking care to have the noisiest operations as distant from other uses as possible, particularly houses, can assist. In some cases the bulk of the winery itself can be used to shield neighbours and workers alike from undue noise.

Containing machinery inside the envelope of the building also helps reduce noise.

If you are receiving complaints about machinery or other noisy aspects of the winery operation, consider applying baffles or other techniques to reduce the impact of noise.

### **Vehicle Movement**

For some neighbours, the movement of trucks into and out of the property, the noise of vehicles reversing and the idling of vehicles, i.e., running the engine while the vehicle is not moving, can generate considerable nuisance. If this has not been addressed at the design stage, then you should try to ensure that operators reduce their impacts.

Consider, for example, restrictions on the times that vehicles are moving on the property – neither too late nor too early. This is obviously more difficult at vintage. It can be helpful to keep neighbours informed of what is going on and how long any unavoidable late traffic movement in Vintage is likely to last.

Idling of vehicles can be a very expensive habit in terms of wasted fuels. It also pollutes the environment and damages engines. If vehicles idle near your staff or the air intake of heating or cooling, this can also cause health issues for staff. There is a trend for municipalities to bring in by-laws banning idling of vehicles.

## Growers

An OMAFRA fact sheet, *Noise Control on Farms*,<sup>116</sup> provides a useful summary of noise control issues.

### Legal Aspects of Noise Control

*In Ontario, the law concerning noise goes back a number of years. Noise was originally treated as an inconvenience, nuisance, or interference with the use of property. In response to public concerns, municipal authorities became involved in addressing complaints and restraining the activities of noisemakers by developing and enforcing municipal by-laws to regulate or prohibit noise. In 1971, sound and vibration were defined as contaminants under the Environmental Protection Act (EPA). In 1974, the EPA was revised to empower local municipalities, subject to approval of the Ministry of the Environment (MOE), to pass by-laws regulating the emission of sound and vibration. The Model Noise Control By-law was developed by MOE to help municipalities pass noise by-laws and it is used as a guideline for MOE staff when conducting an assessment or investigation.*

*In 1988, the Farm Practices Protection Act, commonly called the "right to farm" legislation, was established to protect farmers who carry on normal farm practices from court action against odour, noise or dust complaints under common law of nuisance. If a noise resulting from a farm practice is in contravention of any Act or by-law such as a noise-control by-law, then the Farm Practices Protection Act would not apply.<sup>117</sup>*

### Wind Machines

If you decide to install a wind machine, try to minimize noise. Also, talk to the neighbours surrounding the winery so that they know how often you are likely to use it, and explain the risk to your business if you have frost damage.

Suggested installation is at least 500 feet away from a neighbour's house.<sup>118</sup>

In certain circumstances, MOE sets 70 dBA as the maximum at a point 100 feet away from a home. This is the noise of a loud conversation.<sup>119</sup>

Each wind machine is supposed to protect up to 10 acres of vineyard, which is a radius of 375 feet.<sup>120</sup>

Note that the suggested installation distance for wind machines is a guideline, not a rule, from OMAFRA.

## **Bird-Scaring Devices**

The MOE has a guideline for the use of acoustical bird-scaring devices in residential areas – specifically, where residential property is abutting the farm's property line.

One part of the guideline applies to bird-scaring devices operated within 100 metres of the farm's property line; the second is for devices beyond 100 metres of the property line.

Contact the MOE for more information and for a copy of the guideline, which is not currently available online.

OMAFRA has a fact sheet (Order 98-035) entitled *Bird Control on Grape and Tender Fruit Farms*.<sup>121</sup> It includes information on bird behaviour, bird repellent methods, factors to consider when determining which strategy to use, and a case study, including costs.

## Growing your business

The Wine Council of Ontario has produced a companion document, *A Newcomer's Primer: The environment and the wine industry in Ontario*. This document outlines the range of matters that need to be considered if you are interested in starting, purchasing or expanding a winery or vineyard. You will require the appropriate approvals from municipalities, and from all of the organizations outlined above. In some areas of Ontario, you may also need approvals from the Niagara Escarpment Commission.

### Niagara Escarpment – Additional Approvals

In addition to municipal and provincial approvals, you may also need approvals from the Niagara Escarpment Commission (NEC). The Niagara Escarpment, which stretches 725 kilometres from Queenston to Tobermory, has been identified as a World Biosphere Reserve.<sup>122</sup>

This location has its own legislation, the Niagara Escarpment Planning and Development Act, originally approved in 1973. The Act established the Niagara Escarpment Commission and also directed the preparation of the Niagara Escarpment Plan.

The website for the Niagara Escarpment Commission is at <http://www.escarpment.org>. Its offices are at 232 Guelph Street, Georgetown, Ontario, L7G 4B1 (905 877-5191); or at 99 King Street East, Thornbury, Ontario, N0H 2P0 (519 599-3340).

The purpose of the Niagara Escarpment Planning and Development Act is “to provide for the maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment and to ensure only such development occurs as is compatible with that natural environment.”<sup>123</sup> Copies of the Act are available at [http://www.escarpment.org/Publications/act\\_intro.htm](http://www.escarpment.org/Publications/act_intro.htm).

The Act provides that any “development” (a change in the use of any land, building or structure) requires a Development Permit unless such development is exempt under the regulations or unless the development complies with a Development Permit issued under the act. Ontario Regulation 828/90, as amended, outlines those uses that are exempt from requiring a Development Permit.

In 1986 the provincial government recognized the significance of the Niagara Escarpment by approving the first provincial plan to protect the Escarpment and “land in its vicinity.” Ontario Regulation 826/90 sets out the boundaries of the Development Control Area. Maps of the Niagara Escarpment Plan area and the designations are available at

[www.escarpment.org/Publications/plan\\_maps.htm](http://www.escarpment.org/Publications/plan_maps.htm). Niagara Escarpment Plan maps can also be obtained from the offices of the Niagara Escarpment Commission.

The Niagara Escarpment Plan is clearly geared to protecting the environment as its first goal, as it reflects the Act. This is different from municipal plans that seek to balance a range of needs. The designations of the Plan are made depending on the environmental sensitivity of the area and its relationship to the escarpment. The Plan outlines permitted uses and also Development Criteria that must be satisfied before a Development Permit can be issued.

The Plan document is available at [http://www.escarpment.org/Publications/plan\\_intro.htm](http://www.escarpment.org/Publications/plan_intro.htm).

If you wish to build or expand a winery or expand a vineyard, you should check the pamphlet "Do I need a Niagara Escarpment Permit?" at <http://www.escarpment.org/Publications/permitbooklet.htm> and speak to staff at the Niagara Escarpment Commission.

The most recent review of the Niagara Escarpment Plan specifically addressed the question of wineries as a permitted use. The changes as a result of that review added wineries as a separate permitted use in the Escarpment Protection Area and Escarpment Rural Area subject to very specific development criteria. The new Niagara Escarpment Plan was approved by Cabinet on June 1, 2005. The following outlines the main outcomes of the changes in 2005 in relation to wineries.

## **Highlights of Winery Development Policies Under the 2005 Niagara Escarpment Plan**

### **Winery Restaurants**

Winery restaurants, banquet halls and conference centres are not permitted. To quote:

*Small wine serving facilities with limited light meals service are permitted as an incidental use at Niagara Escarpment wineries to allow them to serve wine by the glass or bottle for consumption at wineries with limited food service without establishing large, full service destination restaurants.*

*The following conditions apply to the operation of these facilities:*

- *The winery is appropriately licensed under the Liquor License Act.*
- *Priority for sale is given to wine produced at that winery for sale for consumption.*

- *The type of food provided must not exceed "light meals". (5 different light courses, 4 additional snacks – all hot or cold. This is the same as the Alcohol and Gaming definition for light meals)*
- *The maximum seating capacity is 50 people.*
- *The incidental serving facility is located within the winery building, or on an attached deck or patio, and is considered to be part of the maximum allowable size of the winery.*
- *The facility operates only when the winery is open for public tours or public events.*
- *There shall be no inappropriate intensification of associated infrastructure such as extra parking or increased servicing requirements (water and sewer).*
- *The facility meets all relevant provincial and municipal requirements e.g., servicing, public health, etc.*
- *Limited food service is now defined in the NEP.<sup>124</sup>*

## **Winery Size and Development**

There are very specific controls now outlined for winery size and development. For example, the 2005 Niagara Escarpment Plan specifies that the maximum size of a winery is limited to 1.5 per cent of the size of the farm to a maximum of 25,000 sq. ft. with unlimited underground capacity. The full outline of the requirements for winery size and development can be seen in the NEC document "Summary of Changes in the 2005 Niagara Escarpment Plan" available at [http://www.escarpment.org/Publications/NEP.2005\\_Summary.of.changes.pdf](http://www.escarpment.org/Publications/NEP.2005_Summary.of.changes.pdf).

A full copy of the amended Niagara Escarpment Plan is available on the web at [http://www.escarpment.org/Publications/NEP\\_July\\_24\\_06.pdf](http://www.escarpment.org/Publications/NEP_July_24_06.pdf).

Application forms for Development Permits and Plan Amendments are available at Commission offices along with guidelines and fact sheets on procedures. The Commission advises that their "...staff make site inspections and are available to assist and advise applicants on Plan policies, review process, Commission decision and appeals process. Applicants may appear before the Commission to provide information about their applications. Commission staff make recommendations, but the decisions on Development Permits and Plan Amendments are made by the Commissioners as a corporate body."<sup>125</sup>

There is a Niagara Escarpment Commission staff person working part-time out of the Ministry of the Environment Building located in the Niagara District Office at 301 St. Paul Street, 9<sup>th</sup> Floor, St. Catharines, 905 704-3917 or 1 800 263-1035 ext. 43917.

All decisions of the Commission on permits or amendments may either be appealed to the Minister of Natural Resources or referred to a Hearing Officer.



## CONCLUSION

All businesses in Ontario, including wineries and grape growers, must meet a range of legislative requirements.

The wine industry has the advantage of being comparatively new, and able to draw on experiences in other parts of the world as it expands. Building and continuously expanding good environmental practice is a key element of a healthy, sustainable wine industry.

This document is one component of the proactive program that has been initiated by the Wine Council of Ontario: *Sustainable Winemaking Ontario: An Environmental Charter for the Wine Industry*. For further information on the program and its elements, please contact the Wine Council of Ontario at <http://www.winesofontario.org/>.

## APPENDIX ONE: IMPORTANT DATES

DATE	ACTION	COMMENT
January 1–15 February, any year	Must re-register as a generator of hazardous or industrial waste, if applicable.	
February 15, any year	Deadline for registration of hazardous or industrial waste.	<p>If not done in time, your registration number will expire and you will not be able to ship hazardous waste off-site until you are reregistered.</p> <p>Registration is available through the Hazardous Waste Information Network at <a href="http://www.ene.gov.on.ca">http://www.ene.gov.on.ca</a>.</p>
March 15, any year	Renew application for water for irrigation from Niagara-on-the-Lake.	Only for growers taking irrigation water in Niagara-on-the-Lake. Contact the municipality at 905 468-3278.
December 31, any year	Deadline to provide records of amount of water taken, if applicable.	If your enterprise has a permit to take water, then it should ensure that the appropriate records are being kept.

## APPENDIX TWO: REFERENCES

Canadian Food Inspection Agency, Chemical Residue Sampling Reports, available at <http://www.inspection.gc.ca/english/bureau/resid/reside.shtml>.

EastDell Estate, Niagara West Winery's Property Restoration Comes to Life, Summer 2004.

Enviro-Stewards Inc., Reducing Waste and Making Money A Concise and Practical Guide to Pollution Prevention in Wineries, Environment Canada, 2005.

Fisheries and Oceans Canada, Parks Canada, Government of Ontario, Conservation Ontario, What You Should Know about Fish Habitat, Brochure, October 2003, available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info_e.htm).

Fisheries and Oceans Canada, A Class Authorization System for Agricultural Municipal Drains in the Southern Ontario Region, Fact sheet L2, November 1999, available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/L2\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/L2_e.htm).

R. Frank., Pesticide Contamination of Farm Water Supplies: Recommendations on Avoidance, Cleanup and Responsibilities, Ontario Ministry of Agriculture, Food and Rural Affairs, Fact sheet Agdex #607 Order #00-099, December 2000, available at <http://www.omafra.gov.on.ca/english/crops/facts/00-099>.

R. Frank, Ontario Ministry of Agriculture, Food and Rural Affairs, Reducing Pesticide Drift and Crop Damage, Fact sheet Agdex #607, Order #88-118, available at <http://www.omafra.gov.on.ca/english/crops/facts/88-118.htm>.

Health Canada, Maximum Levels of Pesticides, available at <http://www.pmr-arla.gc.ca/english/legis/maxres-e.html>.

Hugh Fraser, "Are you thinking about installing a wind generator?" in The Tender Fruit Grape Vine, November/December 2003, Volume 8, Issue 2, page 9 and 10.

Hugh Fraser and Sid Vander Veen, Ontario Ministry of Agriculture, Food and Rural Affairs, Fact sheet, Top 10 Common Law Drainage Problems Between Rural Neighbours, Agdex #752, Order #98-015, available at <http://www.omafra.gov.on.ca/english/engineer/facts/98-015.htm>.

H.W. Fraser, H. Fisher and I. Frensch, Bird Control on Grape and Tender Fruit Farms, OMAFRA Fact sheet, Order No. 98 -035, June 1998, Agdex 685/730.

Ontario Ministry of Agriculture, Food and Rural Affairs, Compendium Nutrient Management Act 2001, available at <http://www.omafra.gov.on.ca/english/agops/compendium.pdf>.

Ontario Ministry of Agriculture, Food and Rural Affairs, Fruit Production Recommendations 2006-2007, Publication 360, 2006.

Ontario Ministry of Agriculture, Food and Rural Affairs, Noise Control on Farms, Order #96-033, available at <http://www.omafra.gov.on.ca/english/engineer/facts/96-033.htm>.

Ontario Ministry of Agriculture, Food and Rural Affairs, Nutrient Management Protocol Part 1 – Introduction, December 2003, available at <http://www.gov.on.ca/OMAFRA/english/nm/regs/nmpro/nmpro01.htm>.

Ontario Ministry of Agriculture, Food and Rural Affairs, On-Farm Winery A Resource Book for Ontario Producers, April 1996. Prepared in co-operation with: Ontario Grape Growers' Marketing Board; Wine Council of Ontario; The Liquor Control Board of Ontario; Ontario Ministry of Agriculture, Food and Rural Affairs; Regional Municipality of Niagara.

Ontario Ministry of Agriculture, Food and Rural Affairs, Pesticide – Handling Facility, Fact sheet Agdex #607, Order #94-037, page 1, available at <http://www.omafra.gov.on.ca/english/engineer/facts/94-037.htm>.

Ontario Ministry of Agriculture, Food and Rural Affairs, Precautions with Pesticides: Disposing of Pesticides and Empty Pesticide Containers, available at <http://www.omafra.gov.on.ca/english/crops/resource/1disposa.htm>.

Ontario Ministry of Agriculture, Food and Rural Affairs, Starting a Winery in Ontario, 2003, Publication 815.

Ontario Ministry of Environment and Energy, Protocol for the Utilization of Waste Fruits on Agricultural Lands, July 1994.

Ontario Ministry of the Environment, Combustion Equipment Data Sheet, undated, available at <http://www.ene.gov.on.ca/envision/gp/4130e.pdf>.

Ontario Ministry of the Environment, November 1999, Guide for Applying for Approval of Industrial Sewage Works – November 1999, available at <http://www.ene.gov.on.ca/envision/gp/3070e01.pdf>.

Ontario Ministry of the Environment, Guide for Applying for Approval of Permit to Take Water Section 34 Ontario Water Resources Act, RSO 1990. Interim Guide. Regional Operations, June 2000, edited April 2004, available at <http://www.ene.gov.on.ca/envision/gp/4468e.pdf>.

Ontario Ministry of the Environment, Guideline A-9 NOx Emissions from Boilers and Heaters, March 2001, available at <http://www.ene.gov.on.ca/envision/gp/A9.pdf>.

Ontario Ministry of the Environment, Ontario's Plan for Clean Air, available at <http://www.ene.gov.on.ca/envision/air/airquality/clap.htm>.

Ontario Ministry of the Environment, Supplying Safe Drinking Water A guide for owners and operators of small non-municipal non-residential drinking water systems that supply water to the public..., available at <http://www.ene.gov.on.ca/envision/gp/5117e.pdf>.

Ontario Ministry of the Environment, Supplying Safe Drinking Water A guide for owners and operators of non-municipal seasonal residential drinking water systems that do not serve designated facilities, available at <http://www.ene.gov.on.ca/envision/gp/5119e.pdf>.

Ontario Ministry of the Environment, Technical Update for Municipal Residential Drinking Water Systems under O. Reg. 170/03, available at <http://www.ene.gov.on.ca/envisions/gp/4478e16.pdf>.

Ontario Ministry of the Environment, Treatment Options for owners of non-municipal year round residential drinking water systems, available at <http://www.ene.gov.on.ca/envision/gp/5477e.pdf>.

Ontario *Safe Drinking Water Act*, 2002 – O. Reg. 170/03, S. 7(4), available at [http://www.e-laws.gov.on.ca/dblaws/regs/english/030170\\_e.htm](http://www.e-laws.gov.on.ca/dblaws/regs/english/030170_e.htm).

Ken Slingerland, “Do I need a Permit to Take Water?” in The Tender Fruit Grape Vine, November/December 2003, Volume 8, Issue 2, page 5.

R.P. Stone, Pesticide – Handling Facility, Fact sheet Agdex #607, Order #94-037, Ministry of Agriculture and Food, February 1994, available at <http://www.omafra.gov.on.ca/english/engineer/facts/94-037.htm>.

Michael Toombs, Noise Control on Farms, Ministry of Agriculture and Food, Fact sheet, Order # 96-033, February 1996, AGDEX 700, available at <http://www.omafra.gov.on.ca/english/engineer/facts/96-033.htm>.

S. Vander Veen, So What is a Municipal Drain?, Ministry of Agriculture and Food, Fact sheet #752, Order #01-059, available at <http://www.omafra.gov.on.ca/english/engineer/facts/01-059.htm>.

S. Vander Veen, Agricultural Drainage Licensing, Ministry of Agriculture and Food, Fact Sheet #752, Order #01-063, available at <http://www.omafra.gov.on.ca/english/engineer/facts/01-063.htm>.

## APPENDIX THREE: OTHER SOURCES OF INFORMATION

### **Fact Sheets and Other Web Information:**

#### **Permit to Take Water**

*Ministry of the Environment*

Permits to Take Water information page (web page index). Available at <http://www.ene.gov.on.ca/envision/water/pttw.htm>.

Application for Permit to Take Water April 2005. Available at <http://www.ene.gov.on.ca/envision/gp/5046e02.pdf>.

Green Facts Permit to Take Water October 2005. Available at <http://www.ene.gov.on.ca/programs/5299e.pdf>.

Guide to Permit to Taking Water Application Form. Sections 34 and 98 Ontario Water Resources Act R.S.O. 1990 and Water Taking and Transfer Regulation 387/04 February 2006. Available at <http://www.ene.gov.on.ca/envision/gp/5046e.pdf>.

#### **Drinking Water**

*Ministry of the Environment*

Technical Update for Municipal Residential Drinking Water Systems under O. Reg. 170/03. Available at <http://www.ene.gov.on.ca/envisions/gp/4478e16.pdf>.

Supplying Safe Drinking Water: A guide for owners and operators of non-municipal seasonal residential drinking water systems that do not serve designated facilities. Available at <http://www.ene.gov.on.ca/envision/gp/5119e.pdf>.

Supplying Safe Drinking Water: A guide for owners and operators of small non-municipal non-residential drinking water systems that supply water to the public... Available at <http://www.ene.gov.on.ca/envision/gp/5117e.pdf>.

Treatment Options for owners of non-municipal year round residential drinking water systems. Available at <http://www.ene.gov.on.ca/envision/gp/5477e.pdf>.

#### **Drinking Water Treatment Service Providers**

The Ministry of the Environment provides a list of businesses that provide products and/or services related to drinking water treatment. "The list is provided as a means for owners of private communal works, small systems, and individual private supplies to facilitate comparison shopping. Water treatment equipment may also be provided by local hardware stores, co-operatives, and building supply centres in your area." The list is available at <http://www.ene.gov.on.ca/envision/gp/5677e.htm>.

## **Wastewater**

*Ministry of the Environment*

Application for Approval of Industrial Sewage Works available at <http://www.ene.gov.on.ca/envision/gp/3070e03.pdf>.

Green Facts: Certificates of Approval – Industrial Sewage Works, April 2005. Available at <http://www.ene.gov.on.ca/envision/gp/4980e.pdf>.

Guide for Applying for Approval of Industrial Sewage Works, Section 53 Ontario Water Resources, November 1999. Available at <http://www.ene.gov.on.ca/envision/gp/3070e01.pdf>.

## **Nutrient Management**

*Ministry of Agriculture, Food and Rural Affairs*

Ministry of Agriculture, Food and Rural Affairs, Compendium Nutrient Management Act 2001. Available at <http://www.omafr.gov.on.ca/english/agops/compendium.pdf>.

Ministry of Agriculture and Food, Nutrient Management Protocol Part 1 – Introduction, December 2003 available at <http://www.omafr.gov.on.ca/english/nm/regs/nmpro/nmpro01.htm>.

## **Drains**

*Fisheries and Oceans Canada*

Cliff Evanitski, The Drain Primer: Guide to Maintaining and Conserving Agricultural Drains and Fish Habitat, (undated). Available at [http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelines-conseils/guides/drain-primer/fpd/fullprintable\\_fpd\\_e.asp](http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelines-conseils/guides/drain-primer/fpd/fullprintable_fpd_e.asp).

Fisheries and Oceans Canada, Conservation Ontario, Working Around Water? A Class Authorization System for Agricultural Municipal Drains in the Southern Ontario Region, (brochure). August 1999.

*Ministry of Agriculture, Food and Rural Affairs*

R.A. Cline, Soil Management for Orchards and Vineyards, Fact sheet Agdex #206/510 Order #92 – 120, May 1992. Available at <http://www.omafr.gov.on.ca/english/crops/facts/92-120.htm>.

Hugh Fraser and Sid Vander Veen, Ontario Ministry of Agriculture, Food and Rural Affairs, Fact sheet Top 10 Common Law Drainage Problems Between Rural Neighbours, Agdex #752, Order #98-015. Available at <http://www.omafr.gov.on.ca/english/engineer/facts/98-015.htm>.

R.W. Irwin, Maintenance of the Drainage System, Fact sheet Agdex #553, Order #87-062, October 1987. Available at <http://www.omafr.gov.on.ca/english/engineer/facts/87-062.htm>.

S. Vander Veen, So, What's a Municipal Drain? Fact sheet #752, Order #01 – 059, August 2001. Available at <http://www.omafr.gov.on.ca/english/engineer/facts/01-059.htm>.

S. Van Vander Veen, Agricultural Drainage Licensing Fact sheet #752, Order #01-063, April 1998. Available at <http://www.omafra.gov.on.ca/english/engineer/facts/01-063.htm>.

### **Watersheds, Watercourses and Water Quality**

Fisheries and Oceans Canada, A Class Authorization System for Agricultural Municipal Drains in the Southern Ontario Region, Fact Sheet L2, November 1999. Available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/L2\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/L2_e.htm).

Fisheries and Oceans Canada, Fish Habitat and the Effect of Silt and Sediment, Fact Sheet T1, October 2003. Available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/t1\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/t1_e.htm).

Fisheries and Oceans Canada, Parks Canada, Government of Ontario and Conservation Ontario, What You Should Know About Fish Habitat, Brochure, October 2003. Available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info_e.htm).

Ministry of the Environment, Ontario, White Paper on Watershed-Based Source Protection Planning, February 2004. Available at <http://www.ene.gov.on.ca/programs/3585e01.pdf>.

Ministry of Environment , Ontario Proposed Drinking Water Source Protection Act. Available at <http://www.ene.gov.on.ca/envregistry/023184ea.htm>.

Niagara Peninsular Conservation Authority, Buffers are better Water Quality Improvement Program, Brochure, October 2003. Available at <http://www.conservation-niagara.on.ca/pdf/buffers.pdf>.

Niagara Peninsular Conservation Authority, Water Quality Improvement Program, Brochure, May 2003.

Niagara Peninsular Conservation Authority, Backyard Naturalization Water Quality Improvement Program, Brochure, October 2003. Available at [http://www.conservation-niagara.on.ca/pdf/Naturalization\\_brochure\\_final.pdf](http://www.conservation-niagara.on.ca/pdf/Naturalization_brochure_final.pdf).

Niagara Peninsular Conservation Authority, Wetlands are Worth It Water Quality Improvement Program, October 2003. Available at [http://www.conservation-niagara.on.ca/pdf/Wetland\\_Brochure\\_final.pdf](http://www.conservation-niagara.on.ca/pdf/Wetland_Brochure_final.pdf).

Pollution Probe, The Source Water Protection Primer, May 2004. Available at <http://www.pollutionprobe.org/Reports/swpprimer.pdf>.

### **Waste Management**

*Ministry of the Environment*

Ministry of the Environment, Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste, December 2001. Available at [http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2000/RA00E0002.htm](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/RA00E0002.htm).



Ministry of the Environment, Septic Systems and Hauled Sewage Regulation Changes. Available at [http://www.ene.gov.on.ca/envision/water/septic/septic\\_changes.htm](http://www.ene.gov.on.ca/envision/water/septic/septic_changes.htm).

## **Pest and Pesticide Management**

*Canadian Food Inspection Agency*

Canadian Food Inspection Agency, Chemical Residue Sampling Reports. Available at <http://www.inspection.gc.ca/english/bureau/resid/reside.shtml>.

*Ministry of Agriculture, Food and Rural Affairs*

N. Carter and H. Fraser, Mating Disruption for Management of Insect Pests, Fact sheet Agdex #621 Order #03-079. September 2003.

N. Carter, K. Ker, W. McFadden-Smith, Insect and Disease Identification Guide for Grapes, Fact sheet Agdex #231/600 Order #03-039. May 2003.

R. Frank, Pesticide Contamination of Farm Water Supplies: Recommendations on Avoidance, Cleanup and Responsibilities, Ministry of Agriculture and Food, Fact sheet Agdex #607 Order #00-099, December 2000. Available at <http://www.omafr.gov.on.ca/english/crops/facts/00-099.htm>.

R. Frank, Ontario Ministry of Agriculture, Food and Rural Affairs, Reducing Pesticide Drift and Crop Damage, Fact sheet Agdex #607, Order #88-118. Available at <http://www.omafr.gov.on.ca/english/crops/facts/88-118.htm>.

Leslie Huffman, *Top 10 Things to Do about Weeds in your Orchard/Vineyard This Fall* in Hort Matters, Volume 4, Issue 26 September 22, 2004. Page 9.

Ontario Ministry of Agriculture, Food and Rural Affairs, Fruit Production Recommendations 2006-2007, Publication 360, 2006.

Ontario Ministry of Agriculture, Food and Rural Affairs, Publication 75: Guideline to Weed Control, 2006-2007. Available at <http://www.omafr.gov.on.ca/english/crops/pub75/pub75toc.htm>.

Ontario Ministry of Agriculture, Food and Rural Affairs, Precautions with Pesticides: Disposing of Pesticides and Empty Pesticide Containers. Available at <http://www.omafr.gov.on.ca/english/crops/resource/1disposa.htm>.

OMAF and Agriculture and AgriFood Canada Best Management Practices booklet, Pesticide Storage, Handling and Application. Available at <http://www.omafr.gov.on.ca/english/environment/pesticide/psa.htm>.

Helmut Spieser, Ways to Avoid Pesticide Spills, Fact sheet Agdex #730/607, Order #96-025. 1996. Available at <http://www.omafr.gov.on.ca/english/engineer/facts/96-025.htm>.

R.P Stone, Pesticide – Handling Facility Fact sheet Agdex #607, Order #94-037. February 1994. Available at <http://www.omafra.gov.on.ca/english/engineer/facts/94-0307.htm>.

#### *Health Canada*

Health Canada, Questions and answers about the proposed new Pest Control Products Act. Available at [http://www.hc-sc.gc.ca/english/media/releases/2002/2002\\_17bk3.htm](http://www.hc-sc.gc.ca/english/media/releases/2002/2002_17bk3.htm) March 2002.

Health Canada, A comparison of the proposed and existing Pest Control Products Acts. Available at [http://www.hc-sc.gc.ca/english/media/releases/2002/2002\\_17bk2.htm](http://www.hc-sc.gc.ca/english/media/releases/2002/2002_17bk2.htm) March 2002.

Health Canada, Fact Sheet on Pesticides and Food, available at [http://www.pmr-arla.gc.ca/english/pdf/fact/fs\\_food-e.pdf](http://www.pmr-arla.gc.ca/english/pdf/fact/fs_food-e.pdf) 1999.

### **Air Emissions**

Narelle Martin, Sustainable Winemaking Ontario: Energy Best Practice for Wineries, Wine Council of Ontario, 2006.

#### *Ministry of the Environment*

Ministry of the Environment, Application for Approval (Air and Noise), May 2002 (updated August 2004). Available at <http://www.ene.gov.on.ca/envision/gp/4173e.pdf>.

Ministry of the Environment, Fact Sheet, Basic Comprehensive Certificates of Approval (Air), April 2002. Available at <http://www.ene.gov.on.ca/envision/gp/4392e.pdf>.

Ministry of the Environment, Basic Comprehensive Certificates of Approval (Air) User Guide Version 2.0, April 2004. Available at <http://www.ene.gov.on.ca/envision/gp/4391e.pdf>.

Ministry of the Environment, Combustion Equipment Data Sheet, (undated). Available at <http://www.ene.gov.on.ca/envision/gp/4130e.pdf>.

Ministry of the Environment, Emergency Generator Data Sheet, (undated). Available at <http://www.ene.gov.on.ca/envision/gp/4131e.pdf>.

Ministry of the Environment, Guideline A9 NOx emissions from Boilers and Heaters, March 2001. Available at <http://www.ene.gov.on.ca/envision/gp/A9.pdf>.

### **Noise Control**

Hugh Fraser, *Are you thinking about installing a wind generator?* in The Tender Fruit Grape Vine, November/December 2003, Volume 8, Issue 2, page 9 and 10.

H.W. Fraser, H. Fisher and I. Frensch, Bird Control on Grape and Tender Fruit Farms, OMAFRA Fact Sheet, Order #98 -035, June 1998, Agdex 685/730.

Michael Toombs, Noise Control on Farms, Ontario Ministry of Agriculture, Food and Rural Affairs, Fact Sheet. Order #96-033 February 1996. Agdex 700. <http://www.omafra.gov.on.ca/english/engineer/facts/96-033.htm>

### **Niagara Escarpment Commission**

Niagara Escarpment Plan

[http://www.escarpment.org/pdfandword\\_files/nep.pdf](http://www.escarpment.org/pdfandword_files/nep.pdf)

Niagara Escarpment Act

[http://www.escarpment.org/pdfandword\\_files/nepda.pdf](http://www.escarpment.org/pdfandword_files/nepda.pdf)

Ontario Regulations 828/90

[http://www.escarpment.org/Publications/regulations\\_intro.htm](http://www.escarpment.org/Publications/regulations_intro.htm)

Niagara Escarpment Plan Maps

[http://www.escarpment.org/Publications/plan\\_maps.htm](http://www.escarpment.org/Publications/plan_maps.htm)

Niagara Escarpment Commission's Recommended Niagara Escarpment Plan (November 2001)

[http://www.escarpment.org/Review/Nov15NEP\\_recommended.pdf](http://www.escarpment.org/Review/Nov15NEP_recommended.pdf)

Do I need a Niagara Escarpment Permit?

<http://www.escarpment.org/Publications/permitbooklet.htm>

## ENDNOTES

- <sup>1</sup> Source: Ken Slingerland, *Do I need a Permit to Take Water?* in The Tender Fruit Grape Vine, November/December 2003, Volume 8, Issue 2, page 5.
- <sup>2</sup> Source: Ken Slingerland, *Do I need a Permit to Take Water?* in The Tender Fruit Grape Vine, November/December 2003, Volume 8, Issue 2, page 5.
- <sup>3</sup> Source: Pamela Lee, Ministry of the Environment, pers. comment., September 24, 2004.
- <sup>4</sup> Ministry of Environment, Green Facts Permit to Take Water, October 2005. Available at <http://www.ene.gov.on.ca/programs/5399e.pdf>, page 1.
- <sup>5</sup> Ministry of the Environment, Guide for applying for approval permit to take water. Section 34 Ontario Water Resources Act R.S.O. 1990 Interim Guide. Regional Operations, June 2000, edited April 2004. At <http://www.ene.gov.on.ca/envision/gp/44468e.pdf> cited 23 September 2004, page 2.
- <sup>6</sup> Ministry of the Environment, Guide for applying for approval permit to take water, page 2.
- <sup>7</sup> This system was established through a private Members Bill in 1988 – Bill PR88.
- <sup>8</sup> Advice on drinking water requirements was kindly provided by Mr. Mark Smithson, Supervisor, Ministry of the Environment, Safe Drinking Water Branch, West Central Region, July 14, 2006.
- <sup>9</sup> Ministry of the Environment, Technical Update for Municipal Residential Drinking Water Systems under O. Reg. 170/03, available at <http://www.ene.gov.on.ca/envisions/gp/4478e16.pdf>.
- <sup>10</sup> Ministry of Environment, Technical Update for Municipal Residential Drinking Water Systems under O. Reg. 170/03, available at <http://www.ene.gov.on.ca/envisions/gp/4478e16.pdf>.
- <sup>11</sup> Ministry of the Environment, Supplying Safe Drinking Water A guide for owners and operators of small non-municipal non-residential drinking water systems that supply water to the public..., available at <http://www.ene.gov.on.ca/envision/gp/5117e.pdf>.
- <sup>12</sup> Ministry of the Environment, December 2004, Drinking Water Information, page 1.
- <sup>13</sup> Advice from Mr. Mark Smithson, Ministry of the Environment, June 14, 2006.
- <sup>14</sup> Ministry of the Environment, Supplying Safe Drinking Water A guide for owners and operators of small non-municipal non-residential drinking water systems that supply water to the public..., available at <http://www.ene.gov.on.ca/envision/gp/5117e.pdf>, page 3.
- <sup>15</sup> Ministry of the Environment, Supplying Safe Drinking Water A guide for owners and operators of non-municipal seasonal residential drinking water systems that do not serve designated facilities, available at <http://www.ene.gov.on.ca/envision/gp/5119e.pdf>, page 2.
- <sup>16</sup> Ministry of the Environment, Treatment Options for owners of non-municipal year round residential drinking water systems, available at <http://www.ene.gov.on.ca/envision/gp/5477e.pdf>, page 1.
- <sup>17</sup> Ministry of the Environment, Supplying Safe Drinking Water A guide for owners and operators of small non-municipal non-residential drinking water systems that supply water to the public..., available at <http://www.ene.gov.on.ca/envision/gp/5117e.pdf>, page 3.
- <sup>18</sup> Ministry of the Environment, Supplying Safe Drinking Water A guide for owners and operators of small non-municipal non-residential drinking water systems that supply water to the public..., available at <http://www.ene.gov.on.ca/envision/gp/5117e.pdf>, pages 4-8.
- <sup>19</sup> Ministry of the Environment, November 1999, Guide for Applying for Approval of Industrial Sewage Works – November 1999. Appendix A Approvals legislation overview. Page A1.
- <sup>20</sup> This section is derived from Ministry of the Environment, November 1999, Guide for Applying for Approval of Industrial Sewage Works – November 1999. Appendix A Approvals legislation overview. Pages A3-A4.
- <sup>21</sup> Ministry of the Environment, November 1999, Guide for Applying for Approval of Industrial Sewage Works – November 1999. Appendix A Approvals legislation overview. Pages A4-A5.

- 
- <sup>22</sup> Ministry of the Environment, November 1999, Guide for Applying for Approval of Industrial Sewage Works – November 1999. Appendix A Approvals legislation overview. Page A5.
- <sup>23</sup> Ministry of the Environment, Guide for Applying for Approval of Industrial Sewage Works, Section 53 Ontario Water Resources, November 1999. Available at <http://www.ene.gov.on.ca/envision/gp/3070e01.pdf>.
- <sup>24</sup> Ministry of the Environment, Guide for Applying for Approval of Industrial Sewage Works, Section 53 Ontario Water Resources, November 1999. Pages 1-9.
- <sup>25</sup> Ministry of the Environment, Guide for Applying for Approval of Industrial Sewage Works, Section 53 Ontario Water Resources, November 1999. Page 1.
- <sup>26</sup> Ministry of the Environment, Guide for Applying for Approval of Industrial Sewage Works, Section 53 Ontario Water Resources, November 1999. Pages 2-3.
- <sup>27</sup> The Regional Municipality of Niagara – Part VIII of the Ontario Building Code at [http://www.regional.niagara.on.ca/living/health\\_wellness/healthy-enviro/ontario\\_building\\_code.aspx](http://www.regional.niagara.on.ca/living/health_wellness/healthy-enviro/ontario_building_code.aspx). Viewed September 29, 2004.
- <sup>28</sup> The Regional Municipality of Niagara – Part VIII of the Ontario Building Code at [http://www.regional.niagara.on.ca/living/health\\_wellness/healthy-enviro/ontario\\_building\\_code.aspx](http://www.regional.niagara.on.ca/living/health_wellness/healthy-enviro/ontario_building_code.aspx). Viewed September 29, 2004.
- <sup>29</sup> Ministry of the Environment, Septic Systems and Hauled Sewage Regulation Changes. Available at [http://www.ene.gov.on.ca/envision/Water/Septic/Septic\\_Changes.Htm](http://www.ene.gov.on.ca/envision/Water/Septic/Septic_Changes.Htm).
- <sup>30</sup> Letter from Mr. Rich Vickers, District Manager (Acting), Niagara District Office, MOE, February 17, 2005. Page 2.
- <sup>31</sup> Letter from Mr. Rich Vickers, District Manager (Acting), Niagara District Office, MOE, February 17, 2005. Page 2.
- <sup>32</sup> Letter from Mr. Rich Vickers, District Manager (Acting), Niagara District Office, MOE, February 17, 2005. Page 2.
- <sup>33</sup> Letter from Mr. Rich Vickers, District Manager (Acting), Niagara District Office, MOE, February 17, 2005. Page 2.
- <sup>34</sup> S. Vander Veen, Ministry of Agriculture and Food, So, What's A Municipal Drain? Fact sheet #752 Order #01 – 059. Available at <http://www.omafr.gov.on.ca/english/engineer/facts/01-059.htm>.
- <sup>35</sup> S. Vander Veen, Ministry of Agriculture and Food, So, What's A Municipal Drain? Fact sheet #752 Order #01 – 059. Available at <http://www.omafr.gov.on.ca/english/engineer/facts/01-059.htm>. Pages 2 and 3.
- <sup>36</sup> S. Vander Veen, Ministry of Agriculture and Food, So, What's A Municipal Drain? Fact sheet #752 Order #01 – 059. Available at <http://www.omafr.gov.on.ca/english/engineer/facts/01-059.htm>. Page 3.
- <sup>37</sup> Henri Bennemeer, January 10, 2005, Irrigation/Drainage Superintendent, Niagara-on-the-Lake.
- <sup>38</sup> S. Vander Veen, Ministry of Agriculture and Food, So, What's A Municipal Drain? Fact sheet #752 Order #01 – 059. Available at <http://www.omafr.gov.on.ca/english/engineer/facts/01-059.htm>. Page 3.
- <sup>39</sup> Linda Gabriele, Ministry of the Environment, pers. comment November 19, 2004.
- <sup>40</sup> S. Vander Veen, Ministry of Agriculture and Food, Agricultural Drainage Licensing, Fact sheet #752 Order #01-063. Available at <http://www.omafr.gov.on.ca/english/engineer/facts/01-063.htm>.
- <sup>41</sup> Henri Bennemeer, January 10, 2005, Irrigation/Drainage Superintendent, Niagara-on-the-Lake.
- <sup>42</sup> Ontario Ministry of Agriculture and Food Fact sheet Top 10 Common Law Drainage Problems Between Rural Neighbours, Agdex #752, Order #98-015. Available at <http://www.omafr.gov.on.ca/english/engineer/facts/98-015.htm>.
- <sup>43</sup> Fisheries and Oceans Canada, The Drain Primer: Guide to Maintaining and Conserving Agricultural Drains and Fish Habitat. Available at <http://www.dfo-mpo.gc.ca/canwaters->

---

[eauxcan/infocentre/guidelines-conseils/guides/drain-primer/fpd/fullprintable\\_fpd\\_e.asp](http://eauxcan/infocentre/guidelines-conseils/guides/drain-primer/fpd/fullprintable_fpd_e.asp). Cited October 4, 2004. Page 6.

<sup>44</sup> Fisheries and Oceans Canada, The Drain Primer: Guide to Maintaining and conserving Agricultural Drains and Fish Habitat. Available at [http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelines-conseils/guides/drain-primer/fpd/fullprintable\\_fpd\\_e.asp](http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelines-conseils/guides/drain-primer/fpd/fullprintable_fpd_e.asp). Cited October 4, 2004. Page 6.

<sup>45</sup> Fisheries and Oceans Canada, The Drain Primer: Guide to Maintaining and conserving Agricultural Drains and Fish Habitat. Available at [http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelines-conseils/guides/drain-primer/fpd/fullprintable\\_fpd\\_e.asp](http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelines-conseils/guides/drain-primer/fpd/fullprintable_fpd_e.asp). Cited October 4, 2004. Page 7.

<sup>46</sup> Fisheries and Oceans Canada, A Classification Authorization System for Agricultural Municipal Drains in the Southern Ontario Region, Fact sheet L2. Nov 1999. Available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/L2\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/L2_e.htm). Cited April 29, 2005.

<sup>47</sup> Advice from Mr. Ken Whitebread, Manager, Niagara Escarpment Commission, in letter dated February 9, 2005.

<sup>48</sup> Niagara Peninsular Conservation Authority, Land Use Planning. Available at <http://www.conservation-niagara.on.ca/planserv.htm>. Cited April 27, 2005.

<sup>49</sup> Fisheries and Oceans Canada, Parks Canada, Government of Ontario, Conservation Ontario, What You Should Know about Fish Habitat, brochure. Page 1. Available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info_e.htm).

<sup>50</sup> Letter from Suzanne McInnes, Watershed planning Co-ordinator, Niagara Peninsular Conservation Authority, April 26, 2005. Page 2.

<sup>51</sup> Fisheries and Oceans Canada, Parks Canada, Government of Ontario, Conservation Ontario, What You Should Know about Fish Habitat, brochure. Page 3. Available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info_e.htm).

<sup>52</sup> Fisheries and Oceans Canada, Parks Canada, Government of Ontario, Conservation Ontario, What You Should Know about Fish Habitat, brochure. Page 4. Available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info_e.htm).

<sup>53</sup> Fisheries and Oceans Canada, Parks Canada, Government of Ontario, Conservation Ontario, What You Should Know about Fish Habitat, brochure. Page 4. Available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info_e.htm).

<sup>54</sup> Fisheries and Oceans Canada, Parks Canada, Government of Ontario, Conservation Ontario, What You Should Know about Fish Habitat, brochure. Page 3. Available at [http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info\\_e.htm](http://www.dfo-mpo.gc.ca/regions/central/pub/fact-fait/info_e.htm).

<sup>55</sup> Letter from Suzanne McInnes, Watershed planning Co-ordinator, Niagara Peninsular Conservation Authority, 26 April 2005. Page 2.

<sup>56</sup> Letter from Suzanne McInnes, Watershed planning Co-ordinator, Niagara Peninsular Conservation Authority, 26 April 2005. Page 2.

<sup>57</sup> Letter from Suzanne McInnes, Watershed planning Co-ordinator, Niagara Peninsular Conservation Authority, 26 April 2005. Page 1.

<sup>58</sup> Ministry of the Environment and Energy, Protocol for the Utilization of Waste Fruits on Agricultural Lands, July 1994.

<sup>59</sup> Ministry of Environment and Energy, Protocol for the Utilization of Waste Fruits on Agricultural Lands, July 1994. Page 1.

<sup>60</sup> Ministry of the Environment and Energy, Protocol for the Utilization of Waste Fruits on Agricultural Lands, July 1994. Page 2.

<sup>61</sup> Mr. R. Vickers, Ministry of the Environment, personal comment, Friday 10 August, 2004.



---

<sup>62</sup> Ministry of the Environment and Energy, Protocol for the Utilization of Waste Fruits on Agricultural Lands, July 1994. Pages 2, 3, 4.

<sup>63</sup> Linda Gabriele, MOE, pers. comment. November 19, 2004.

<sup>64</sup> Ministry of the Environment, Hazardous Waste available at <http://www.ene.gov.on.ca/envision/land/hazardousWaste.htm>. Cited January 12, 2005.

<sup>65</sup> Ministry of the Environment, Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste, December 2001. Available at [http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2000/RA00E0002.htm](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/RA00E0002.htm), cited August 16, 2004. Page 1.

<sup>66</sup> Ministry of Environment, Three Step Registration Process. Available at [http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2000/ra00e0002d-3-step.pdf](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/ra00e0002d-3-step.pdf). Page 14.

<sup>67</sup> Ministry of the Environment, Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste, December 2001. Available at [http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2000/RA00E0002.htm](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/RA00E0002.htm), cited August 16, 2004. Page 23.

<sup>68</sup> Ministry of the Environment, Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste, December 2001. Available at [http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2000/RA00E0002.htm](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/RA00E0002.htm), cited August 16, 2004.

<sup>69</sup> Ministry of the Environment, Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste, December 2001. Available at [http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2000/RA00E0002.htm](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/RA00E0002.htm), cited August 16, 2004. Page i.

<sup>70</sup> "Subject Wastes" are defined in the guidelines: "Subject Wastes are Hazardous Wastes and Liquid Industrial Wastes which are subject to generator registration guidelines." Page 2.

<sup>71</sup> Ministry of the Environment, Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste, December 2001. Available at [http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2000/RA00E0002.htm](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/RA00E0002.htm), cited August 16, 2004. Page 4.

<sup>72</sup> Ministry of the Environment, *ibid.* Page 27.

<sup>73</sup> Ministry of the Environment, 2001, *Op. Cit.* Page 28.

<sup>74</sup> Ministry of the Environment, *op.cit.* Page 23.

<sup>75</sup> Ministry of the Environment, *op.cit.* Page 23.

<sup>76</sup> Ministry of the Environment, *op.cit.* Page 6.

<sup>77</sup> Ministry of the Environment, *op.cit.* Page 9.

<sup>78</sup> Ministry of the Environment, *op.cit.* Page 18.

<sup>79</sup> Linda Gabriele, MOE., Pers. comment, November 19, 2004.

<sup>80</sup> Ministry of the Environment, *op.cit.* Page 27.

<sup>81</sup> Ministry of the Environment, *op.cit.* Page 27.

<sup>82</sup> Explanatory note for the *Nutrient Management Act*. Available at <http://www.ontla.on.ca/library/bills/81373.htm>.

<sup>83</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Compendium Nutrient Management Act 2001. Available at <http://www.omafra.gov.on.ca/english/agops/compendium.pdf>. Page 2.

<sup>84</sup> Ontario Ministry of Agriculture and Food, Nutrient Management Protocol Part 1 – Introduction, December 2003. Available at <http://www.omafra.gov.on.ca/english/nm/regs/nmpro/nmpro01.htm>.

<sup>85</sup> From Health Canada website at [http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/2002/2002\\_84\\_e.html](http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/2002/2002_84_e.html).

<sup>86</sup> From Health Canada website at [http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/2002/2002\\_84\\_e.html](http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/2002/2002_84_e.html).

- 
- <sup>87</sup> Health Canada, Maximum Levels of Pesticides at <http://www.pmra-arla.gc.ca/english/legis/maxres-e.html>.
- <sup>88</sup> Canadian Food Inspection Agency, Chemical Residue Sampling Reports. Available at <http://www.inspection.gc.ca/english/bureau/resid/reside.shtml>.
- <sup>89</sup> Neil Carter, Ontario Ministry of Agriculture, Food and Rural Affairs, Pers. comment. March 21, 2005.
- <sup>90</sup> Ken Slingerland, Ontario Ministry of Agriculture and Food, Pers. Comment. October 6, 2004.
- <sup>91</sup> Dr. G. Soleas, Vice President Quality Assurance, LCBO. Pers. comments. January 13, 2004.
- <sup>92</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Fruit Production Recommendations 2006-2007, Publication 360, front cover.
- <sup>93</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Fruit Production Recommendations 2006-2007, Publication 360, 2006.
- <sup>94</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Publication 75: Guideline to Weed Control 2006-2007. Available at <http://www.omafra.gov.on.ca/english/crops/pub75/p75toc15.htm>.
- <sup>95</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Fruit Production Recommendations 2006-2007, Publication 360, Chapter 1. Pages 1–12.
- <sup>96</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Fruit Production Recommendations 2006-2007, Publication 360, Chapter 2. Pages 13–23.
- <sup>97</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Fruit Production Recommendations 2006-2007, Publication 360, Chapter 4. Page 47.
- <sup>98</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Fruit Production Recommendations 2006-2007, Publication 360, Chapter 9. Pages 189-208.
- <sup>99</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Pesticide – Handling Facility, Fact sheet Agdex #607, Order #94-037. Pages 2 and 3.
- <sup>100</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Pesticide – Handling Facility, Fact sheet Agdex #607, Order #94-037, page 1. Available at <http://www.omafra.gov.on.ca/english/engineer/facts/94-037.htm>.
- <sup>101</sup> Ministry of Agriculture and Food, Pesticide Container Rinsing, Fact sheet Agdex #607, Order #87-057. Page 1.
- <sup>102</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Precautions with pesticides: Disposing of Pesticides and Empty Pesticide Containers. Available at <http://www.omafra.gov.on.ca/english/crops/resource/1disposa.htm>.
- <sup>103</sup> R. Frank, Ontario Ministry of Agriculture, Food and Rural Affairs, Reducing Pesticide Drift and Crop Damage, Fact sheet Agdex #607, Order #88-118. Available at <http://www.omafra.gov.on.ca/english/crops/facts/88-118.htm>. Page 6.
- <sup>104</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Publication 75: Guide to Weed Control 2006-2007, Chapter 3 - *Precautions with Pesticides*, page 23 and 24. Also available at <http://www.omafra.gov.on.ca/english/crops/pub75/pub75toc.htm>.
- <sup>105</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Pesticide Contamination of Farm Water Supplies: Recommendations on Avoidance, Cleanup and Responsibilities, Fact sheet Agdex #607 Order #00-099. Available at <http://www.omafra.gov.on.ca/english/crops/facts/00-099.htm> page 6.
- <sup>106</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Pesticide Contamination of Farm Water Supplies: Recommendations on Avoidance, Cleanup and Responsibilities, Fact sheet Agdex #607 Order #00-099. Available at <http://www.omafra.gov.on.ca/english/crops/facts/00-099.htm>.
- <sup>107</sup> Ontario Ministry of Agriculture, Food and Rural Affairs, Pesticide Contamination of Farm Water Supplies: Recommendations on Avoidance, Cleanup and Responsibilities, Fact sheet Agdex #607 Order #00-099. Available at <http://www.omafra.gov.on.ca/english/crops/facts/00-099.htm>. Page 2.



- 
- <sup>108</sup> Ontario Ministry of the Environment, Ontario's Plan for Clean Air. Available at <http://www.ene.gov.on.ca/envision/air/airquality/clap.htm>.
- <sup>109</sup> Ontario Ministry of the Environment, Ontario's Clean Air Action Plan: Protecting Environmental and Human Health in Ontario, June 21, 2004. Available at <http://www.ene.gov.on.ca/programs/4708e.htm>.
- <sup>110</sup> Ministry of the Environment, Guideline A9 NOx Emissions from Boilers and Heaters, March 2001. Available at <http://www.ene.gov.on.ca/envision/gp/A9.pdf>. Page 4.
- <sup>111</sup> D.W.A. Sharp, The Penguin Dictionary of Chemistry, 1985. Page 67.
- <sup>112</sup> Ministry of the Environment, Combustion Equipment Data Sheet. Available at <http://www.ene.gov.on.ca/envision/gp/4130e.pdf>. Page 1.
- <sup>113</sup> Ontario Ministry of the Environment, Guideline A-9 NOx Emissions from Boilers and Heaters, March 2001. Available at <http://www.ene.gov.on.ca/envision/gp/A9.pdf>. Page 5.
- <sup>114</sup> Ontario Ministry of the Environment, Guideline A-9 NOx Emissions from Boilers and Heaters, March 2001. Available at <http://www.ene.gov.on.ca/envision/gp/A9.pdf>. Page 5.
- <sup>115</sup> Ontario Ministry of the Environment, telephone 416 327-1443 or fax 416 314-7919.
- <sup>116</sup> Michael Toombs, Noise Control on Farms, Ontario Ministry of Agriculture, Food and Rural Affairs, Fact Sheet. Order # 96-033 February 1996. Agdex 700. Available at <http://www.omafra.gov.on.ca/english/engineer/facts/96-033.htm>.
- <sup>117</sup> Michael Toombs, Noise Control on Farms, Ontario Ministry of Agriculture, Food and Rural Affairs, Fact Sheet. Order #96-033 February 1996. Agdex 700. Available at <http://www.omafra.gov.on.ca/english/engineer/facts/96-033.htm>, cited August 9, 2004.
- <sup>118</sup> Hugh Fraser, *Are you thinking about installing a wind generator?* in The Tender Fruit Grape Vine, November/December 2003 Volume 8, Issue 2. Page 9 and 10.
- <sup>119</sup> Hugh Fraser, *Are you thinking about installing a wind generator?* in The Tender Fruit Grape Vine, November/December 2003 Volume 8, Issue 2. Page 9 and 10.
- <sup>120</sup> Hugh Fraser, *Are you thinking about installing a wind generator?* in The Tender Fruit Grape Vine, November/December 2003 Volume 8, Issue 2 page 9 and 10.
- <sup>121</sup> H.W. Fraser, .H. Fisher and I Frensch, Bird Control on Grape and Tender Fruit Farms, OMAFRA Fact Sheet, Order #98-035, June 1998, Agdex 685/730.
- <sup>122</sup> Niagara Escarpment Commission, Do I need a Niagara Escarpment Permit. Available at <http://www.escarpment.org/Publications/permitbooklet.htm>.
- <sup>123</sup> Niagara Escarpment Commission, Frequently Asked Questions at <http://www.escarpment.org/About/faq.htm>.
- <sup>124</sup> Niagara Escarpment Commission, Summary of Changes of the 2005 Niagara Escarpment Plan. Available at [http://www.escarpment.org/Publications/NEP.2005\\_Summary.of.changes.pdf](http://www.escarpment.org/Publications/NEP.2005_Summary.of.changes.pdf). Pages 1 and 2.
- <sup>125</sup> Niagara Escarpment Commission. Available at <http://www.escarpment.org/About/faq.htm>.