Sustainable Winemaking Ontario:
An Environmental Charter for the Wine Industry

Sustainable Winemaking Ontario - Environmental Best Practice for Wineries

2007

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For the Wine Council of Ontario

Disclaimer: While every attempt has been made to make this information as accurate as possible, the Wine Council of Ontario and the authors assume no responsibility for decisions based on the contents of this document. Legal requirements can change rapidly and readers are encouraged to seek additional information.

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A Message from the Chairman of the Wine Council of Ontario

As Chair of the Wine Council of Ontario (WCO), I am pleased to present Sustainable Winemaking Ontario: An Environmental Charter.

Sustainable Winemaking Ontario addresses the environmental, economic and social aspects of sustainability and addresses winemaking, viticulture and winery hospitality services.

The WCO recognized the need to be proactive in creating a program that would help wineries develop the best practices in environmental stewardship.

The wine industry is intimately connected to the natural environment. It is dependant on soil, water, sunshine, and good management. This was all taken into account when producing a series of documents that we believe will improve the environmental performance of the Ontario wine industry, improve the quality of wine growing and wine making in an environmentally responsible manner

This important project by the WCO is the result of many years of hard work and commitment from various partners and stakeholders within the industry including the Grape Growers of Ontario and the Technical Committee who worked endlessly on this project: We are pleased to also recognize the California Association of Winegrape Growers who provided their insight and experiences in developing their own environmental program, as well as insights from both New Zealand and Australia. I would also like to personally thank former WCO president Linda Franklin for her endless commitment in leading this project as well as steering it to its final stage. I would also like to recognize Narelle Martin who played a key role in developing the materials and development of the program.

We believe Sustainable Winemaking Ontario will continue to develop and evolve over time, and provide a significant benefit to the wine industry. We are confident that this effective and informative program will not only benefit the Ontario wine industry but help sustain the environment in which we work and live.

Norm Beal
Chair
Wine Council of Ontario

Introduction

This document has been developed as one part of the program **Sustainable Winemaking Ontario: An Environmental Charter for the Wine Industry**. The program has been initiated and funded by the Wine Council of Ontario (WCO). The Grape Growers of Ontario have also been a valued partner throughout the development of the program.

Background to Sustainable Winemaking Ontario: An Environmental Charter for the Wine Industry

In Ontario there is a comparatively young wine industry that is expanding rapidly, competing with other land uses, challenged by a rapidly changing regulatory framework, and very interested in environmental sustainability.

By late 2003, members of the WCO decided that the wine industry in Ontario needed to have a proactive environmental program to help the wineries identify and adopt Best Practice environmental stewardship.

Sustainable Winemaking Ontario is a proactive program created to address this industry-wide interest and to help wineries identify and comply with existing regulations which are changing rapidly.

Changes to legislation have included: "the Safe Drinking Water Act, the Sustainable Water and Sewage Systems Act, the Nutrient Management Act and the Drinking Water Systems Regulation."[1] Watershed management is also being restructured.

In addition, there is a major cultural shift occurring within organizations, such as the Ministry of the Environment, as well as in public expectations. These have the potential to have a significant impact on a range of industries, including the wine industry. The proactive approach by the WCO to develop an environmental program will be judged as being extremely well timed and helpful.

While these regulatory changes are significant, the WCO is also clear about the need to go "beyond the rules" and to continually push for improved industry environmental performance. This document, and the related documents and workshops, are tools designed to assist the industry in the continuous improvement of its environmental performance.

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[1] Ontario Ministry of the Environment, Frequently Asked Questions about Water and its Usage available at http://www.ene.gov.on.ca/envision/water/waterFAQ.htm#side1

The following goals and benefits of Sustainable Winemaking Ontario have been identified during meetings and workshops with the industry.

Goals

The goals of Sustainable Winemaking Ontario are to:

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

Benefits

Sustainable Winemaking Ontario aims to deliver the following benefits to the wine industry:

- a framework including Best Practices that protects the environment while delivering economic efficiencies
- a format of continual improvement to assist companies that operate with a goal of improving their operational practices
- tools for measurement, analysis, feedback and reporting to allow the industry to continuously benchmark its performance
- information on emerging regulatory changes that is easily accessible to winemakers and viticulturalists
- assistance in ensuring access to international markets
- an increased assurance of food safety.

Sustainable Winegrowing Ontario addresses the environmental, economic and social aspects of sustainability.

Relationship with Other Documents

This document is one of a series that has been developed since October 2004. Related documents developed as part of the first phase of this project include:

- *Sustainable Winemaking Ontario: An Environmental Charter for the Wine Industry. Eco-Winegrowing 101*
- *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.

One of the priorities identified through discussions with the industry was to increase energy efficiencies for wineries. External funding was obtained to undertake research and to present workshops to the industry. In addition, two publicly available documents have been produced:

- Altech Environmental Consulting and Ontario Centre for Environmental Technology Advancement, *Developing Energy Benchmarks for the Ontario Wine Industry*, for the Wine Council of Ontario.
- Narelle Martin, *Energy Best Practice for Wineries*, for the Wine Council of Ontario.

In addition, 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.

Elements of Sustainable Winemaking Ontario

Sustainable Winemaking Ontario was initiated by the Wine Council of Ontario.

Sustainable Winemaking Ontario – Environmental Best Practice for Wineries has been developed after a review of other international models, and after direct input from members of the industry. The outcome is a "made in Ontario" process.

Sources for the content included in *Sustainable Winemaking Ontario – Environmental Best Practice for Wineries* (Best Practice) include: research undertaken for other Sustainable Winemaking Ontario publications, international wine and environment programs, the Canada-Ontario Environmental Farm Plan, the Integrated Fruit Production Guidelines for Apple Orchards in Canada, as well as staff sources from Ontario Ministry of Agriculture, Food and Rural Affairs, the Ontario Ministry of the Environment , the Niagara Escarpment Commission and other organizations and input from members of the industry. Their assistance has been greatly appreciated.

The shape and content of Best Practice has been overseen by the Technical Committee for Sustainable Winemaking Ontario. This has included both winemakers and grapegrowers. The work of the members has been extensive.

Structure

The self-evaluation program for wineries has been structured as a series of questions on a range of topics. Answers are typically 'yes' or 'no', with marks allocated to each answer. The answers have been weighted, using scoring from -20 to +20.

Scoring

The rationale for the scoring is:

-20 Unsustainable	This practice has significant negative environmental and or economic impacts, and may also be contrary to the legislation. Any score in this area is a red flag for the need to undertake a priority correction.
-10	Is likely to have negative environmental or economic consequences.
0	If for a no: An indication that the activity is preferred but if not undertaken immediately, there will be no major immediate consequences.
+10	Indicates good environmental practice and incorporating sustainable winemaking practices.
+20	Indicates leadership in environmental practice and excellence in environmental performance in this area.

How Has It Been Developed?

- A workshop was held in April 2005 with both winemakers and grapegrowers. This intense workshop identified the preferred process, and allocated priorities for the chapters to be written.
- Using existing research and documents as a starting point, the chapters were written.
- Chapters were reviewed by the Technical Committee, which includes both winery and grapegrowing expertise. Meetings were held before and after Crush 2005. Each chapter was reviewed in depth both for questions and scoring relevance.
- Chapters were rewritten, taking into account the comments.
- A workshop was held in November 2005 in Prince Edward County seeking input particularly on winter management issues.
- A briefing session was held with growers and wineries in South Western Ontario.
- A briefing session and workshop was held with stakeholders, including representatives of different government organizations.

- Drafts of documents were shared with stakeholders to elicit further feedback.
- The draft Sustainable Winemaking Ontario – Environmental Best Practice for Wineries and Vineyards was piloted with a number of wineries and vineyard operations. The results of the pilots and a subsequent industry workshop led to substantial reorganization and rewriting.

Pilots

A series of pilots to undertake a first-hand review the draft Best Practice manual took place from January 2006 to April 2006. Niagara College partnered with the WCO and graduate students in the environmental program assisted with a number of pilots.

The reviews led to substantial changes from the first draft. These included:

- the need to include a category for "not applicable" and accordingly adjust the scoring
- redrafting some sections to make them clearer, while some individual questions needed clarification, deletion or other refinement
- reworking the chapter on establishing a winery and vineyard into two separate approaches: a section included in this document for renovating or expanding an establishment and a separate document for newcomers to the industry
- changing the title of the chapter on wine quality (now called Industry Standards Awareness)
- reordering chapters
- adding a way of recording "quick fixes"
- adding more background information when appropriate, under the heading "Fast Facts"
- separating questions for vineyards, wineries and hospitality.

The last change was the most substantial. The piloted version has now been split into three documents, of which this is one. The hospitality document includes all questions and material for hospitality services offered through the wine industry. The consistent comment made in pilots, workshops and some stakeholder meetings was that there was some duplication with material in the Canada-Ontario Environmental Farm Plan.

To eliminate the overlap, vineyard questions are now bundled into an addendum for the Canada-Ontario Environmental Farm Plan. The viticulture questions that were included in the piloted version have been reviewed by a working group, consisting of: Hugh Fraser, Neil Carter and Donna Speranzini, all of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA); Mark Neufeld, representing the Grape Growers of Ontario; Gerry Walker of Agricorp and Narelle Martin, for the Wine Council of Ontario. The input of Wendy McFadden-Smith and Leslie Huffman is also appreciated. The

questions have been redrafted to be consistent with the format of the Environmental Farm Plan. These will be reviewed by other stakeholders and a growers committee. This revised material will allow the industry to have a series of Environmental Farm Workshops targeted specifically to the wine industry and grape growers.

Members of the wine industry in Ontario who require all three documents for a review of their operations should contact the Wine Council of Ontario.

Copies of all documents are also available on a disc through the Wine Council of Ontario.

Questions or Comments?

Sustainable Winemaking Ontario is a process that will continue to evolve. Any comments about the process and the content are welcome and should be addressed to:

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

Or sent by email to info@winesofontario.org

Narelle Martin
Two Hemispheres Environmental Consulting
on behalf of the Technical Committee

Acknowledgements

Sustainable Winemaking Ontario has been developed with significant industry input and assistance. It has been deliberately interactive, seeking feedback from the industry about the form and content of the material developed, and changed, at times radically, in response to that feedback.

Formal industry input has been obtained through the Technical Committee that was established through industry workshops and through pilots of initial drafts.

The Ontario wine industry acknowledges the assistance of the wine industries of New Zealand and California for access to their programs, input and advice. The programs developed, Sustainable Winegrowing New Zealand and Code of Sustainable Winegrowing Workbook provided models that were examined in some detail. Input from colleagues in California and New Zealand is gratefully acknowledged. In particular, thanks are provided to Karen Ross, President of the California Association of Winegrape Growers, Sally van der Zijpp, National Co-ordinator of Sustainable Winegrowing New Zealand, and Dr David Jordan of New Zealand for their assistance. In addition, models elsewhere were examined and provide valuable insights. Additional insights were also obtained through attendance at the 3rd Australian Wine Industry Environment Conference and Exhibition held in Adelaide, Australia in February 2005.

Substantial work has been undertaken by members of the wine industry in Ontario to develop this program. At each stage, the program has been adapted based on the feedback of industry members.

Members of the Technical Committee

Past and current members of the Technical Committee have shaped, reviewed and helped to write this document. They are:

- 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 (Chairman)
- Sean Hails, Andres Wines Ltd.*
- Jordan Harris, Niagara College
- 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 Estate 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.

The development of the documents has been a collaborative effort. Thanks are given to workshop attendants for the review of *Understanding Requirements*, (subsequently titled *Eco-Winegrowing 101*) on January 18, 2005:

- 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
- 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

Additional input into *Eco-Winegrowing 101* was obtained from:

- Ontario Ministry of the Environment
- Ontario Ministry of Agriculture, Food and Rural Affairs
- Niagara Escarpment Commission

- Stephen Bedford and Henri Bannemeer of Town of Niagara-on-the-Lake
- Niagara Peninsula Conservation Authority
- Liquor Control Board of Ontario
- Kevin Ker
- Wendy McFadden-Smith

The participants at a workshop in Prince Edward County held on November 8, 2005, helped develop the first draft of the chapter on winter management. They include:

- Norm Beal, Chairman, Wine Council of Ontario
- Lou Della Civita, Casa Dea Vineyards
- Linda Franklin, President, Wine Council of Ontario
- Elia Gallo, Black Creek Vineyards
- Caroline Granger, The Grange of Prince Edward Estate Winery
- Debra Marshall, Robert Thomas Vineyards
- Mike Peddlesden, The Grange of Prince Edward County
- Dan Sullivan, Rosehall Run

Niagara College is also a partner in the program. In addition to the input of staff from the College at Technical Committees, students of the Environmental Program at the College undertook pilots of a number of wineries and vineyards.

The assistance in the pilots of students of the Graduate Certificate Course, Environmental Management and Assessment at Niagara College is gratefully acknowledged. They include:

- Duarte Carreiro
- Ryan Currah
- Cheryl Horvath
- Al Jackson
- Mariela Paredes
- Crystal Slusarek
- Karin Suppelsa

Additional pilots were undertaken by Narelle Martin, of Two Hemispheres Environmental Consulting. In all, nine pilots were held. The assistance of the following wineries and vineyards to trial the content and process is appreciated:

- Cave Springs
- Coyote's Run
- Colio Estate Wines
- Forrer Farms
- The Grange of Prince Edward County

- Henry of Pelham
- Lake's Edge Vineyards
- Lakeview Cellars
- Pelee Island Winery (Vineyards)

Thanks are also due to the Working Party for the viticulture section of the Environmental Farm Plan, which was established after the completion of pilots. Working Party members are:

- Neil Carter, OMAFRA
- Hugh Fraser, OMAFRA
- Mark Neufeld, Grape Growers of Ontario
- Narelle Martin, for the Wine Council of Ontario
- Donna Speranzini, OMAFRA
- Gerry Walker, Agricorp

Additional input was received from Leslie Huffman of OMAFRA, and Wendy McFadden-Smith.

Finally, thanks are also due to the members of the Wine Council of Ontario who provided funding for the project, and the major partners for the program: the Grape Growers of Ontario and Niagara College.

How to Use This Document

This document is a tool to assist businesses in identifying ways to improve their sustainability. Environmental, economic and social criteria are addressed.

It is presented as a series of questions and answers for a range of topics. Not all questions will be relevant to you. Please skip any that do not apply.

This document addresses wineries. For hospitality issues, please see the related document, *Sustainable Winemaking Ontario – Environmental Best Practice for Winery Hospitality Services*. For grape growing, please see *Sustainable Winemaking Ontario: Viticulture Addendum to the Canada-Ontario Environmental Farm Plan*.

For each section there are a series of questions. Please tick or circle the answer that applies to your operation. If a question does not apply, then please tick or write N/A in the "Not Applicable" column.

Space has been provided for you to write in comments or any queries you may have for each question. It is recommended that you include any comments on "quick fixes" – activities that you could do straight away to improve your business (and improve your score).

Scoring

While the maximum score that any winery operation could obtain is 2,570 it is most unlikely that any enterprise will have that score. Answers can also result in a negative score, so that the winery operation's overall score may be much lower. There are a total of 2,590 negative points. It is possible to have a minus score for a particular topic.

The important thing is that the score allows your business to identify your current performance, and to identify ways to improve that performance over time. Scoring allows you to keep track of changes and help to identify priority areas.

Once you have reviewed each relevant chapter, please add up your totals for each section that you have addressed, and transfer the details onto the Score Summary. This will help provide an overview of the outcomes and provide you with a total score.

In addition, you should identify any questions for which you scored -20 by question number, on the Score Sheets.

Total Score

Adding up all marks will provide you with a raw total that you can use and compare each time you use the tool to review your performance.

Comparative Score (Your Percentage)

If you wish to compare your scores with industry averages or colleagues, then it is recommended that you take into account the number of "Not Applicable" answers and adjust your score accordingly. For example, if you have a Total Possible score of 110, and your score was 60 with 30 marks not applicable to your business, then your results would be:

Possible score: 110
Not applicable score: 30
Your potential maximum score: (110-30) = 80
Your score: 60
Comparative score: 60/80 = 75%

In addition to the printed version of this document, an electronic version has also been developed. It will do the math automatically.

Once you have gone through and scored yourself, you are asked to complete Action Plans to help you identify actions that will continuously improve your environmental performance and the sustainability of your practice. A format for Action Plans is included in this document.

Why Start by Focusing on Any -20 Scores?

Experience has shown that there is always a large variety of things that can be done to improve environmental performance. However, as a business you also have limited time and access to capital. Anything that has been scored as a -20 has been identified as having "significant negative environmental and or economic impacts, and may also be contrary to the legislation". These are the most important areas that need to be tackled first to reduce business, environmental and economic risks.

Areas with a score of -20 are likely to be a priority. You should identify Action Plans to address issues that have been identified.

What If You Have No -20 Scores?

Congratulations! Now you can focus on other aspects of your operations and identify which ones you can tackle to improve environmental performance over time. It is your call about which practice you may wish to change first. There could be advantage in identifying those things that will have both an environmental and economic impact.

In addition to a format for Action Plans, references for further information have also been included.

Score Summary: Wineries

Total Possible Scores	Topic Title	Your Score	"Not Applicable" Scores	Your Percentage	Your -20 Scores
	Example				
110	Planning and Monitoring	60	30	60/80 =75%	
110	**Total**				

Total Possible Scores	Water and Wastewater	Your Score	"Not Applicable" Scores	Your Percentage	Your -20 Scores
100	1. Water Quantity Tracking and Recording				
50	2. Water Quality Tracking and Recording				
50	3. Wells				
60	4. Waterways				
20	5. Drainage				
30	6. Watersheds				
40	7. Wastewater Treated by Municipality				
110	8. Wastewater Treated Onsite				
40	9. Wastewater Trucked Offsite				
60	10. Stormwater				
30	11. Water Use and Conservation: General				
30	12. Water Use and Conservation: Crush and Presses				
30	13. Water Use and Conservation: Tanks				
50	14. Water Use and Conservation: Barrels				
40	15. Water Use and Conservation: Bottling				
30	16. Water Use and				

	Conservation: Cellars				
30	17. Water Use and Conservation: Laboratories				
30	18. Water Use and Conservation: Landscaping				
830	**Total**				

Total Possible Scores	**Solid Waste Management**	**Your Score**	**"Not Applicable" Scores**	**Your Percentage**	**Your -20 Scores**
50	1. Training and Leadership				
30	2. Fruit Waste – Pomace (or Marc)				
10	3. Tank Bottoms, Lees and Musts				
50	4. Diatomaceous Earth				
60	5. Glass				
60	6. Paper Products				
20	7. Plastic				
30	8. Chemical Containers				
10	9. Cork				
10	10. Pallets and Wood Containers				
30	11. Metal Recycling Including Capsules				
30	12. Cooperage				
390	**Total**				

Total Possible Scores	**Material Handling**	**Your Score**	**"Not Applicable" Scores**	**Your Percentage**	**Your -20 Scores**
140	1. Hazardous Waste Materials and Disposal				
10	2. Petroleum Products				
50	3. Fuel Storage				
20	4. Emergency Response				
40	5. Cleaning Supplies				
260	**Total**				

Total Possible Scores	Energy Efficiency	Your Score	"Not Applicable" Scores	Your Percentage	Your -20 Scores
110	1. Planning and Monitoring				
50	2. Energy Economies				
140	3. Refrigeration Systems, Tanks and Lines				
80	4. Lighting – Shops and Facilities, Offices and Outdoor				
70	5. Heating, Ventilation and Air Conditioning (HVAC)				
40	6. Sustainable Power Sources				
60	7. Alternative Vehicle Fuel Sources and Technologies				
550	**Total**				

Total Possible Scores	Integrated Pest Management	Your Score	"Not Applicable" Scores	Your Percentage	Your -20 Scores
0	1. Pesticide Handling and Storage				
40	2. Mixing and Loading Pesticides				
40	**Total**				

Total Possible Scores	Relationship with Neighbours and the Community	Your Score	"Not Applicable" Scores	Your Percentage	Your -20 Scores
30	1. Providing Information				
20	2. Minimizing Nuisance				
50	3. Responding to complaints				
60	4. Community Action				
160	**Total**				

Total Possible Scores	Industry Standards Awareness	Your Score	"Not Applicable" Scores	Your Percentage	Your -20 Scores
40	1. Measuring Ripeness and Quality				
40	2. Tasting wine				
40	3. Knowledge of Wine Industry				
40	4. Viticultural Improvement				
30	5. Food safety and Security				
190	**Total**				

Total Possible Scores	Expansion or Renovation of an Existing Winery	Your Score	"Not Applicable" Scores	Your Percentage	Your -20 Scores
10	1. Obtaining approvals				
50	2. Vegetation Management				
30	3. Water Management				
10	4. Site Design				
50	5. Building Envelope				
150	**Total**				

Evaluation Sheets: Winery

Water and Wastewater

1	*Water Quantity Tracking and Recording*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
1-1	Do you know how much water you consume in the winery?		No		Yes			
1-2	Do you know how much water you consume per kilolitre of production?			No	Yes			
1-3	Are meters installed through different parts of the winery to measure water use?			No		Yes		
1-4	Do you have a recording system in place for all water consumed, for example, the Sustainable Winemaking Ontario Tracking Sheets, for the winery?			No	Yes			
1-5	Have you established targets for the reduction of water use per kilolitre of production?			No	Yes			
1-6	Have you established a team or person to identify ways to reduce water use and improve efficiencies?			No	Yes			
1-7	Can you demonstrate reductions in water use per kilolitre of production year over year, due to more efficient production?			No		Yes		
1-8	Do you get more than 50,000 litres of water from surface water (for example, lake, creek or pond) or groundwater?			Yes			No	
1-9	If "yes" to previous question, have you obtained your Permit to take water?	No			Yes			**This is a legal requirement.** See *Eco-Winegrowing 101.*
Total								

2	*Water Quality Tracking and Recording*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
2-1	Do you know where your water is supplied from?		No	Yes				
2-2	Do you have water supplied for drinking water and operations from piped municipal supplies?			Yes			No	If yes, skip to question 2-5.
2-3	Do you have water trucked in from municipalities for drinking water and winery operations?			Yes			No	If yes, answer 2-3-1, then 2-5 onwards
2-3-1	Are you aware of the changing requirements for water testing for drinking water that will affect you?	No			Yes			See *Eco-Winegrowing 101* for details
2-4	Do you have water supplied from wells or surface water for drinking water?			Yes			No	If yes, answer 2-4-1, then 2-5 onwards
2-4-1	Are you aware of the changing requirements for drinking water testing that will affect you?	No			Yes			See *Eco-Winegrowing 101* for details
2-5	Have you tested the quality of water used in production?			No	Yes			
2-6	Have you identified pretreatment options for production based on the outcome of the water testing?			No	Yes			
2-7	Have you installed pretreatment options based on the outcomes of your investigation and monitoring?			No	Yes			
Total								

3	*Wells* *Skip this section if you do not use wells or you do not have them on your property.* *If you do use wells or have them on your property, please respond more than once, i.e., respond for* ***each*** *well.*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
3-1	Is your well located so that it cannot be contaminated by material in surface water?				yes			
3-2	Do you know the distance from your drilled, bored or dug well of any potential contamination?		No	Yes				
3-3	Do you inspect the casing on an annual basis to ensure that it remains in good condition?		No		yes			
3-4	Does your well have a well cap, tightly secured and in good condition?		No	Yes				
3-5	Does your well have a screened vent?		No	Yes				
3-6	Does your well have surface material raised above normal ground level around the well casing?		No	Yes				
3-7	Does your well have appropriate casing depth and the right height above ground level?	No		Yes				This is a **legal requirement**
3-8	Do you have unused or abandoned wells on your property?			Yes				*Skip next questions if they do not apply*
3-8-1	Have all unused wells been capped, properly protected and maintained?	No		Yes				**Legal requirement**
3-8-2	Have all abandoned wells been properly plugged and sealed?	No		Yes				**Legal requirement**
3-9	Do you have a meter installed on the well?			No	Yes			
3-10	Do you monitor and record the quantity of water used from the well, both annually and through Crush?			No	Yes			
3-11	Do you ensure that you use water at the rate of infiltration?		No		Yes			
Total								

4	*Waterways* *Skip this section if you do not use water from surface water or do not have a waterway on your property*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
4-1	Are there buffer strips between existing waterways and vineyards?		No		Yes			
4-2	Have you established a buffer strip for creek and drain stabilization of at least 10 feet?		No		Yes			
4-3	Is the buffer strip native vegetation, for example, grasses?			No	Yes			
4-4	Have you contacted the Conservation Authority for advice/and or financial assistance for habitat restoration or reforestation?			No	Yes			
4-5	Have you received all approvals from authorities (Provincial, Conservation Authorities, Municipalities and NEC) before establishing a new watercourse crossing?	No		Yes				**Legal requirement**
4-6	Have you received all approvals from authorities (Provincial, Conservation Authorities, Municipalities and NEC) before installing a new dam?	No		Yes				
4-7	Do you regularly inspect bank conditions of streams and drains to ensure that there is no erosion?		No		Yes			
4-8	If you have identified erosion problems, do you then work to repair erosion?		No		Yes			
Total								

5	*Drainage*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
5-1	Do you have a functioning municipal drain on your property?			Yes				If no, skip 5-1-1 and 5-1-2
5-1-1	Do you keep the area around the drain that the municipality uses for maintenance clear of structures?		No	Yes				
5-1-2	Did you ensure that you have approvals from all authorities before you requested installation of a bridge, culvert or dam on municipal drains?	No		Yes				
5-2	Do you keep floatable material, for example branches, plastic material, located away from any drains – private or municipal?		No		Yes			
5-3	Do you ensure that all wastes are kept away from each drain on your property and do not pollute the water?	No		Yes				
5-4	Did you contact the Conservation Authority or Ministry of Natural Resources for advice before commencing maintenance on your own drain?			No	Yes			
Total								

6	*Watersheds*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
6-1	Do you know which watershed your winery or vineyard is part of?		No		Yes			
6-2	Do you contribute or participate in planning for watershed protection undertaken by your Conservation Authority?			No		Yes		
Total								

	Wastewater from Winery Production	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	**Your Comment: Why "Not Applicable" or Identify Quick Fixes**
7	***Part 1: Wastewater Treated by Municipality***							Complete **only** if your winery wastewater goes **via pipe** to the municipality wastewater treatment plant
7-1	Does your wastewater go to sewer and get treated by the municipality?			Yes				
7-2	Have you investigated Pollution prevention/cleaner production programs to reduce the amount of wastewater produced?			No	Yes			
7-3	Do you have a staff person with a responsibility for wastewater management?			No	Yes			
7-4	Do you monitor and record the quality of wastewater on a regular basis?		No	Yes				
7-5	Have you installed a meter (or weir) to measure the amount of wastewater produced in the winery?		No		Yes			
7-6	Have you negotiated with the municipality for a reduction of fees if there is a reduction in wastewater to be treated?			No	Yes			
Total								

8	***Part 2: Wastewater Treated Onsite*** ***Complete Part 2 only if your winery wastewater is treated onsite***	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	**Your Comment: Why "Not Applicable" or Identify Quick Fixes**
8-1	Do you treat your wastewater onsite?			Yes				
8-2	Do you have a staff person with a			No	Yes			

	responsibility for wastewater management?							
8-3	Is your wastewater treatment system designed with a design capacity of over 10,000 litres per day?	Don't Know		Yes			No	If yes, answer 8-4 and 8-5 If no, go to 8-6
8-4	If over 10,000 litres per day, have you received the approvals needed by the Ministry of the Environment (MOE)?	No		Yes				**Legal requirement**. See *Eco-Winegrowing 101* for more detail.
8-5	If you have a Certificate of Approval from MOE, is it located onsite?	No		Yes				**Legal requirement**
8-6	Is your wastewater system designed for under 10,000 litres per day?	Don't know		Yes			No	If no, then skip the following questions
8-7	Do you have the approvals needed from your regional or local municipality?	No		Yes				**Legal requirement**
8-8	Have you investigated a wastewater system that allows reuse of treated wastewater?			No		Yes		
8-9	Do you have good knowledge of the system installed, including size, location and operation?		No		Yes			
8-10	Was your system (e.g., septic tank system) installed by a licensed contractor?		No		Yes			
8-11	Do you regularly check the system to ensure it is operating effectively?		No		Yes			
8-12	Do you record the results of checking?			No	Yes			
8-13	Have all staff been trained on the "dos and don'ts" of the septic tank system?		No		Yes			
8-14	Do you have information in the washrooms advising people what may not be flushed?		No		Yes			
8-15	Do you have a grease trap installed?		No		Yes			
8-16	Do you have a system for checking and cleaning grease traps?		No		Yes			
Total								

9	*Part 3: Wastewater Trucked Offsite* ***Complete this section only if your winery wastewater is trucked offsite***	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
9-1	Do you truck your wastewater offsite?			Yes				
9-2	Do you have a staff person with a responsibility for wastewater management?			No	Yes			
9-3	Have you the approvals needed from your regional or local municipality?	No		Yes				**Legal requirement**
9-4	Do you have information in the washrooms advising people what may not be flushed?		No		Yes			
9-5	Do you have a grease trap installed?		No		Yes			
9-6	Do you have a system for checking and cleaning grease traps?		No		Yes			
Total								

10	*Stormwater: Wineries*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
10-1	Has the system been designed so that stormwater does not go to sanitary sewer or septic system but is managed separately?		No		Yes			
10-2	Do you know where all the stormwater drains are directed?		No		Yes			
10-3	Do you have a written record of all stormwater drains and where they lead to available onsite?		No		Yes			
10-4	Have you protected all stormwater drains from the possibility of contamination e.g. have mats or bungs set up?		No		Yes			

10-5	Do you have an emergency plan established and posted in the case of a spill getting into the stormwater system?		No		Yes			Should be established and training undertaken
10-6	Have you investigated whether stormwater can be recycled for garden, toilet flushing or other uses?			No	Yes			
10-7	Do you have checks in place to ensure that stormwater does not contaminate waterways for example, interceptors in catch basins?		No	Yes				
Total								

11	***Water Use and Conservation: General***	**Unsus-tainable -20**	**-10**	**0**	**+10**	**+20**	**Not Applicable**	**Your Comment: Why "Not Applicable" or Identify Quick Fixes**
11-1	Do you maintain and repair leaks to keep the water system in good repair?		No		Yes			
11-2	Are shut-off valves (or trigger hoses) used on all hoses in crush and press area?		No		Yes			
11-3	Do you train all vintage staff, cellar staff and laboratory staff in cleaning procedures and water conservation approaches?		No		Yes			
Total								

12	*Water Use and Conservation: Crush and Presses*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
12-1	Do you pre-clean and remove large material before washing?			No	Yes			
12-2	Do you have a cleaning procedure developed for the crush and press that reduces water use? E.g., pressure washer			No	Yes			
12-3	Have you investigated caustic reclamation and reuse?			No	Yes			
Total								

13	*Water Use and Conservation: Tanks*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
13-1	Have you investigated alternative cleaning methods (for example ozone systems for winery cleaning)?			No	Yes			
13-2	If water is used for cleaning tanks, have you estimated water use through measurement and calculations?		No		Yes			
13-3	If water is used for cleaning tanks, have you estimated any product loss through measurement and calculations?							
13-4	Have you installed high efficiency water nozzles to reduce water used in tank cleaning?		No	Yes				
13-5	Have you investigated reusing rinse water?		No		Yes			
Total								

14	*Water Use and Conservation: Barrels*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
14-1	Have you investigated cleaner production techniques to reduce the amount of water used in barrel cleaning?		No		Yes			
14-2	Have you reduced water use by installing high pressure/low volume nozzles for barrel washing?			No	Yes			
14-3	Do you control and monitor the temperature of the water?		No		Yes			
14-4	Do you track and record the amount of water used in barrel washing?			No	Yes			
14-5	Do you fill each barrel to the top to detect leaks and to seal?		Yes	No				
14-6	Have you investigated cleaner production approaches for barrel testing e.g. vacuum testing?		No		Yes			
Total								

15	*Water Use and Conservation: Bottling*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
15-1	Do you know how much water you use in bottling?		No		Yes			
15-2	Do you have established cleaning times for hot and cold water cleaning?		No		Yes			
15-3	Do you use water conservation methods when cleaning?		No		Yes			
15-4	Do you investigate alternative cleaning technologies?		No		Yes			
Total								

16	*Water Use and Conservation: Cellars*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
16-1	Have you investigated the relationship between water use and time used in cellar clean-up time?			No	Yes			
16-2	Do cellar hands use alternative cleaning methods (e.g., broom) for cleaning wherever possible?		No	Yes	Yes			
16-3	Are the floors of the cellar covered in material that assists in cleaning, e.g., epoxy, and designed to assist in cleaning?		No		Yes			
Total								

17	*Water Use and Conservation: Laboratories*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
17-1	Do you know how much water is used in the lab?		No		Yes			
17-2	Are faucets on sinks and rinse tanks fitted with water-saving devices (such as flow restrictors)?		No		Yes			
17-3	Have you investigated techniques for reducing water use and hazardous waste?		No		Yes			
Total								

18	*Water Use and Conservation: Landscaping*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
18-1	Have you made choices for landscaping that minimize the need for water and for the use of pesticides?		No		Yes			
18-2	Have you installed an efficient watering system, for example, a timer?			No	Yes			
18-3	Do you apply mulch on all garden beds to suppress weeds and reduce water use?			No	Yes			
Total								

Fast Facts

The wine industry obtains its water from a range of sources, and water is integral to the operation of the business. There have been substantial changes in expectations from government and the community in relation to the management of water resources.

Sustainable Winemaking Ontario is concerned with increasing all elements of sustainability of the wine industry: environment, economic and social. That also means that the industry must continue to be responsive to the changes in opinions about the protection and management of water resources, and be as proactive as possible.

Water Quantity

Before you can manage water or other resources, you must know how much you use. Wineries obtain water from a number of sources: directly by pipe from the municipality; trucked in from municipality supplies and stored onsite before use; obtained from ponds, rivers or dams; and harvested from rooftops and used in the winery or in landscaping.

Each of these sources has different treatment options which are covered in the questions on water quality. However, it is important to track how much water you are consuming in the winery so that you can measure your efficiency and identify savings.

The installation of meters can assist in identifying areas of major water usage. Where there is a hospitality area, being able to separate out the amount of water consumed in both areas assists in ensuring each area can be more efficient with the resource. Likewise, if there is a bed and breakfast operation or if seasonal staff is provided with accommodation, keeping track of the usage of water assists to minimize wastage and improve efficiencies.

This will become increasingly important as the demands for improved water quality leads to higher prices in water supplied to customers, as well in prices for the treatment of wastewater.

Having a recording system in place allows the business to manage the water more effectively, and to identify changes over time. Some tools to assist are the Sustainable Winemaking Tracking Sheets, which were established and trialed through vintage 2004. These are available through the WCO member's website at www.winesofontario.org or by contacting the Wine Council of Ontario offices at 905 684-8070 or by email at info@winesofontario.org.

Permit to Take Water

Both wineries and growers must have a Permit to Take Water if you are 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."[2]

Details of permits are available through the Ministry of the Environment, including application forms. Applications for taking water are issued for one, five or ten years. 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 also require a Development Permit from the Niagara Escarpment Commission. For further information see http://www.escarpment.org/permits/dpa.htm.[3] There are also implications under other Acts if you are proposing to take water by damming or diversion works. For further information, see *Eco-Winegrowing 101.*

Growers have the same obligations outlined above, but additional requirements in some areas. Niagara-on-the-Lake provides the only municipally administered irrigation system in Ontario. In Niagara-on-the-Lake you will also pay for the access to the water . For further information for growers in Niagara-on-the-Lake, call 905 468-3278.

> Within the Niagara Escarpment Development Control Area, the digging or the 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.[4]

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[2] Source: Slingerland, Ken; *Do I need a Permit to Take Water?* In The Tender Fruit Grape Vine, November/December 2003 Volume 8, Issue 2 page 5

[3] Source: Martin, Narelle; Eco-Winegrowing 101, Wine Council of Ontario, page 4.

[4] Source: Martin, Narelle; Eco-Winegrowing 101, Wine Council of Ontario, page 5.

Water Quality

There are a substantial number of new requirements in Ontario dealing with the provision of water, particularly drinking water. Businesses that receive their water from piped distribution from municipally treated water plants are not affected by the changes in Ontario's *Drinking-Water Systems Regulations*. Businesses that truck in water from a municipal system, or that draw water from their own surface water (such as creeks, dams, lakes and channels) or ground water are affected. Businesses that may be affected include:

- wineries
- vineyards that provide water services to staff facilities, for example houses for seasonal staff
- hospitality areas
- bed and breakfast establishments.

The regulations affecting these facilities undergo regular review, with the most recent in June 2006. Currently such facilities are regulated under Ontario Regulation 252/05. Examples of requirements may include sampling of water on at least a monthly basis, testing of drinking water samples at a laboratory licensed by the Ministry of the Environment for testing and the need for corrective action when adverse testing results are identified. Further information is available at http://www.ene.gov.on.ca/envision/water/sdwa/reg252.htm. See also *Eco-Winegrowing 101* for more detailed information.

Wells

There are a considerable number of requirements to ensure that water in wells is not contaminated. This includes construction and maintenance requirements for a variety of different types of wells.

When wells are no longer used, there are some decisions that need to be made. The biggest is whether the well will simply be unused, or abandoned. A well is unused when water is not actively drawn from the well but the owner wishes to have future access to the resource. In these cases the well must continue to be maintained in accordance with the regulations, including regular inspections. The provisions for abandoning a well are covered in the Wells Regulation. "Wells must be sealed if they are dry, discontinued before completion, or not being properly maintained. Wells that produce unpotable, salty, sulphurous or mineralized water must be abandoned.

"Wells may also have to be abandoned if it is determined that natural gas poses a potential hazard or if well construction standards have not been followed."[5]

All abandoned wells must be plugged with concrete or other suitable materials and sealed in accordance with the regulations. The Ministry of the Environment also recommends hiring a contractor to do this work.

Information on wells is available through the Ontario Ministry of the Environment and the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

Ministry of the Environment provides a series of Green Facts, including:

- important facts about water well construction at http://www.ene.gov.on.ca/cons/3788e01.pdf
- the protection of water quality in bored and dug wells at http://www.ene.gov.on.ca/cons/3962e01.pdf
- the protection of water quality in drilled wells at http://www.ene.gov.on.ca/cons/3961e01.pdf
- managing your water well in times of water shortage at http://www.ene.gov.on.ca/cons/3784e.pdf.

Ministry of Agriculture, Food and Rural Affairs also has publications on wells, including:

- Pesticide Contamination of Farm Supplies: Recommendations on Avoidance, Cleanup and Responsibilities (Factsheet) available at http://www.omafra.gov.on.ca/english/crops/facts/00-099.htm
- Private Water Well Owners – Dealing with Water Shortages (Factsheets): available at http://www.omafra.gov.on.ca/english/engineer/facts/99-025.htm
- Water Wells – Best Management Practices Book available for a small price and can be purchased at http://www.omafra.gov.on.ca/english/products/best.html.

[5] Ontario Ministry of the Environment; Green Facts: Important Facts About Water Well Construction, September 2003,p2. Available at http://www.ene.gov.on.ca/cons/3788e01.pdf

Waterways

Waterways, or watercourses, are defined quite broadly under different pieces of legislation. They can include lakes, reservoirs, rivers, streams, marshes, wetlands, canals and drains. They are important for fish habitat. There are a number of provincial and federal pieces of legislation that affect watercourses and what may be done on and around them. For further information, see pages 24 to 25 of *Eco-Winegrowing 101*.

Drainage

The following material is drawn from Eco-Winegrowing 101. Any property that has a municipal drain running through it has a number of obligations.

> "The installation of subsurface drainage is very common throughout Ontario. A person who has purchased land, or an existing landowner with drainage, needs to ensure that all the appropriate checks are in place. In addition, they may find that they are located in the watershed of a municipal drain.
>
> The establishment of municipal drains provides responsibilities both on the landholder and the municipality. These are spelled out in the factsheet "So, What is a Municipal Drain" available at http://www.omafra.gov.on.ca/english/engineer/facts/01-059.htm. Specific information and further background is also available at your Local Municipality.
>
> 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 may 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.[6]
>
> 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 mean they must be removed if there are

[6] Vander Veen, S.; Ministry of Agriculture and Food, So, What's A Municipal Drain? Factsheet #752 Order #01 – 059. Available at http://www.omafra.gov.on.ca/english/engineer/facts/01-059.htm, pages 2 and 3

repairs to the municipal drain needed. If you do decide to plant in areas that may require maintenance, then you risk loss of the grape vines in these areas.

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, for example, if you wish to install a bridge or culvert. Owners have no authority to build culverts on municipal drains. Should you wish for a culvert to be built you must contact the municipality first. Do not do it yourself; notify your municipality.[7] The Municipality either constructs the culvert itself, when appropriate, or will assess if the culvert is of the appropriate size and supervise construction.[8]

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.[9] Wastewater from wineries must not contaminate drainage water."[10] [11]

Rodent gates are wire mesh over drains leading into ditches to stop animals, such as muskrats, from climbing into drains. These should be examined regularly and maintained to reduce the chances of animals gaining access into the tile drains and damaging them, or being caught and blocking the drainage.

For further information on responsibilities associated with maintenance of drains, see *Eco-Winegrowing 101*, pages 20 to 22.

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[7] Vander Veen, S.; Ministry of Agriculture and Food, So, What's A Municipal Drain? Factsheet #752 Order #01 – 059. Available at http://www.omafra.gov.on.ca/english/engineer/facts/01-059.htm, page 3

[8] Bennemeer, Henri; 10 January 2005, Irrigation/Drainage Superintendent, Niagara-on-the-Lake.

[9] Vander Veen, S.; Ministry of Agriculture and Food, So, What's A Municipal Drain? Factsheet #752 Order #01 – 059. Available at http://www.omafra.gov.on.ca/english/engineer/facts/01-059.htm, page 3

[10] Gabriele, Linda; Ontario Ministry of the Environment, pers. Comment 19 November 2004

[11] Martin, Narelle; Eco-Winegrowing 101, pages 19 and 20

Watersheds

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. For further information on watersheds, see *Eco-Winegrowing 101*, pages 23 to 24.

Wastewater

There are three different generators of wastewater with the wine industry. Production wastewater from the making of wine; wastewater generated from taps and toilet systems within the winery and hospitality sections; and wastewater systems generated from houses on sites, for example, accommodation for staff, or owners' properties.

Wastewater from Winery Production

There are extensive regulations on the management of wastewater from production systems. These are outlined in detail in *Eco-Winegrowing 101*.[12]

Part 1: Wastewater Treated by the Municipality Via Pipe

Wineries with access to municipal treatment plants have the simplest arrangements for wastewater treatment. All waste generated will be treated by the municipality. Charges will be for both water provided and wastewater generated. The latter is usually charged based both on volume and strength of waste, usually pH and Biological Oxygen Demand (BOD). Wineries should measure both the water coming into the plant, and the volume being generated as it leaves. A number of wineries have been able to instigate pollution prevention approaches and reduce the amount of wastewater being generated (for example, through reusing water). Wineries may be able to negotiate with the municipalities for a reduced charge based on volumes of wastewater produced, rather than assuming that the amount of water coming out is the same as coming in.

[12]Martin, Narelle; *Eco-Winegrowing 101*, pages 13 to 19

Part 2: Wastewater Treated Onsite

Wineries that treat their onsite own wastewater from production have a number of obligations they must meet. These are outlined in detail in *Eco-Winegrowing 101*. A trigger for different legislation is design capacity of your treatment system. If a winery has a wastewater disposal system with a *design capacity* of over 10,000 litres per day, then a Certificate of Approval must be obtained from the Ministry of the Environment. If a winery has a wastewater system with a *design capacity* of 10,000 litres per day or less then approvals must be obtained through the municipality.

Wineries must consider their growth when designing expansions or installations of wastewater treatment plants.

Part 3: Wastewater Trucked Offsite

Wineries in different parts of the province have different requirements for wastewater. In Prince Edward County, all wineries without access to wastewater treatment plants by pipe are required to place their wastewater in holding tanks. The wastewater is then trucked to the wastewater treatment plant.

In other parts of the province, the Ministry of the Environment has indicated that "holding tanks will not generally be considered by Ministry of the Environment as a permanent solution for sewage management."[13] In addition, wineries may wish to have a holding tank available on hand as a contingency measure.

Wineries may also consider the reuse of treated wastewater for reuse for example for flushing of toilets, or for irrigation on gardens or vines. The Ministry of the Environment will consider site-specific applications for the re-use of effluent, taking into account appropriate safeguards. For further information, see *Eco-Winegrowing 101*, pages 17 and 18.

[13] Ontario Ministry of the Environment, quoted in *Eco-Winegrowing 101*, p17

Evaluation Sheets: Winery

Solid Waste Management

1	*Training and Leadership*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
1-1	Do you train all staff, for example, by making sure that all staff understand the company expectations, to reduce the amount of waste produced, reuse material and recycle?	No			Yes			
1-2	Do you encourage staff to identify innovations to reduce waste?		No		Yes			
1-3	Do you encourage your suppliers to minimize the amount of packaging that they use, and to incorporate recyclable materials in their packaging?			No	Yes			
1-4	Do you know how much recyclable material you capture and recycle?		No		Yes			
1-5	Have you increased the amount of recyclable material captured over the last three years?		No		Yes			
Total								

2	*Fruit Waste – Pomace (or Marc)*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
2-1	Do you know how much marc is produced in your winery?			No	Yes			
2-2	Have you considered alternatives such as distillation of the marc or developments of other products?			No	Yes			
2-3	Is your marc composted onsite or shipped for conversion into compost and organic fertilizer?		No		Yes			
2-4	If you apply marc to land, do you comply with the protocol for the Utilization of Waste Fruits on Agricultural Lands available through the Ministry of the Environment?	No		Yes				
Total								

3	*Tank Bottoms, Lees and Musts*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
3-1	Do you apply this material to land?		Yes	No				Not permitted by the Ministry of the Environment unless permission has been sought
3-2	Have you considered alternative reuse including distillation of this material?			No	Yes			
Total								

4	*Diatomaceous Earth*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
4-1	Have you researched cleaner production techniques and equipment that means you do not have to use diatomaceous earth?			No	Yes			
4-2	Have you implemented cleaner production techniques for filtering processes?			No		Yes		
4-3	Do you measure and record the amount of diatomaceous earth that you use each year?		No		Yes			
4-4	Do you include diatomaceous earth in composting material and apply it to land, in compliance with all guidelines?			No	Yes			
Total								

5	*Glass*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
5-1	Do you send all broken glass bottles in the bottling line to recycling?		No		Yes			
5-2	Do you make sure that you separate glass properly, for example, laboratories glass, and only recycle appropriate glass?		No		Yes			
5-3	Do you regularly review bottling line operations to reduce waste, including glass, packaging, glues and sealants (including cork)?		No		Yes			
5-4	Do you evaluate containers for wines to identify lighter and more energy efficient packaging, for example, alternatives to glass bottles or lighter bottles?			No	Yes			

5-5	Do you facilitate collection of bottles for recycling from your customers at your facility?			No	Yes			
5-6	Do you collect your tasting bar and promotional wine bottles for recycling?			No	Yes			
Total								

6	***Paper Products***	**Unsus-tainable -20**	**-10**	**0**	**+10**	**+20**	**Not Applicable**	**Your Comment: Why "Not Applicable" or Identify Quick Fixes**
6-1	Do you recycle all cardboard in the bottling and packaging areas?		No		Yes			
6-2	Do you reuse office paper where appropriate, for example with double-sided printing, and recycle spent paper?		No		Yes			
6-3	Do you use double-sided printing in the office where appropriate?		No		Yes			
6-4	Do you reduce the amount of paper consumed by using electronic means wherever possible (including publicity)?		No		Yes			
6-5	If you use paper towels in washrooms, do you use recycled, unbleached and non--printed paper?		No		Yes			
6-6	Do you minimize extra paper product waste in packaging and production through innovation, for example, by exploring more efficient packaging and marketing approaches in packaging and marketing?			No	Yes			
Total								

7	*Plastic*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
7-1	Do you minimize your purchase and use of plastic packaging, for example unnecessary plastic wrapping?		No		Yes			
7-2	Do you recycle all plastic from the winery using appropriate containers?		No		Yes			
Total								

8	*Chemical Containers*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
8-1	Do you consider environmental and health impacts of chemicals (including cleaning material) when you purchase them?		No		Yes			
8-2	Do you purchase concentrated versions, and use returnable or refillable containers, wherever possible?		No		Yes			
8-3	Do you recycle chemical containers wherever possible?		No		Yes			

Topic 9	*Cork*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
9-1	Do you collect all used corks for recycling?		No		Yes			
Total								

10	*Pallets and Wood Products*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
10-1	Have you investigated pallets made from recycled plastic?			No	Yes			
10-2	Do you repair pallets and reuse and recycle them wherever possible?		No	Yes				
Total								

11	*Metal Recycling*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
11-1	Do you separate metals out of the waste stream for recycling?		No		Yes			
11-2	Do you consider the ability to recycle material when making decisions about closures, for example, corks or caps?		No		Yes			
11-3	Do you recycle steel drums where the service is available?		No	Yes				
11-4	Do you recycle any metal cans and aluminium-based products?		No		Yes			
Total								

12	*Cooperage*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
12-1	Do you consider if the barrels purchased have come from sustainably managed forests?			No	Yes			
12-2	Do you have a formal system to track barrels by age and condition?			No	Yes			
12-3	Do you either sell used barrels or donate them to community groups?		No		Yes			
Total								

Fast Facts

Pomace

Pomace, or marc, are the stems, skins and seeds left after the grapes are crushed and pressed.

Pomace does not include the material at the bottom of the tanks (lees) which is usually much wetter than the marc and needs to be managed differently.

The Ministry of the Environment has confirmed that material produced onsite, i.e., marc, can be composted onsite with no additional approvals required. Note that the Ministry is also developing draft guidelines on aerobic composting.

Tank Bottoms, Lees and Musts

Section 3: The Ministry of the Environment has advised that a winery can seek approval for the application of materials from tank bottoms, lees and musts. If it is in liquid form then it may be applied as a soil conditioner to land. It must pass a slump test. Before applying material to land, advice and approval must be first sought from the Ministry of the Environment office. It should be noted that the Ministry of the Environment is seeking clarification on this matter and the interpretation may be subject to change.

Section 5: Not all glass materials can be recycled. Some types of glass, such as pyrex, a type of glass capable of being heated to very high temperatures cannot be recycled. These need to go to waste containers.

Evaluation Sheets: Winery

Materials Handling

1	*Hazardous Waste Materials and Disposal*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
1-1	Do you know the potential sources of any hazardous wastes in your business?	No		Yes				For further information, see Fast Facts below
1-2	Do you measure, monitor and track materials that could be classified as Liquid Industrial and Hazardous Waste?	No		Yes				
1-3	Do you identify individual staff as responsible for specific waste streams for recycling or disposal, for example, hazardous waste, glass and paper?		No		Yes			
1-4	Do you record the volume or weight of waste produced?							
1-5	Have you checked to see if you are a generator of hazardous waste as defined by the Ministry of the Environment?			No	Yes			
1-6	If you have sufficient quantities of hazardous waste, then have you registered with the Ministry of the Environment?	No			Yes			
1-7	Do you comply with all Workplace Hazardous Materials Information System (WHMIS) regulations including training and storage requirements for materials covered by legislation , i.e., Compressed gas, Flammable and Combustive material;	No			Yes			See Fast Facts below

	Oxidizing material; Poisonous and Infectious material; Corrosive material and Dangerously Reactive material?							
	Hazardous Waste Materials and Disposal (Cont.)	**Unsus-tainable -20**	**-10**	**0**	**+10**	**+20**	**Not Applicable**	**Your Comment: Why "Not Applicable" or Identify Quick Fixes**
1-8	When you use any product classified under WHMIS, do you consider alternative and more environmentally friendly products when they are available?		No		Yes			
1-9	Do you ensure that all staff have appropriate WHMIS training?	No			Yes			
1-10	If you have propane tanks onsite, do you ensure that you manage your propane tanks in accordance with regulations?	No			Yes			
1-11	Do you recycle tires, for example by taking tires to the depot for recycling?		No		Yes			
1-12	Have you tried to move from batteries for all small household style or office equipment by using recyclable, rechargeable, solar operated or some other non-hazardous system?		No		Yes			
1-13	Do you ensure all non-rechargeable or vehicular batteries are collected and taken to a hazardous waste collection site, or can be recycled where available?		No		Yes			
1-14	Do you consider environmental and safety issues when you choose your paints, for example, whether to use oil-based or water-based paints?		No		Yes			
1-15	Do you use appropriate disposal methods for paints and thinners?		No		Yes			

	Hazardous Waste Materials and Disposal (Cont.)	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
1-16	Do you choose non-aerosol dispensers in preference to aerosol cans?		No		Yes			
1-17	Do you store toxic or combustible aerosol products in a location that keeps material protected?		No		Yes			
Total								

2	*Petroleum Products*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
2-1	Do you, or your contractors if they are undertaking maintenance, dispose of lubricants, oils, coolants and solvents used in your business in accordance with regulations?	No			Yes			
2-2	Do you use oil as a dust suppressant on roads or footpaths?		Yes	No				See Fast Facts below
Total								

3	*Fuel Storage*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
3-1	Do you know the location of all bulk fuel storage tanks both underground and above ground?	No		Yes				
3-2	Have you mapped all fuel storage areas, including propane tanks?		No		Yes			
3-3	Have all tanks been installed by a registered contractor or under the supervision of a registered contractor?	No			Yes			
3-4	Do you ensure that all above-ground tanks have protection to catch all spills including a lip or containment wall where required?	No			Yes			
3-5	Do you dispose of all obsolete tanks in a correct manner, including draining all contents and disposing of them appropriately, and decommissioning tanks?		No		Yes			
3-6	Do you track and record the amount of fuel used and identify any losses in all underground tanks?	No			Yes			
Total								

4	*Emergency Response*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
4-1	Do you have clean-up materials at hand in case of spills, including materials like kitty litter?		No		Yes			
4-2	Do you have the phone numbers of appropriate organizations nearby for any emergency?	No		Yes				
4-3	Do you train staff in handling, spill prevention, control and clean-up?		No		Yes			
Total								

5	*Cleaning Supplies*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
5-1	Do you consider environmental and health impacts of cleaning products before you purchase them?		No		Yes			
5-2	Do you ensure that all product labels are read and complied with before usage?	No			Yes			
5-3	Do you purchase cleaning products with low toxicity where available?		No		Yes			
5-4	If you use outside cleaning contractors, do you specify the use of low toxicity cleaning materials?		No		Yes			
Total								

Fast Facts

Hazardous Waste Material and Disposal

Information on identifying whether your operation generates hazardous waste is outlined in *Eco-Winegrowing 101*. Hazardous wastes in the winery setting can include waste cleaners, solvents, waste pesticides, oils and lubricants. In addition, laboratories can generate potential hazardous materials which may be covered by legislation.

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.[14] Further information on hazardous waste may be found at http://www.ene.gov.on.ca/envision/land/hazardousWaste.htm

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

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

Increasingly, as wineries expand and do more in-house laboratory work, they need to be aware of and manage potential hazardous wastes.

Regulation 347 and 558/00 outlines 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

[14] Ontario Ministry of the Environment; Hazardous Waste available at http://www.ene.gov.on.ca/envision/land/hazardousWaste.htm Cited 12 January 2005

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."[15]

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." (Source: page 14 of Ministry of the Environment, Three Step Registration Process, available at http://www.ene.gov.on.ca/envision/env_reg/er/documents/2000/ra00e0002d-3-step.pdf

Appendix 2 of the document by the Ministry of the Environment outlines the Waste Classes that need to be considered. The following table is an example of the type of wastes that, typically, should be monitored by wineries.

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
Organic Wastes		
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

[15] Ontario 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 , cited 16 August 2004, p1

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
Compressed gases		
331	Waste compressed gases, including cylinders	Methane (natural gas), nitrous or nitric oxide, propane, butane

Source: Appendix 2 Ministry of the Environment Waste Classes, available at 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 the document "Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste" available at the Ministry of the Environment website at 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. (Source: Narelle Martin, *Eco-Winegrowing 101*, pages 30 and 31)

Eco-Winegrowing 101 is available to members of the WCO in the Members-only section of the WCO website. Printed copies are also available through the WCO offices.

Occupational Health and Safety and WHMIS

On June 30, 2006, the Occupation and Safety Act was extended to farming operations with paid employees. Further information is available at http://www.farmsafety.ca The following is from the Ministry of Labour:

"In addition to preparing a health and safety policy, the employer who regularly employs more than five employees must also have a program in place to implement that policy. This program will vary, depending upon the hazards encountered in a particular workplace. Program elements may include all or some of the following:

1. worker training, e.g., new employees, new equipment, new job procedures
2. workplace inspections and hazard analysis
3. Analysis of the accidents and illnesses occurring at the workplace
4. a health and safety budget
5. a formal means of communication to address promptly the concerns of workers
6. confined space entry procedure
7. lock-out procedure
8. machine guarding
9. material-handling practices and procedures
10. procedures specific to the individual farming operation, e.g., harvesting fruit, large animal handling
11. preventing occupational disease, e.g., preventing the transmission of diseases from animals to humans
12. maintenance and repairs
13. housekeeping
14. personal protective equipment, e.g., respirators, hearing protection
15. emergency procedures
16. first-aid and rescue procedures
17. electrical safety
18. fire prevention
19. engineering controls e.g., ventilation

Source: http://www.labour.gov.on.ca/english/hs/farming/policy.html.

Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazard communication standard. "The objective of WHMIS is to ensure the protection of Canadian workers from the adverse effects of hazardous materials through the provision of relevant information". Health Canada acts as the national co-ordinator of WHMIS. Further information is available at http://www.hc-sc.gc.ca/ewh-semt/occup-travail/index_e.html.

WHMIS requirements "place an onus on employers to ensure that controlled products used, stored, handled or disposed of in the workplace are properly labelled, MSDSs are made available to workers, and workers receive education and training to ensure the safe storage, handling and use of controlled products in the workplace." Source: http://www.hc-sc.gc.ca/ewh-semt/occup-travail/whmis-simdut/application/employer_requirements_e.html.

Petroleum Products

Farmers may dispose of domestic waste on their properties, but may not dispose of oils or liquids on their property. (Ministry of the Environment advice)

Waste oil can not be used as a dust suppressant. The Ministry of the Environment advises that Regulation 347, Section 5, subsection 4 prohibits the use of this material. However, some oil products are able to be used for dust suppressant. Contact your local Ministry of the Environment office for further information.

Fuel Storage

Inappropriate fuel storage and use can have significant risks to the environment both in terms of contamination of water and soil, as well as fire risk.

The *Ontario Environmental Farm Plan* has a very detailed checklist for petroleum products. In addition, you can see an outline of actions to reduce these risks at the related Fact Sheet, Infosheet #5 – Storage of Petroleum Products produced by OMAFRA, updated in March 2005 and available at http://www.omafra.gov.on.ca/english/environment/efp/infosheet_5.htm

It should be noted that installers of fuel tanks have their own requirements which also assist in protecting the environment and must be adhered to.

Should you purchase a property that has existing oil tanks then you may wish to obtain clarification whether the tanks have been installed appropriately. Ministry of the Environment advises that “buyer beware” applies particularly to old tanks. The Technical Safety and Standards Authority can provide further information on requirements.

Evaluation Sheets: Winery

Energy Efficiency

1	*Planning and Monitoring*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
1-1	Have you identified a person or established an energy efficiency team responsible for energy oversight and management?			No		Yes		
1-2	Do you have information on energy use or costs in your winery?	No		Yes				
1-3	Have you undertaken an energy efficiency audit of the whole winery either internally or with consultants?		No		Yes			
1-4	Do you have a formal monitoring and recording system to check energy use for the winery?		No		Yes			
1-5	Do you compare energy consumption year over year per unit of production?		No		Yes			
1-6	Do you have a scheduled plan incorporated into the capital budget to increase energy efficiency per unit of production?		No		Yes			
1-7	Do you keep track of all energy savings?			No	Yes			
1-8	Have you identified how to convert the energy savings to greenhouse gas (CO^2) savings?			No	Yes			
1-9	Have you identified ways of selling your greenhouse gas savings, if available?			No	Yes			
1-10	Do you consider energy efficiency and Best Practice in new winery design or expansion?	No			Yes			

1-11	Do you implement energy efficiency and Best Practice in new winery design or expansion?		No		Yes			
Total								

2	***Energy Economies***	***Unsus-tainable*** **-20**	-10	**0**	**+10**	**+20**	**Not Applicable**	**Your Comment: Why "Not Applicable" or Identify Quick Fixes**
2-1	Do you understand the tariff system used to charge for energy?		No		Yes			
2-2	Do you keep aware of the changes in the energy market in Ontario?		No		Yes			
2-3	Have you reviewed the rates being charged for energy and negotiated a better price structure?			No	Yes			
2-4	Have you identified opportunities to switch to off-peak power and reduced electricity charges for your business?			No	Yes			
2-5	Have you taken advantage of government grants for audits and to increasing energy efficiency?		No		Yes			
Total								

3	*Refrigeration Systems, Tanks and Lines*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
3-1	Have you conducted a refrigeration system energy audit within the last three years?		No		Yes			
3-2	Do you include refrigeration system efficiency as part of an overall energy monitoring and conservation plan?		No		Yes			
3-3	Do you have a proactive program for housekeeping, for example, by ensuring regular repair and maintenance of energy-using equipment, structured service shut-downs and monitoring energy accounts?		No		yes			
3-4	Do you identify opportunities for more operations in off-peak, low tariff times, for example, using "overchilling" refrigeration in off-peak load times?		No		Yes			
3-5	Have you in the past two years reviewed your cooling and refrigeration systems to ensure that the equipment is designed and run for optimal efficiency?		No		Yes			
3-6	Whenever there is an increase in production requiring investment in equipment, do you review the existing and proposed approach to identify opportunities for energy efficiency and reduction in costs?		No		Yes			
3-7	Do you identify ways to reduce the load on the refrigeration system, for example, keeping chiller doors closed?		No		Yes			
3-8	Do you consider fruit temperature at harvest in relation to energy use, for example, night harvesting of fruit?		No		Yes			

3	*Refrigeration Systems, Tanks and Lines (Cont.)*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
3-9	Do you identify new technologies that minimize energy consumption while maintaining or improving wine quality, e.g., low energy tank agitators, motors, drives and pumps?		No		Yes			
3-10	Have you undertaken or engaged consultants to undertake an energy audit of tank heating and cooling within two years?			No	Yes			
3-11	Do you locate tanks to reduce heating or cooling needs?			No	Yes			
3-12	Do you identify opportunities for increased energy efficiency for heating and cooling of tanks?		No		Yes			
3-13	Do you have a goal of insulating all of your temperature controlled tanks?		No		Yes			
3-14	Do you ensure that Glycol lines are insulated?		No		Yes			
Total								

4	*Lighting – Shops and Facilities, Offices and Outdoor*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
4-1	Have you organized a review of lighting within the last three years?		No		Yes			
4-2	Do you organize regular cleaning of all lighting?		No		Yes			

4-3	Have you installed high efficiency lighting - within the offices? - within the labs? - for outside lighting?			No No No	Yes Yes Yes			
4-4	Have you investigated automatic lighting technologies, for example, motion sensors and timers when appropriate?		No		Yes			
4-5	Have you reviewed the need for all lights, and removed or disconnected unnecessary lights?		No		Yes			
4-6	Do you consistently remind staff to turn off lighting and equipment not in use?		No		Yes			
Total								

5	***Heating, Ventilation and Air Conditioning (HVAC)***	**Unsus-tainable -20**	**-10**	**0**	**+10**	**+20**	**Not Applicable**	**Your Comment: Why "Not Applicable" or Identify Quick Fixes**
5-1	Have you had a consultant and or contractor undertake a HVAC system audit in the last 3 years?		No		yes			
5-2	Do you regularly schedule maintenance for the HVAC system?		No		Yes			
5-3	Do you attend workshops on energy efficiency and/or keep up to date with energy efficiency technologies?			No	Yes			
5-4	Are you aware of government funding programs to assist in increasing HVAC energy efficiency programs?			No	Yes			
5-5	Do you regularly check and maintain the building to reduce heating and cooling losses? For example, ensure that seals on windows are intact,		No		Yes			

	and building cladding is well maintained?							
5-6	Did you incorporate energy efficiency designs such as passive solar energy and geothermal energy into the building design or renovations wherever possible?			No		Yes		
Total								

6	***Sustainable Power Sources***	**Unsus-tainable -20**	**-10**	**0**	**+10**	**+20**	**Not Applicable**	**Your Comment: Why "Not Applicable" or Identify Quick Fixes**
6-1	Do you engage professionals, and or attend workshops or field days, to investigate the feasibility of all alternative sources of power and government grants?			No	Yes			
6-2	Do you consider alternative sources of power when designing expansions or renovations?			No	Yes			
6-3	Do you purchase green power sources available through the electricity grid?			No	Yes			
6-4	Have you investigated alternative sources of power, such as solar photovoltaic, passive solar hot water systems and wind power?			No	Yes			
Total								

7	*Alternative Vehicle Fuel Sources and Technologies*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
7-1	Do you know and systematically track the amount of fuel used in the winery and for sales?		No		Yes			
7-2	Do you undertake a systematic review of your fleet, including sales vehicles, of monthly fuel consumption and maintenance?			No	Yes			
7-3	Have you investigated alternative fuel sources and supplements including biodiesel, ethanol, propane, natural gas, methane or hydrogen for the winery?			No	Yes			
7-4	Have you installed alternative fuel sources and supplements including biodiesel, ethanol, propane, natural gas, methane or hydrogen for the winery?			No	Yes			
7-5	Do you purchase and use the most fuel efficient equipment of its type in vehicles and outside equipment in the wineries, for example, moving towards four-stroke engines when considering replacements?		No		Yes			
7-6	Have you considered hybrid vehicles for use in fleet operations?			No	Yes			
Total								

Fast Facts

The following notes provide more background for these questions. For more detailed assistance and information on energy and wineries, see *Sustainable Winemaking Ontario: Energy Best Practice for Wineries*, produced by the Wine Council of Ontario.

A proactive housekeeping program for your refrigeration system can include scheduling regular inspections and maintenance of equipment. Structured shutdown of equipment means that you can build in times when equipment will be turned off and maintenance, repair or replacement is undertaken. This compares to waiting until equipment is broken before maintenance takes place.

"Overchilling" is a technique being trialled in Australia where wine is over-chilled during off peak times and the refrigeration is left off during peak times. The idea is to shift more cooling to out-of-peak tariff loads. While this does not have an impact on the amount of energy used, by shifting it to off peak operations, savings on the monthly bills can be made. It is important to assess whether this is appropriate for each winery operation, particularly to ensure that wine quality is not impacted. For more examples, see A Guide to Energy Efficiency in Australian Wineries available at http://www.industry.gov.au/assets/documents/itrinternet/WineGuide20040206170704.pdf (pages 22, 29, 30).

Dust and grease on lighting fixtures can reduce the light that reaches the target area by as much as 30 per cent. Light fittings should be regularly cleaned.

Evaluation Sheets: Wineries

Integrated Pest Management

Please note that this section is included for the management of landscaping areas. If your winery does not use pesticides in management of the areas around the winery, please do not complete these sections.

Integrated pest management issues for the vineyard are treated separately with the vineyard book, and are not included in this section.

1	*Pesticide Handling and Storage*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
1-1	Do you report all major spills, fires or thefts involving pesticides to the Ontario Ministry of the Environment?	No		Yes				This is a legal requirement
1-2	Do you have contact details available for the Ministry of the Environment Spills Action Centre and the local municipality if there is a pesticide spill that will affect the environment?	No		Yes				
1-3	Do all assistants have formal pesticide training before they handle or use Schedule 2 or 5 pesticides under supervision?	No		Yes				
1-4	Do you or your consultant have pesticides stored in compliance with all provincial regulations?	No		Yes				
1-5	Do you store your pesticides in a separate free-standing building or cabinet used only for pesticides that comply with regulations?	No		Yes				

1	*Pesticide Handling and Storage (Cont.)*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
1-6	Do you store your pesticides so that there is an impermeable floor and a curb installed to contain leaks or spills?	No		Yes				
1-7	Do you ensure human safety by having an appropriate locked storage system, warning signs, ventilation, respiratory equipment and protective clothing, emergency phone numbers posted and only labeled containers?	No		Yes				
1-8	Have you ensured that your pesticide storage (or your consultant's pesticide storage) is well away from surface and ground water sources, including wells?	No		Yes				
Total								

2	*Mixing and Loading Pesticides*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
2-1	Do you ensure that mixing and loading of pesticides are kept well away from natural water sources/courses?		No		Yes			
2-2	Do you have mechanisms to prevent backflow into the water supply such as: a separate water tank *or* permanent anti-backflow device installed *or* an air gap maintained at least six inches above the sprayer tank?	No		Yes				
2-3	Do you ensure no soil contamination from spills or leakage in the mixing or loading area?		No		Yes			
2-4	Do you ensure that there is someone present at all times during filling?	No		Yes				
2-5	Do you dispose of sprayer rinse water to crops not listed on label?	Yes		No				
2-6	Do you dispose of un-rinsed containers on the farm?	Yes		No				
2-7	Do you use returnable or refillable containers wherever possible?			No	Yes			
2-8	Do you triple rinse or pressure rinse containers and take them to a recycling depot with paper or cardboard taken to a municipal landfill or wholesaler?		No		Yes			
Total								

Relations with Neighbours and the Community

1	*Providing Information*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
1-1	Where appropriate, do you provide information in advance to neighbours about upcoming changes in the winery or vineyard? For example, do you knock on neighbours doors to talk to them, issue newsletters and/or provide an after-hours contact number?		No		Yes			
1-2	Do you advise neighbours of the extent of potential noise issues, such as night-time processing?		No		Yes			
1-3	Is information available if required to the public about the winery processes so they understand how and why you do certain things through the year?		No		Yes			
Total								

2	*Minimizing Nuisance*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
2-1	Have you identified all noisy equipment in the winery that may cause a problem offsite and installed baffles, or relocated them as necessary?		No		Yes			
2-2	Have you worked to minimize light pollution from outside lighting?		No		Yes			
Total								

3	*Responding to Complaints*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
3-1	Do you have a nominated person for managing the complaints process?		No		Yes			
3-2	Do you log all complaints?		No		Yes			
3-3	Do you ensure that all complaints are followed up on?		No		Yes			
3-4	Do you have a written procedure for all staff to follow if they receive a complaint?		No		Yes			
3-5	Do you ensure that all staff are aware of the process?		No		Yes			
Total								

4	*Community Action*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
4-1	Do you participate in the development of watershed management plans in your area?			No		Yes		
4-2	Do you participate in trials with conservation groups or other environmental groups on your property?			No		Yes		
4-3	Do you have an established process to monitor proposals for development near your property and do you actively participate in discussion with potential developers and local government?	No				Yes		
Total								

Fast Facts

A challenge to wineries and vineyard operators is how to ensure good relationships with both neighbours and the community over time. New neighbours may not be aware of the realities of running a farm enterprise or a winery. Certainly, if a development has promoted "views over the vineyards" then promoters are unlikely to point out that this may mean the use of tractors and equipment at early or late hours, the use of sprays, and noise from equipment, farm workers, bird bangers and visitors.

Making sure that neighbours are well informed can significantly reduce future problems. This could be as simple as a written information sheet, or perhaps inviting neighbours in for a look around and wine tasting, providing up-to-date information and contact information at the same time.

Light pollution refers to unwanted light spilling from the targeted area. For example, a floodlight attached to a building may illuminate the grounds and access to the sheds, but may also light up a neighbour's bedroom. In more general terms, light can also spill upward and have an impact on native species. It also reduces the ability to see the night sky. To overcome this, well targeted lights with the appropriate designs that reduce upward glare, possibly combined with the use of sensors, can reduce the nuisance of unnecessary lighting.

Evaluation Sheets: Winery

Industry Standards Awareness

1	*Measuring Ripeness and Quality*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
1-1	Have you approached your growers to establish agreed-upon sampling and testing techniques?		No		Yes			
1-2	Do you consider at least one of juice Brix, Titratable Acid, and pH in grapes when deciding when fruit is mature?		No		Yes			
1-3	Have you together with the grower frequently evaluated the grapes in the vineyard as they mature, i.e. for ripeness, disease, pests and sensory testing?		No		Yes			
1-4	Do you keep records of quality parameters including Brix, TA and pH, harvest dates, weather conditions and yield for comparison year after year?		No		Yes			
Total								

2	*Tasting Wine*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
2-1	As a winery representative, do you provide feedback to your grower on the quality of the wine grapes on a systematic basis?		No		Yes			
2-2	Do you meet and taste your wine with the grower after harvest?		No		Yes			
2-3	Do you participate in comparative tastings of domestic and international wines, on a regular basis?		No		Yes			
2-4	Do you understand components of wine quality and how they can be traced back to the vineyard?		No		Yes			
Total								

3	*Knowledge of Wine Industry*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
3-1	Are you aware of trends such as regulatory issues, and harvests and consumption trends in the Ontario wine industry?		No		Yes			
3-2	Do you know the trends in market share in Ontario?		No		Yes			
3-3	Do you know of the trends and prices of juice and wines in other production areas?		No		Yes			
3-4	Do you keep up to date with knowledge about winegrowing and winemaking techniques by reading current materials, and attending conferences and seminars?		No		Yes			
Total								

4	*Viticultural Improvement*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
4-1	Do you assist in trials onsite to identify growing techniques that improve the quality of wine?			No		Yes		
4-2	Do you work with the grower or consultants to identify viticultural practices that had a positive or negative impact on wine quality?		No		Yes			
4-3	Do you understand the relationship between vine balance, vine health and wine quality?		No		Yes			
Total								

5	*Food Safety and Security*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
5-1	Are you aware of the development of the Hazardous Analysis and Critical Control Points (HACCP) program with the Wine Council of Ontario?			No	Yes			
5-2	Have you initiated a HACCP program at your winery/processing facility?			No		Yes		
Total								

Evaluation Sheets: Winery

Expansion or Renovation of an Existing Winery

If you are considering an expansion or renovation then please address the questions applicable to you.

1	*Obtaining Approvals*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
1-1	Have you identified all of the planning stages in expanding your winery?		No	Yes				
1-2	Have you allocated enough time to obtain all approvals from all levels of government? For example, Ministry of the Environment, Conservation Authority, Municipality and the Niagara Escarpment Commission?		No		Yes			
1-3	If needed, have you applied for and received your permit to take water?	No		Yes				
1-4	Have you examined whether the expansion will lead to changes in your wastewater system?	No		Yes				
1-5	Have you applied for amendments to permits for air emissions, for example, for boilers, where required?	No		Yes				
1-6	Have you considered how you will manage an increase of waste?		No	Yes				

2	*Vegetation Management*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
2-1	Have you identified all vegetation that is to be retained, enhanced or removed?		No		Yes			
2-2	Have you identified areas where new native vegetation is to be planted?			No	Yes			
2-3	Have you considered linkages between vegetation to be retained and vegetation offsite to assist in wildlife movement?			No	Yes			
2-4	Have you considered the use of vegetation as buffers, particularly for neighbours?		No		Yes			
2-5	Have you considered planting native vegetation near waterways to assist in water quality and maintaining fish habitat?		No		Yes			
Total								

3	*Water Management*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
3-1	Have you identified locations of any pipelines for water coming onto the property, or wastewater pipes that might have an impact on your renovation?		No		Yes			
3-2	Have you designed your renovations to keep any winery waste from getting into stormwater drains?	No			Yes			
3-3	Wherever possible, have you kept buffers of un-mown native vegetation alongside waterways?			No	Yes			
Total								

4	*Site Design*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
4-1	Have you been able to make related changes to overcome longstanding problems, for example, noise and lighting concerns?			No	Yes			
Total								

5	*Building Envelope*	Unsus-tainable -20	-10	0	+10	+20	Not Applicable	Your Comment: Why "Not Applicable" or Identify Quick Fixes
5-1	Have you considered environmental issues in the design and construction of your renovations, for example, reducing energy consumption and managing water more efficiently?		No		Yes			
5-2	Did you make reference to the Leadership in Energy and Environmental Design (LEED) program for assistance in design and construction decisions for your buildings?		No			Yes		
5-3	Have you designed energy and water systems to reduce the ongoing environmental impact and costs of the building's operation?		No			Yes		
Total								

Action Sheets

Now that you have reviewed the checklists, you will have been able to identify some areas where you wish to make changes.

It is recommended that you consider two areas as priorities: "Quick Fixes" that you may have identified in the review, and any questions where you may have identified a score of -20.

"Quick Fixes" are items that as you went through the checklists you may have thought, "that's a good idea" or "we can fix that straightaway". Often they are about changes in processes or staff responsibilities. They may not cost anything, but help to become more effective from a business or environmental point of view.

Those scores that may be -20 responses are ones that may have a significant impact, and could also have legal implications. Identifying ways to address these issues helps to reduce risks to your business.

The Action Sheets attached are simply a way to help plan for the "what next". The decisions about what can be done to continuously improve the sustainability of your business – environmental, economic and social – will depend on the resources that are available. In some cases, there may be ways of rearranging work or identifying key people which will improve your business, and may also change a score at little or no cost. Other times there could potentially be requirements of money from the budget, time implications, and the need to engage outside help, perhaps from consultants.

It is recognized that the choices made will vary from one business to another. This process is about continuous improvement.

Please photocopy more Action Sheets as you require them.

Chapter that was reviewed: ……Date of Review:

Staff who carried out review:

Priority issue to be addressed:				
Who should address this? Who will assist?	What other resources are needed?	Plan of action:	What will indicate success?	What is the timetable?
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Pesticide Action Network (PAN). This is an extensive database that lists pesticides by both chemical names and product names, with cross references to other databases. It is available at http://www.pesticideinfo.org. The website also includes a listing of all chemicals used in the wine industry in California at http://www.pesticideinfo.org/DS.jsp?sk=29143 .

Industry Standards Awareness

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