



**Agrichemical Warehousing  
Standards Association**

# Protected Agriculture Stewardship Standards

January 1, 2026

**CONDENSED VERSION FOR BASIC CERTIFICATION**



[www.awsa.ca](http://www.awsa.ca)



# Protected Agriculture Stewardship Standards

## How to Use this Guide

This guide lists the protocols for compliance certification with the Protected Agriculture Stewardship Standards. The first section contains policies and processes applicable to the Standards. The second section contains the protocols and describes the audit evidence required for each protocol. A Compliance Assistance Manual has been prepared to provide further guidance and interpretation of the Standards. This is available electronically and is posted on the Agricultural Warehouse Standards Association (AWSA) website ([www.awsa.ca](http://www.awsa.ca)). Between issuance of versions of this guide, interim changes and interpretations will be posted on the AWSA website ([www.awsa.ca](http://www.awsa.ca)). Once posted they will be considered as part of the Standards.

## Technical Questions

Technical questions or questions about interpretation of the Standards may be addressed to the AWSA Program Manager at [manager@awsa.ca](mailto:manager@awsa.ca) (1-877-236-2972) or by contacting one of the program auditors. Please visit [www.awsa.ca](http://www.awsa.ca) for regular technical updates.

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## DISCLAIMER

The Protected Agriculture Stewardship Standards that follow are intended to be used by Agricultural Warehousing Standards Association (AWSA) for the purpose of issuance of a Compliance Certificate. Neither CropLife Canada, AWSA, their employees, members, allied associations or agents have made or hereby purport to make any representation, warranties or covenants with respect to the specifications or information contained in these compliance standards or the results generated by their use, nor will they be liable for damage or loss of claims, including those of an incidental or consequential nature, arising out of these compliance standards. These standards are not in any way intended to supersede or detract from any requirements contained in municipal, provincial or federal by-laws, regulations or legislation.

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## **PREAMBLE**

The 2016 Proposed Re-evaluation Decision by PMRA ([PRVD2016-20](#)) for Imidacloprid raised water quality concerns related to greenhouse product use. As a result, a group of impacted stakeholders agreed to work towards the development of a credible protected agriculture pesticide lifecycle stewardship program. The approach focuses on adherence to a national standard that supports compliance with registered pesticide label directions and the mitigation of risks associated with crop protection tools, fostering the health and safety of people and the environment. “Protected agriculture” refers to crops that are grown under structures such as greenhouses, shade houses, high tunnels, warehouses, etc. Crops grown using these systems include fruit, vegetables, flowers and other commercial crops (e.g., cannabis). Further clarity is provided in the Scope section.

## **INTRODUCTION**

CropLife Canada and its members, in consultation with national and provincial grower organizations, created the Protected Agriculture Stewardship Standards to assist operators in the identification and mitigation of risks associated with the use of crop protection tools. The Standards were drafted by a multi-stakeholder committee committed to the continuous improvement of environmental, health and safety risks in the Canadian protected agriculture sector. Health Canada’s Pest Management Regulatory Agency (PMRA) and Agriculture and Agri-Food Canada (AAFC) acted in an advisory capacity to guide development of the standards.

The initiative is currently in Phase 1 which applies to all Protected Agriculture operations for all crops using Pest Control Product (PCP) registered products labelled for greenhouse use. All other PCP’s are out of scope for Phase 1. Effective January 1, 2024 all Category 1 operations will need to present proof of certification and Category 2 operations will need to have a waiver (see definition under scope) in place in order to purchase the aforementioned products.

The Protected Agriculture Stewardship Standards are managed and audited by the AWSA.

## **VISION STATEMENT**

A credible pesticide lifecycle stewardship approach comprised of adherence to national standards for protected agriculture that are within industry control and that support compliance with registered pesticide label directions to ensure the health and safety of people and the environment.

## **OBJECTIVE**

The development of auditable protocols to assist operators in the identification and mitigation of risks associated with pesticide application with the longer-term goal of continuous environmental, health and safety improvement.

## SCOPE

Protected Agriculture (PA) refers to crops that are grown under fixed structures such as greenhouses and warehouses. The program is not intended to capture shade houses, hoop houses, high tunnels or similar structures with open sides that are not self-contained.

### Phase 1:

Effective January 1, 2024, any PA operator wishing to purchase PCP registered products labelled for greenhouse use will either need to be certified under the program (applies to all Category 1 PA operations) or have a Category 2 PA waiver in place (applies to all Category 2 PA operations). The Category 2 waiver allows an operation to self-declare that it falls outside of the definition for Category 1 operations (i.e. Category 2 operations do not capture and recirculate irrigation water as defined below). Waivers can be acquired through registration at [www.awsa.ca](http://www.awsa.ca). Please note that this declaration does not relieve operators of their obligations as defined by the [Pest Control Products Act](#) and specific product label requirements.

Category	Description	Requirement
Category 1 Protected Ag Operations	<ul style="list-style-type: none"><li>All PA operations, of any crop, using <u>closed-loop</u> chemigation systems. A closed system is one where any excess chemigation liquid delivered to the crop is captured via trough, drainage tile, or other similar conveyance system, rather than allowed to percolate into the ground.</li><li>Any mixed operations must be certified on portions of the facility that fall under Category 1 definitions.</li><li>Note - Warehouse production structures and freight container growing operations with no subterranean plumbing and continuous flooring are excluded from Category 1.</li></ul>	Must be certified under the PAS Standards before December 31, 2023 to be eligible receive PCP registered products labelled for greenhouse use as of January 1, 2024.
Category 2 Protected Ag Operations	<ul style="list-style-type: none"><li>All PA operations, of any crop, using <u>open</u> chemigation systems where excess chemigation liquid is not captured.</li><li>Warehouse production structures.</li><li>Freight container growing operations.</li></ul>	Effective January 1, 2024 must provide crop protection product supplier with a waiver declaring the operation falls into Category 2 in order to receive PCP registered products labelled for greenhouse use.

Effective January 1, 2024 all ag-retailers will be required to verify all Category 1 Operators' PAS certification number prior to shipping/selling PCP registered products labelled for greenhouse use.

Effective January 1, 2024 all ag-retailers will be required to have a waiver on file for all Category 2 PA Operators prior to shipping/selling PCP registered products labelled for greenhouse use.

## **AUDIT PROCESS & CYCLE**

The PAS Standards audit assesses the operation's compliance against the established Standards. The audit consists of 4 mandatory protocols that must be satisfied for PAS certification to be granted.

The audit also consists of additional protocols to achieve a Certificate of Excellence (COE). These protocols represent industry best practices and in some instances are legal requirements. We encourage all growers to review the COE protocols and consider Excellence Certification as a demonstration of your commitment to workplace excellence. Completion of all protocols will result in a Certificate of Excellence (COE). Options to utilize the COE as a tool to meet other third party requirements are being explored.

A successful audit will allow the PA operation to access PCP registered products labelled for greenhouse use from ag-retailers and distributors. The purpose of each protocol is to provide the Auditor with a step-by-step guide in collecting evidence about an operation's facility and practices that have been included within the scope of the audit. The audit is a systematic comparison of the operation against established standards.

Note: These standards are applicable to the issuance of a compliance certification for the PAS Standards. The Standards and the audit thereof, is not an assessment of regulatory compliance. Operators are responsible for compliance with all regulatory requirements.

### **Site Definition for Auditing and Certificate Issuance – Category 1**

Each Category 1 PA operation must successfully complete an audit to achieve certification. For the purposes of certification, a site is described as one unique location (specific address and/or land location) which has a closed loop chemigation system present in all or part of their protected ag structures. A site may have multiple structures at this location which have defined areas for pesticide storage and mixing/loading that would form part of the audit. A site may span multiple addresses and will be considered a single site provided that the sites are adjacent.

Organizations that have multiple locations that have any or all of the following at each location are subject to an audit:

- Have a closed looped chemigation system
- have a defined storage area for pesticides used at a closed loop operation
- have a defined pesticide mixing/loading area for closed loop chemigation systems.

Each different location (address and/or land location) will be treated as a separate audit and a separate certification number will be issued.

### **Audit Cycle**

1. The frequency for auditing is every two years. Certification expiration dates are always the last day of the year in which a re-audit is required. For example, if an operation was successfully audited and certified any time during 2022, they will have an expiration date of December 31, 2024. They will be required to be re-audited within calendar year 2024 and each successive two-year period.
2. The timing of the initial audit or re-audit will be at the discretion of each operation's owner/management and an accredited AWSA Auditor. Operations requiring an audit must have successfully completed their initial audit by January 1, 2024 in order to purchase PCP registered products labelled for greenhouse use. For re-audits, audits may be completed anytime within the required 2-year timeframe.
3. Operations must successfully complete a re-audit prior to the certification lapse date to maintain PAS certification. Operations that lapse will lose their certification status making them in-eligible to access PCP registered products labelled for greenhouse use from ag-retailers, distributors and/or manufacturers. Once successfully re-audited, certification will be reinstated.
4. If an operation's Compliance Certificate has lapsed, the original re-audit cycle will remain. For example: If an operation was first accredited in October 2022, its re-audit is due by December 31<sup>st</sup> of each successive year i.e. 2024, 2026, 2028, etc.

### **Booking Your Audit**

Upon initial registration with AWSA, an Auditor will be assigned. Audits should be scheduled several months prior to the audit due date to avoid a shortage of auditing services. Operators are responsible for working with their Auditors to book and complete the audit. Auditors may change for subsequent re-audits. Operators may request a change in Auditor by contacting AWSA.

### **Fees**

Each operation will be invoiced for the audit directly by the Auditor. An Audit Time Estimate Card will be made available by AWSA upon registration. The cost of the audit will vary depending on a number of factors, including size of the operations, availability of relevant paperwork, preparedness of the operator and number of interactions required. Operators will receive a feedback form directly from AWSA and are welcome to submit concerns related to the effectiveness or cost of the audit process.

## **Prior to the Audit**

1. Ensure that you, as the operator, and employees involved in the storage, handling and application of pesticides have read and understood the audit protocols and the objective of the audit.
2. Conduct a self-audit using the protocols to measure compliance with the standards.
3. Advise all employees when the audit will be conducted in advance of the scheduled audit.

## **Audit Process**

Audits initially will be conducted virtually. Many of the protocols are documentation based and can be reviewed electronically by AWSA Auditors. In addition to documentation review, Auditors will be using telephone interviews, photographs, and live video walking tours of sites to conduct audits. A virtual audit template can be found on the following page.

Operators will need to allocate ample time to discuss the audit process and the results with the Auditor. Ensuring that all relevant documents are readily available for review by the Auditor (i.e., operating procedures, check lists, emergency response plans, site map, training files, etc.) will make the process more efficient. The Auditor will ask for the operator to explain operation process flows to verify written operational procedures.

During the audit process incomplete items will be flagged and action lists generated. Operators will continue to work with their auditor. Once all action items are completed to the auditor's satisfaction an electronic report will be generated and certification will be granted.

AWSA reserves the right to complete an in-person audit if the virtual audit is deemed inconclusive by the auditor. Additionally, AWSA may implement in person audit requirements for future audit cycles.

## TERMS AND CONDITIONS OF CERTIFICATION

Prior to the issuance of a certificate, operators will be required to electronically review and agree to the following terms and condition of the compliance audit and certification. The Operator acknowledges and agrees to the following:

- (a) Operator accepts the PAS Standards established by CropLife Canada and as updated from time to time (the “Standards”), and agrees to the appeal process established by CropLife Canada for the resolution of disputes arising with respect to the Site’s compliance with the Standards;
- (b) Operator understands and agrees that in order to obtain a Compliance Certificate for the Site, Operator must obtain independent certification by an independent auditor (“Auditor”) on the list approved by CropLife Canada, confirming that the Site is in compliance with the Standards. Operator is solely responsible for compliance with the Standards;
- (c) Operators will permit access to the Site for the purposes of the compliance assessment of the site in connection this audit, and for any-reinspection of the Site in accordance with PAS Standards policies in effect;
- (d) Subject to the appeal process established by CropLife Canada and updated from time to time, Operator agrees to be bound by the Auditor’s findings with respect to the Site;
- (e) Operator agrees to pay any costs and expenses arising in connection with the certification of the Site, including the Auditor’s fees and expenses;
- (f) Operator understands that non-compliance with the Standards will result in the suspension of sales and shipments to Operator by manufacturers or distributors of pesticides until such time as certification is obtained;
- (g) Operator releases any and all claims it has or may in future have against AWSA, CropLife Canada, Funnel Communications Inc. and their successor, or such other Standards manager or administrator as CropLife Canada may designate from time to time and their respective members, directors, officers and employees and any auditor or senior auditor in connection with this application, the suspension of sales or shipments by manufacturers and distributors of pesticides, any audits conducted at the Site and any failure by the Operator to obtain a Compliance Certificate;
- (h) If Operator obtains a Compliance Certificate in respect of the Site, Operator understands that the obligation to maintain the site according to the Standards is ongoing and Operator must continue to comply with the Standards in order to maintain its Compliance Certificate.
- (i) Operator agrees to share data for the purposes of seeking and maintaining certification. All data collected will be maintained in compliance with AWSA’s data collection policy. A list of certificate holders will be made available to AWSA certified Ag-retailers for the purposes of confirming certification.

## COMPLIANCE & ENFORCEMENT

As of January 1, 2024 only Category 1 PA operations (as defined under the “Scope”) that have successfully completed the PAS Standards audit and been certified or Category 2 PA operations with a waiver in place will be eligible to receive shipments of PCP registered products labelled for greenhouse use. Operators are required to maintain their operations in compliance with the Standards at all times. If a situation exists where non-compliance is detected, a compliance process exists to investigate the situation and prescribe remedial action. If an un-certified operator receives PCP registered products labelled for greenhouse use, a compliance process exists to investigate.

### 1. Compliance Procedure

Alleged non-compliance with the Standards (outside of biennial facility audits) may be brought to the attention of AWSA in various ways, including:

- a. from the general public (e.g. through “whistle blowers”); and
- b. from an auditor in the course of an investigation (e.g. due to a reported incident) or a random facility inspection taking place under the Quality Assurance Program.

Disclosures of alleged non-compliance with the Standards must be submitted in writing to the Program Manager via e-mail at [manager@awsa.ca](mailto:manager@awsa.ca). Such disclosures must set out the details of the alleged non-compliance (including time, date, place, facility, nature of alleged non-compliance).

The Program Manager will not disclose and will protect the identity of whistle blowers pursuant to the paragraph above.

### 2. Qualification Process

- a) Program manager will investigate which will include a discussion with the Operator and may include assignment to an Auditor for a site visit;
- b) As a working goal, the complaint is to be addressed within three working days;
- c) Program manager will make an immediate initial report to the AWSA Executive Director;
- d) AWSA Executive Director will review the report in conjunction with the PAS Technical Committee as appropriate, and direct the Program manager on an appropriate response and course of action; and
- e) Program manager to notify the operation of course of action as a working goal before the fourth working day as to status.

### 3. Resolution Process

- a) Operation is advised in writing and is given a prescribed number of working days to undertake and complete corrective action measures dependent upon the type of non-compliance. This decision is made by AWSA and not the auditor independently;
- b) Operator to confirm in writing that the non-compliant situation has been corrected;
- c) If non-compliance situation is not corrected within the prescribed timeframe, certification is withdrawn. To then obtain re-certification, a successfully complete re-audit is required at the operation's expense;
- d) At AWSA's expense AWSA has the option for a second Auditor to visit operation to confirm compliance.

## APPEALS PROCESS

The Appeals Policy identifies potential areas where appeals may be made and the procedures to identify, qualify and adjudicate.

### Part A: Code Audit/Compliance Interpretation Appeals Process

Part A applies to:

- a) Protocol interpretation discrepancies between Operators and Auditors during the pre-audit or audit process or;
- b) Appeals related to corrective action requirements issued to audited Operators related to Quality Assurance Audits or for appeals related to issuance of notices of violations to audited Operations.

Steps:

1. Owners or Operators of audited facilities are encouraged to resolve any uncertainties or disagreements with their Auditor during the audit process, or in the case of a notice of violation, with the Program Manager. A Senior Auditor and/or the Program Manager should be consulted for assistance in the interpretation and application of the Standards prior to an appeal being submitted. This is a pre-requisite to a formal appeal being considered by the Standards Appeals Committee.
2. If notification that the certification will be declined or withdrawn has been issued, Operators (“Appellant”) may launch a formal appeal by submitting a written brief to the Program Manager explaining the circumstances and rationale for appeal and include supporting documentation.
3. The Program Manager in consultation with a Senior Auditor will also prepare a brief explaining the circumstances and their rationale.
4. In the event of an appeal being launched the withdrawal of certification will not proceed until the appeal has been adjudicated.
5. These briefs will be forwarded to the Standards Appeals Committee.
6. The Standards Appeals Committee:
  - a. Shall be formed by CropLife Canada;
  - b. Shall consist of The AWSA Executive Director, the AWSA Program Manager and representative member(s) of the PAS Technical Committee and may include additional representatives at the discretion of CropLife Canada;
  - c. Shall be screened to ensure conflicts of interests do not exist;
  - d. Shall invite, if necessary, a Senior Auditor and the Appellant to submit any further information within five working days of receiving the appeal;
  - e. May review the relevant matter with a Senior Auditor and the Appellant either in person, via telephone or in writing;
  - f. May seek out additional regulatory or professional opinions to consider as part of the appeals process;

- g. Shall render a decision on the appeal as expeditiously as possible while respecting the principles of procedural fairness and public safety;
  - h. Shall report back to the Appellant on the status of the appeal every ten business days until a final decision is rendered;
  - i. The Appeals Committee will provide a final decision to the Program Manager for furtherance to the Appellant.
7. In the event that the withdrawal or declination of certification is confirmed upon appeal, the withdrawal of certification will be in effect at such a time as the operator receives formal correspondence from the Program Manager. Recertification will be accordance with established PAS Standards policies.

## **Part B: Appeals for Protocol Variance**

Periodically Audited Operations (Operators) may appeal for consideration for a variance to a specific Code protocol, either for a period of time or indefinitely. The decision for Protocol Variance lies with the PAS Technical Committee. The process to request a protocol variance is as follows:

Contact the Program Manager to complete the Variance Request Form to identify the following:

- a. The specific protocol(s) within the Standards that the variance request is applicable to;
- b. The current operational situation as it relates to the specific protocol(s) identified;
- c. Changes to the operational situation that are anticipated or planned with relative time required to complete;
- d. Rationale for the variance request (such as financial hardship, construction scheduling, technological change, operational efficiency, timeline extensions, etc.);
- e. Ruling from local building inspector, fire chief or other regulatory authority of relevance to the specific protocol(s) identified;
- f. Additional information that the Operator's site management feel would aid in the decision-making process;
- g. The Operator and Auditor may choose to consult the Program Manager for assistance in the interpretation and application of the Standards;
- h. The PAS Technical Committee shall render a decision as expeditiously as possible while respecting the principles of procedural fairness and public safety.
- i. Formal correspondence of the variance request decision will be provided by the Program Manager to the Operator seeking variance consideration within ten working days of receipt. If a decision has not be finalized after the initial ten business days a status update will be issued every ten business days until a final decision is rendered.

## **POLICY ON LAPSED CERTIFICATION**

Lapsed certification is defined as a withdrawal of certification resulting from:

1. Voluntary de-certification;
2. Failure to successfully re-audit before the expiry date;
3. Withdrawal of certification by AWSA management in accordance with established policies.

All operations require a full re-audit every two years to maintain certification status.

## **POLICY ON RENOVATION OF CERTIFIED OPERATIONS**

Periodically it is expected that operations will make changes to their operations. Any physical renovation made to an operation must comply with the Standards. If significant renovation or replacements are performed, affected protocols must be re-audited for compliance with the standards before use. The full operation will still be subject to a complete re-audit by their next scheduled re-audit date. Extenuating circumstances will be handled on an individual basis by AWSA management. Examples of renovations that would trigger an audit include but are not limited to:

- the addition or full replacement of a storage area or a structural renovation to the building(s) in which a storage is housed which impact the protocols.
- Significant extension of, or replacement of chemigation system components.

## **POLICY ON CHANGE OF OWNERSHIP**

If an operation changes ownership certification is transferable provided that:

1. Operator is to notify AWSA Program manager of change in ownership within 30 days of closing of purchase/transfer agreement;
2. Upon receipt of ownership change notification, the Program manager will forward an "Terms and Conditions" form to be signed and returned within 30 days of transfer to new ownership;
3. The operation must re-audit within 90 days of transfer to new ownership, regardless of the date of the last audit. The new audit date would set the frequency thereafter; and
4. If the ownership change does not involve a significant change of personnel, the operation may apply for a waiver from these changes of ownership requirements;
5. If the ownership change does not result in significant changes to the infrastructure relevant to this audit, the operation may apply for a waiver from these changes of ownership requirements.

## **POLICY ON DOCUMENTATION LANGUAGE**

A wide cross section of individuals work within the Canadian agricultural sector. Many of the protocols in this standard require workers to be able to read written materials as part of their job. Examples include (but not limited to) signage, safe operating procedures, and emergency response plans. These materials must be available in languages understood by all workers, or in cases of literacy limitations, training records must be available that evidence these materials have been explained and are understood by all workers handling pesticides.

## **POLICY ON LEASED SPACE**

Situations may arise where PA Operations maybe leased to third parties. Several scenarios are evident for the operation, management, and control of leased PA Operations.

In all scenarios the entity that has direct care and control over storage, handing and application of pesticides is required to be certified under the PAS Standards.

### **1. A certified Category 1 PA Operator leases ALL or PART of their space to a third-party grower but the PA Operator's staff operate the pesticide application process.**

- In this scenario the Category 1 PA Operator is already certified.
- Given the PA Operator's staff have care and control of the pesticide storage and application process on behalf of the third-party grower, no additional audit requirements present.
- In order for the third-party grower to receive PCP registered products labelled for greenhouse use, the name of the grower and the term of the lease must be provided to the AWSA Program Manager ([manager@awsa.ca](mailto:manager@awsa.ca)) so the master list of certified growers includes the third-party grower. The third-party grower will then be able to access PCP registered products labelled for greenhouse use for application on crops at the leased location for the duration of the leased period.
- The Lessor is responsible for maintaining biennial re-audit requirements.

### **2. A certified Category 1 PA Operator leases PART of their space to a third-party grower, but the third-party's staff operate the pesticide application process.**

- In this scenario the Category 1 PA Operator is already certified.
- Given the third-party's staff have care and control of the pesticide storage and application process a condensed audit is required (See matrix below for condensed audit requirements).
- In order for the third-party grower to receive PCP registered products labelled for greenhouse use, the name of the grower and the term of the lease must be provided to the AWSA Program Manager ([manager@awsa.ca](mailto:manager@awsa.ca)) so the master list of certified growers includes the third-party grower. The third-party grower will then be able to access PCP registered products labelled for greenhouse use for application on crops at the leased location for the duration of the leased period.
- For long term leases biennial re-audits are required. Both parties are responsible for maintaining biennial re-audit requirements.

**3. A certified Category 1 PA Operator leases ALL their space to a third-party grower and the third-party's staff operate the pesticide application process.**

- In this scenario the 3<sup>rd</sup> party has full control of the operation.
- A full audit, under the name of the 3<sup>rd</sup> party grower is required. Segments of the audit may include documentation from the lessor (i.e. Water management assessment). See matrix below for audit requirements.
- Certification will be issued in the name of the 3<sup>rd</sup> party grower.
- For long term leases biennial re-audits are required. Both parties are responsible for maintaining biennial re-audit requirements.

**4. A third-party grower leases an un-certified PA operation.**

- In this scenario the 3<sup>rd</sup> party has full control of the operation.
- A full audit, under the name of the 3<sup>rd</sup> party grower is required.
- Certification will be issued in the name of the 3<sup>rd</sup> party grower.
- For long term leases biennial re-audits are required by 3<sup>rd</sup> party grower.

**Audit Matrix for Leased Space  
Scenario type by Protocol**

#	Scenario 1	Scenario 2	Scenario 3	Scenario 4
<b>C1</b>	Regular audit	No additional requirements. Score as passed.	No additional requirements. Score as passed.	Full Audit applies. All program requirements apply.
<b>C2</b>	applies on regular audit	Audit requirement depends on who is responsible (lessor, lessee or both).	Audit applies	
<b>C3</b>	cycle for Lessor	Audit requirement depends on who is responsible (lessor, lessee or both).	Audit applies	
<b>C4</b>		Audit requirement depends on who is responsible (lessor, lessee or both).	Audit applies	

## DEFINITIONS

**Protected Ag:** Protected Agriculture (PA) refers to crops that are grown under structures such as:

- Greenhouses
- Warehouses
- Freight container growing operations.

**Category 1 Protected Ag Operation:** All PA operations, of any crop, using closed-loop chemigation systems. A closed system is one where any excess chemigation liquid delivered to the crop is captured via trough, drainage tile, or other similar conveyance system, rather than allowed to percolate into the ground. Warehouse production structures and freight container growing operations are excluded from Category 1.

**Category 2 Protected Ag Operation:** All PA operations, of any crop, using open chemigation systems where excess chemigation liquid is not captured. Warehouse production structures and freight container growing operations are included in Category 2 regardless of the status of the chemigation system.

**Chemigation system:** All components of the water irrigation system used to apply chemicals to the growing medium of a crop including feedwater and transfer piping, mixing and holding tanks, injectors/pumps, mixing, anti-siphon and backflow devices. Also referred to as fertigation or recirculation systems.

**Closed chemigation system:** A water irrigation system designed to not allow transfer of treated irrigation water outside of the operation as discharges into the environment or storm water management systems including ebb and flow benches, trough benches, flooded floor systems, chemigated water capture and return lines, filter and disinfecting systems, catchment tanks, active floor drains and waste water lines. Also referred to as recirculation systems.

**Containment:** Physical means that a site may employ to manage pesticide spills. This may include dyking, spill pans or baffled pallets as a means of pesticide spill containment.

**Pesticide mixing/loading area:** A defined area where pesticides may be dispensed and mixed into holding tanks and/or where pesticide containers are affixed/loaded onto pumps or injectors for transfer to tanks as part of a chemigation system.

**Pesticide storage area:** A defined area designed for the storage of pesticides that are not currently being used.

**PAS Technical Committee:** A committee formed as a sounding board to inform decisions related to the delivery of the standard. The committee may include any or all of the following: grower organization representatives, individual growers, government extension staff, crop protection industry representatives, ag-retail representatives, auditors. Membership will be defined by the Committee's Terms of Reference.

**PCP registered products labelled for greenhouse use:** Products registered under the *Pest Control Product Act* that have been approved specifically for greenhouse use. The Pest Management Regulators Agency's [label search tool](#) may be helpful in identifying these products.

**Warehouse:** The scope of the Code excludes warehouses for the definition of category 1 Protected Ag Operations. For the purposes of the Scope section, warehouse production structures are defined as fully enclosed buildings constructed of fixed walls, roofing and flooring that are used for indoor crop production using artificial sources for lighting. Greenhouses are excluded from this definition.

## **ACRONYMS**

AWSA: Agricultural Warehousing Standards Association

COE: Certificate of Excellence

ER: Emergency Response

PA: Protected Agricultural

PAS: Protected Agricultural Stewardship

PCP: Pest Control Product

PMRA: Pesticide Management Regulatory Authority

SDS: Safety Data Sheets

SOP: Safe Operating Procedure

# PROTOCOLS

## C: WATER ASSESSMENT AND EQUIPMENT MANAGEMENT (MANDATORY)

Protocol C1: Water Management Assessment	Compliance:
<p>Operation has undertaken a water-management assessment that has either been delivered or observed by an independent third party every six years that validates the facility's closed recirculation system.</p> <p><b>IF</b> a renovation or reconfiguration of the chemigation system occurs, a water management assessment must be undertaken and passed upon the modifications being completed.</p> <p>See accompanying Protocol C1 – Water Assessment Manual for further details.</p>	<p>Mandatory for PAS Certification</p>
<p><b>Audit Evidence:</b></p> <p>The auditor will review records on file to verify that a water-management assessment has been successfully completed within the last six years. This includes addressing any deficiencies noted as part of the assessment.</p>	

Protocol C2: Chemigation System Monitoring	Compliance:
<p>Operation has management plan in place to monitor its closed chemigation system to verify the system is working as intended.</p>	<p>Mandatory for PAS Certification</p>
<p><b>Audit Evidence</b></p> <p>The auditor will verify the presence of operation's management plan. Monitors could include:</p> <ul style="list-style-type: none"> <li>a) Nutrient monitoring in retention ponds as an indicator for pesticide levels.</li> <li>b) Pressure monitoring systems.</li> </ul> <p>Presence of a regulated wastewater discharge monitoring plan would be deemed equivalent. See supporting document for examples of sample plans and templates.</p>	

<b>Protocol C3: Chemigation System Maintenance</b>	<b>Compliance:</b>
<p>A formal process and schedule are in place to routinely inspect and maintain the closed chemigation system and its components (e.g., injectors, pump etc.) in accordance with manufacturer specifications. This includes a process for employees to identify deficiencies and a process for follow up and correction. The process should also include activities undertaken as year-end or crop-end maintenance.</p>	<p>Mandatory for PAS Certification</p>
<p><b>Audit Evidence:</b></p> <p>The auditor will verify the presence of:</p> <ul style="list-style-type: none"> <li>a) A documented plan for ongoing and year-end or crop-end maintenance,</li> <li>b) the operation’s inspection logs and records of actions taken to correct deficiencies,</li> <li>c) that annual or crop-end maintenance and cleaning has been completed.</li> </ul> <p>See supporting compliance assistance Manual (<a href="http://www.awsa.ca">www.awsa.ca</a>) for examples of various sample plans and templates.</p>	

<b>Protocol C4: Spill Response Plan</b>	<b>Compliance:</b>
<p>A plan is established to respond to and report major spills originating from the operation’s closed recirculation system. This could include leaks within the operation or leaks that result in contamination of stormwater water ponds and/or surface water sources.</p>	<p>Mandatory for PAS Certification</p>
<p><b>Audit Evidence:</b></p> <p>The auditor will verify the presence of a spill response plan. The plan shall contain at a minimum:</p> <ul style="list-style-type: none"> <li>a) A list of responsible persons including contact information,</li> <li>b) Steps to be taken to limit the extent of the spill and/or prevent ongoing discharge to surface water sources,</li> <li>c) The procedure and contact information for the appropriate regulatory body to report the spill if applicable.</li> </ul> <p>See supporting compliance assistance Manual (<a href="http://www.awsa.ca">www.awsa.ca</a>) for examples of various sample plans.</p>	

## COMPLIANCE ASSISTANCE

This section has been published by the Agrichemical Warehousing Standards Association to provide additional assistance, guidance, and examples to greenhouse operators on what is required to compliance with the Protected Agriculture Stewardship Standards

This section contains examples to be used to assist in developing policies and/or operating procedures. If these examples are used, operators must ensure operational personnel have been trained on YOUR policies and procedures. On a yearly basis operators' should review the contents and update where/when changes have occurred, especially the emergency response plan.

References to external public sources for compliance assistance with specific protocols are provided as guidance purposes only. Operators assume responsibility for compliance will all applicable regulations.

Examples provided in this section are for guidance purposes. These materials are not in any way intended to supersede or detract from any requirements contained in municipal, provincial or federal by-laws, regulations or legislation.

Note: These standards are applicable to the issuance of a compliance certification for the Protected Agriculture Stewardship Standards. The Standards and the audit thereof, is not an assessment of regulatory compliance. Operators are responsible for compliance with all regulatory requirements.

### Technical Questions

Technical questions or questions about interpretation of the Standards may be addressed to the AWSA Program Manager at [manager@awsa.ca](mailto:manager@awsa.ca) (1-877-236-2972) or by contacting one of the program auditors. Please visit [awsa.ca](http://awsa.ca) for regular technical updates.

## Section C: Water Assessment and Equipment Management

Protocol C1: Water Management Assessment	Compliance
<p>Operation has undertaken a water-management assessment by an approved third party every six years that demonstrates its closed loop chemigation system is closed - this may include a dye test or alternatives.</p> <p><b>IF</b> a renovation or reconfiguration of the chemigation system occurs, a water management assessment must be undertaken and passed upon the modifications being completed.</p>	<p>Mandatory for PAS Certification</p>

A separate document titled: Protocol C1 – Water Management Assessment is available on the website at [awsa.ca](http://awsa.ca)

Protocol C2: Chemigation System Monitoring	Compliance
<p>Operation has management plan in place to monitor its closed chemigation system’s wastewater discharge to verify the system is working as intended.</p>	<p>Mandatory for PAS Certification</p>

Each facility shall provide evidence of a protocol that monitors the integrity of the chemigation systems between Protocol C1: Water Assessments.

The following methods may be used to satisfy Protocol C2: Chemigation System Monitoring. Alternatives will be considered and should be submitted to Agrichemical Warehousing Standards Association (AWSA) at [manager@awsa.ca](mailto:manager@awsa.ca) for approval prior to utilizing same.

### I. NUTRIENT MONITORING

Record results from monthly or quarterly\* stormwater sampling results. Maintain a record of results throughout the year as evidence that a monitoring protocol has been implemented.

An example of a Nutrient Monitoring Log is provided on the following page.

\*Facilities in Ontario may follow the same stormwater sampling schedule as described in their ECA and utilize those results to satisfy Protocol C2. Sampling must be completed, at a minimum, quarterly.

An example sampling protocol from the [Ontario Ministry of the Environment, Conservation and Parks](#) is provided below:

*All samples and measurements [ .. ] are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.*

*Samples shall be collected at the following sampling points, at the frequency specified, by means of the specified sample type and analyzed for each parameter listed and all results recorded:*

**Sampling Station:** *Effluent from the stormwater management system during a discharge event, or in the stagnant storage facility in the vicinity of the outlet when no discharge is occurring and which is representative of the volume of stormwater as a whole.*

**Sampling Type:** *Grab*

**Sample Frequency:** *Monthly (year-round)*

**Sampling Parameters:** *Total Suspended Solid, Total Ammonia Nitrogen, Nitrate Nitrogen, Total Phosphorus, Ortho Phosphorus (Phosphorus as Phosphate), Zinc, Copper, Manganese, Iron, Molybdenum, Boron, Chloride, Sulphate, Potassium, Hardness, pH.*

*All samples collected [...] shall be analyzed by a laboratory accredited by ISO/IEC:17025 for the specified parameter or via an established protocol such as through Plant Products or Sun Parlour using the SGS Canada Inc., Lakefield's office.*

## II. ELECTRICAL CONDUCTIVITY (EC) MONITORING

Samples should be taken of both the source/background water and the discharge water (water entering the environment). If the EC readings of the discharge water are 0.2mS/cm above the background water, this could indicate a leak or cross-connection.

**Source/background water sample** is a sample that would be indicative of the surrounding bodies of water that are not influenced by your operation. This could be a rainwater sample or a sample of the ditch into which the stormwater pond discharges.

### Preparation

1. Prepare the following materials prior to testing:
  - a) Clean bottle(s) or cup(s) to obtain samples;
  - b) Calibrated Hanna or YSI pH/ Conductivity meter with temperature compensation;
  - c) Tools to open manholes, sump lids, etc.;
  - d) Flashlight;
  - e) Electrical Conductivity (EC) Log.

### Recording Procedure

Complete the following monthly or more frequently depending on results:

1. Obtain a background water and stormwater discharge sample using a clean bottle or cup. The sample size need not be more than 250mL.
2. Insert the Hanna or YSI pH/ Conductivity meter into the sample. Operate per manufacturer's instructions.
3. Record results in the Electrical Conductivity (EC) Monitoring Log.

- a. Describe sampling location;
  - b. Record conductivity meter reading in mS/cm.
4. Repeat steps 1 through 3, using a clean bottle, for each stormwater discharge location connected to each greenhouse being tested.
5. Maintain a record of results throughout the year as evidence that a monitoring protocol has been implemented. Sampling must be completed, at a minimum, quarterly

## SAMPLE NUTRIENT MONITORING LOG

**FARM NAME:** \_\_\_\_\_

**SAMPLE LOCATION:** \_\_\_\_\_

**SAMPLING DATE AND TIME**

PARAMETERS	UNITS	GH EFFL STORM WATER OBJECTIVE	SAMPLING DATE AND TIME							
Temperature Upon Receipt	°C	--								
Nitrate (as N)	as N mg/L	10.0								
Phosphorus (total)	mg/L	0.50								
Potassium (total)	mg/L	10.0								
Ammonia+ Ammonium (N)	as N mg/L	1.0								
Zinc (total)	mg/L	0.10								
Manganese (total)	mg/L	0.20								
Iron (total)	mg/L	1.50								
Copper (total)	mg/L	0.05								
Molybdenum (total)	mg/L	0.05								
Boron (total)	mg/L	0.50								
Chloride	mg/L	200								
Sulphate	mg/L	200								
pH	no unit	6.5-8.5								
Hardness	mg/L as CaCO3	---								
Total Suspended Solids	mg/L	30								

<b>Protocol C3: Chemigation System Maintenance</b>	<b>Compliance</b>
<p>A formal process and schedule are in place to routinely inspect and maintain the closed chemigation system and its components (e.g., injectors, pump etc.) in accordance with manufacturer specifications. This includes a process for employees to identify deficiencies and a process for follow up and correction. The process should also include activities undertaken as year-end or crop-end maintenance.</p>	<p>Mandatory for PAS Certification</p>

The auditor will verify the presence of

- d) the operation's inspection logs,
- e) that deficiencies are identified are corrected or a plan to correct them is underway.
- f) that annual or crop-end maintenance and cleaning has been completed.

**Examples:**

**Daily/weekly inspection**

The following could be embedded into an electronic labour management system as a daily or weekly task.

	Problem identified?	Locations	Corrective Actions	Date Corrected
Check drippers for leaks	Yes No	Examples: Section 2A, West block, etc.		
Check irrigations lines for leaks	Yes No			
Check for unbalanced or bowed troughs	Yes No			
Check trough ends for leaks	Yes No			

**Yearend maintenance**

The following should be inspected and maintained at the end of each crop cycle

	Locations	Additional corrective actions needed?	Date Completed
Troughs are cleaned to remove build up of lime or sediment	Examples: Section 2A, West block, etc.		
Aging or broken troughs are replaced			
Drippers are rigorous cleaned			
Irrigation lines are rigorously cleaned			

## Year start maintenance

The following should be inspected and maintained at the beginning of each crop cycle

	Locations	Additional corrective actions needed?	Date Completed
Ensure connections and seals are tight. Check for leaks before the start of production			
Replace plastic floor sheeting as needed to prevent leaks from entering the ground			

For more information talks to your local greenhouse extension support staff or your sector representative.

### References:

<http://www.omafra.gov.on.ca/english/engineer/facts/17-021.htm>

<b>Protocol C4: Spill Response Plan</b>	<b>Compliance:</b>
<p>A plan is established to respond to and report major spills originating from the operation’s closed recirculation system. This could include leaks within the operation or leaks that result in contamination of stormwater water ponds and/or surface water sources.</p>	<p>Mandatory for PAS Certification</p>
<p><b>Audit Evidence:</b></p> <p>The auditor will verify the presence of a spill response plan. The plan shall contain at a minimum:</p> <ul style="list-style-type: none"> <li>d) A list of responsible persons including contact information,</li> <li>e) Steps to be taken to limit the extent of the spill and/or prevent ongoing discharge to surface water sources,</li> <li>f) The procedure and contact information for the appropriate regulatory body to report the spill if applicable.</li> </ul>	

# BASIC SPILL RESPONSE PLAN\*

Business Name: \_\_\_\_\_

Site Address: \_\_\_\_\_

Directions to Facility: \_\_\_\_\_

## Response Actions in Case of a Spill:

- 1) If possible, shut off the source of the spill immediately.
- 2) Notify **spill contact person & other emergency contact(s)**: owner, manager etc.
- 3) Use absorbent materials, such as absorbent pads, floor sweeping compound or kitty litter to contain spills that are relatively small in nature and where the spilled chemical and its hazardous properties have been properly identified and assessed.
- 4) Use appropriate personal protective equipment depending on the spill material.
- 5) Cover/block any drains/catch basins in the spill area to prevent material from entering into the stormwater system, sanitary sewer system or septic system.
- 6) If possible, clean up the spill using absorbent materials. Collect these absorbent materials and treat as hazardous waste.
- 7) If the spill is large or otherwise uncontrollable, or poses a potential immediate hazard to human health and safety, call Emergency Response Agencies listed below.

## Emergency Contacts:

Spill Contact Person: \_\_\_\_\_ Phone #: \_\_\_\_\_

Owner: \_\_\_\_\_ Phone #: \_\_\_\_\_

Owner's Address: \_\_\_\_\_

Alternate/Manager: \_\_\_\_\_ Phone #: \_\_\_\_\_

## Emergency Response Agencies:

Fire/Police: **911**

Ontario Spills Action Centre: **1-800-268-6060**

Municipal Contact:

Local Hospital Contact:

## Location of Personal Protective Equipment (PPE) for Handling Spills:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## List of Hazardous Liquids that may Spill:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Employees should be trained to carry out the spill response actions set forth in this document, and that each employee be familiar with the site drawing that shows where hazardous materials/substances, spill kit(s), and all potentially susceptible and vulnerable drains/catch basins are located.

## List of Trained WHMIS/Spill Response Personnel

Name:	Date of Training:
_____	_____
_____	_____
_____	_____
_____	_____

**POST THIS PAGE AND A SITE DRAWING LOCATING ALL EMERGENCY EQUIPMENT AND EXITS IN A HIGHLY VISIBLE LOCATION**

\* This Basic Spill Response Plan may not be appropriate for all businesses. As operations and processes vary, please consult a Certified Industrial Hygienist or other qualified person to determine additional actions and/or PPE that may be required.