



# ENVIRONMENTAL MONITORING PLAN

for Imidacloprid

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## ASIAN LONGHORNED BEETLE ERADICATION PROGRAM Worcester, Massachusetts 2010

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**United States  
Department of  
Agriculture**

Animal and  
Plant Health  
Inspection  
Service

Plant Protection  
and Quarantine

Prepared by the  
Environmental  
Compliance Team



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## **General**

The United States Department of Agriculture (USDA) - Animal and Plant Health Inspection Service (APHIS) Directive 5640.1 (4/19/02) commits the Agency to a policy of fulfilling the mandates of the National Environmental Policy Act; the Endangered Species Act; the Federal Insecticide, Fungicide, and Rodenticide Act; and other statutes that require monitoring the effects of Federal programs on the environment. The monitoring described in this Environmental Monitoring Plan (EMP) supports these commitments for the Massachusetts Asian Longhorned Beetle (ALB) Cooperative Eradication Program.

Environmental sampling for residues of imidacloprid is proposed to validate the assumptions of the Environmental Assessments created for the program and to address specific concerns raised by the public. Imidacloprid is a systemic insecticide used as a treatment of ALB host trees at risk for infestation. ALB host trees are treated via ground or trunk injection based on the size of the tree. Targets identified for monitoring include groundwater, surface water, and non-target organisms. Monitoring will be conducted to determine if ALB Program systemic treatments of host trees result in the movement of imidacloprid beyond the immediate treatment area.

Samples collected as part of this plan will be reported to the ALB Program management in an annual report. If any residue samples seem unusually high, ALB Program management will be contacted immediately to determine what, if any, action may be needed to adjust Program operating procedures. This monitoring plan is a working document and will be updated as needed based on new information provided to the Environmental Compliance Team. It is designed to be a reference document for staff that will work with the Environmental Compliance Team to collect and document monitoring samples during the ALB eradication program. Training will be provided in early 2010 to field staff on implementing this monitoring plan. The monitoring described below is for 2010. The EMP will be updated annually.

## **Human and Environmental Health**

### **Objectives**

Monitoring for potential exposure is designed to:

1. demonstrate the effectiveness of ALB operational procedures in excluding or minimizing exposure of the public of the environment to Program-applied imidacloprid;
2. collect data which can be used to evaluate whether the assumptions used in the Environmental Assessments are valid estimates of potential exposure of the public and the environment to Program-applied imidacloprid; and
3. investigate any Program-related complaints or reports of adverse effects on public health, worker safety, environmental quality, or non-target species.

### **Methods**

#### ***Sensitive Site Inventory***

The Worcester ALB program will identify sensitive site prior to the initiation of chemical treatments. Sensitive sites are areas where the public may be exposed directly chemicals and

areas where there are specific concerns about potential impacts due to program activities. At this time, the only direct exposure potential for people could be via the consumption of water (dermal contact is not considered a significant route of exposure). The program will identify any ground or surface waters used as a source of drinking water in or adjacent to the proposed treatment area. Additional sensitive sites may include, but are not limited to, the location of apiaries.

The locations will be provided to the ECT. It is preferred that these lists be submitted in an electronic form, but they may also be submitted as a printed hard copy. Note the name and location of the water, the type of water (ground, surface, lake, etc.), and the distance and direction from the nearest treatment area. Prior to the start of chemical treatments, provide the list of sensitive sites to the ECT at the following address:

Dr. Robert Baca, USDA-APHIS-PPQ, 4700 River Road, Unit 150, Room 5A-04b,  
Riverdale, MD 20737 or via email to [robert.m.baca@aphis.usda.gov](mailto:robert.m.baca@aphis.usda.gov)

### ***Surface Water samples***

Surface water samples will be collected near the shore of ponds, lakes, or reservoirs, with priority given to any identified as a source of drinking water. PPQ personnel have identified several surface water stations that are representative of Worcester area watersheds (see attached map). About one week before the start of treatments in 2010, pre-treatment samples should be taken from chosen surface water sites. Additional samples should be collected at these stations approximately one week following treatments and then one, three, and six months later. Care should be exercised to ensure the water samples are free of turbidity and sediment. 4.8 liters of water will be collected for analysis from each sample station. (For minimum sample sizes for all sample types, see the last page of this document.) Following collection, samples will be kept on ice, in the dark, and remain chilled until they can be frozen for shipment. For more detailed information on sampling procedures, refer to *SOP EM-03 Collection of Water Samples*, available at [http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/emt/support\\_docs.shtml](http://www.aphis.usda.gov/plant_health/plant_pest_info/emt/support_docs.shtml).

### ***Groundwater samples***

Groundwater monitoring wells, installed as part of third-party subsurface environmental investigations, have been identified in the City of Worcester, and the Towns of Holden, West Boylston, and Shrewsbury. The ECT is working to obtain permission to gain access to these monitoring wells for residue sampling. Samples will be collected from the unconfined aquifer (i.e. water table) at chosen sites prior to the initiation of the spring 2010 programmatic chemical treatments, approximately one week following treatments, one month following treatments, and at two-month intervals thereafter.

Each time groundwater samples are collected, the volume of water in each well will be determined. If possible three well volumes will be purged and the well will be allowed to recharge before taking the sample for analysis. Samples will be obtained using well bailers, peristaltic pumps, or submersible pumps depending on the well location and depth to water. 4.8 liters of water will be collected for analysis from each well. Following collection, samples will be kept on ice, in the dark, and remain chilled until they can be frozen for shipment. For more detailed information on sampling procedures, refer to *SOP EM-14 Collection of Groundwater Samples*, available at [http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/emt/support\\_docs.shtml](http://www.aphis.usda.gov/plant_health/plant_pest_info/emt/support_docs.shtml).

### ***Leaf Litter Samples***

Whenever possible leaf litter samples will be collected each time ground- and surface water samples are collected. Leaf litter will be collected around the treated trees (no conifer needles) near and up-gradient of the monitoring wells. If no leaf litter is available, please note that on the 2060 Environmental Monitoring Form for the groundwater sample. Do not collect leaves that are on trees if no leaf litter is available. For more detailed information on sampling procedures, refer to *SOP EM-07 Collection of Vegetation Samples*, available at [http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/emt/support\\_docs.shtml](http://www.aphis.usda.gov/plant_health/plant_pest_info/emt/support_docs.shtml).

### ***Bee-Related Samples***

The Agricultural Research Service (ARS) of USDA is working cooperatively with APHIS to investigate the response of bee hives to imidacloprid treatments in the Worcester area. The ARS experiment is very thorough with strong analytical capabilities. Any monitoring conducted as part of this plan will be used to supplement the samples collected by ARS, and will not seek to duplicate their work.

If safe and practical, the Program should work with local beekeepers to collect bee and honey (from the hive) samples. As sampling through time is expected, it is optimal to work with beekeepers who will agree to multiple sampling events each year. Preference should be given to beekeepers with hives in proximity to treatments, but sampling is encouraged throughout the Worcester area.

Bee and honey samples should be collected from each hive. Samples should be collected prior to the start of spring treatments, approximately one week following treatments, one month following treatments, and at two-month intervals thereafter. A single sample of bees from a hive should comprise 25 or more bees. Healthy bees should be collected whenever practical, placed in a foil bag, and frozen prior to shipping (for details, see *SOP EM-08 Collection of Insect Samples*). A single honey sample from a hive should be 50 ml, and need only be kept dark prior to shipping. Freezing the honey may break the glass sample container.

### ***Monitoring for Incidents or Complaints***

Priority sampling will be conducted to investigate incidents of unknown origin involving non-target species or other unintended environmental or human health impacts possibly associated with Program-applied imidacloprid. Information about priority sampling can be found in *SOP EM-09, Priority (Emergency) Sampling*. Collect priority samples as soon as possible after the complaint, request, or problem is reported. Contact the ECT at (301) 734-7592 or 734-8247 to collaborate on a sampling plan, sampling methods, and types of samples to collect in order to optimize the investigation. If the incident occurs on a weekend, commence the investigation and sampling without delay, and contact the ECT as soon as possible on Monday.

Proper documentation of the incident, investigation, and samples is extremely important. When responding to priority incidents, send to the ECT all GPS maps showing the site, location where samples were collected, the nearest treatment area, and treatment history. Be sure to completely fill out all information on the APHIS 2060 forms with each sample. Be sure to provide an

incident/complaint report to the ECT, along with any other information that you feel will be helpful in resolving the incident (i.e. photos, observations at the site, etc.).

## **Endangered and Threatened Species**

There are no federally protected species in the eradication area at this time. Should the eradication area expand to areas where protected species become a concern, monitoring may be required and this monitoring plan will be updated accordingly.

## **Sample Processing**

### **Documentation**

Complete a separate APHIS 2060 form for each sample collected. (A blank copy is below for reference. Please only use original 2060 forms supplied by the Gulfport Laboratory for documentation.) Instructions for completing the APHIS 2060 forms are on the back of each form. All appropriate sections of the form should be completed. Samples should be marked as “routine” unless they were collected for a complaint or incident investigation where they should be marked as “priority.” For each sample, submit the *blue* copy of the APHIS 2060 form to the Center for Plant Health Science and Technology (CPHST) in Gulfport, Mississippi with the sample; the *white* copy of the form to CPHST in the sample shipping container but separate from the sample; and the *yellow* copy of the form (and any maps, photos, etc.) to the Environmental Compliance Team (ECT) in Riverdale, Maryland. The *pink* copy is retained by the sample collector.

### **Shipment of Samples**

Ship all samples using some form of overnight delivery. See SOP EM-17, *Packaging and Shipping of Samples* for details. Do not ship samples using USPS Priority Mail or standard ground service with other carriers. Overnight delivery allows the sample to stay frozen. Shipping any other way will take no less than two to three days and can ruin the samples. Be sure that all samples are frozen (except for honey), shipped in a cooler box (not a regular cardboard box), and kept cold during shipment. To keep samples cold, ship samples on ice. *Do not use dry ice*, since it will cause the sample containers to crack or break. Either use “blue ice” containers (the reusable plastic containers with the blue liquid/gel inside) or contained regular ice (that is, seal the ice in zip-loc bags). Unsealed ice will melt and leak during shipment, causing unnecessary concern when received at the laboratory.

### **Supplies**

Most supplies for monitoring are ordered through the CPHST Gulfport Laboratory, although certain supplies are obtained locally. A checklist for ordering supplies is located below. This checklist is used by all APHIS pest control programs, and several of the supplies listed do not pertain to the ALB Program. The Gulfport Laboratory prefers that supply orders be faxed to them using the numbers listed on the checklist rather than leaving a voice message for orders.

## **Responsibilities**

### ***APHIS-PPQ Environmental Compliance staff in Riverdale, Maryland will:***

1. Review and interpret field and pesticide residue data from the sample collectors and the laboratory. Contact the sample collector for clarification as soon as possible if any field data is incomplete or unclear. Notify the Program Director or Manager immediately if any residue data is unexpectedly high in value.
2. Provide training, clarification, and interpretation on how to implement the Environmental Monitoring Plan.
3. Submit a comprehensive interpretive report to the Program Director and the National Coordinator within 60 working days of receiving all of the Program's field data and sampling results.

### ***APHIS-PPQ Center for Plant Health Science and Technology Laboratory staff in Gulfport, Mississippi will:***

1. Prepare and ship supplies required for the collection, stabilization, and shipment of environmental monitoring samples.
2. Provide training on methods for collecting, handling, preserving, and shipping samples.
3. Respond to requests for additional information by field personnel when special sampling requirements occur.
4. Analyze monitoring samples according to standard operating procedures for imidacloprid.
5. Complete analyses and report results on the following schedule:
  - a. Within 23 working days after receipt, complete analyses of all routine samples and send results to the ECT.
  - b. Within 5 working days after receipt, complete analyses of all priority/emergency samples and send results to the ECT.
  - c. Contact ECT if the projected completion schedules need to be extended due to sample load or laboratory instrument problems.
6. Forward copies of all environmental monitoring forms and any attached documentation to the ECT each week via overnight mail.

### ***APHIS-PPQ Field Personnel or Cooperators, will:***

1. Ensure that sufficient resources from the Program are allocated for completing the monitoring activities described in the Environmental Monitoring Plan (EMP).
2. Follow instructions in the EMP and referenced SOPs to develop a plan for sample collection and documentation, including:
  - a. Collection of the type and number of samples recommended in the EMP.
  - b. Completion of a separate APHIS 2060 form for each sample that is collected.
  - c. Providing all the information necessary to document the samples. Send all supporting documentation, including a copy of the appropriate APHIS 2060 forms to the ECT. Send all samples and appropriate APHIS 2060 forms to the laboratory. Ship all samples and supporting documentation in accordance with protocols and procedures.
  - d. Notification of the laboratory prior to shipping any priority, spill, or unusual (i.e. other than water, insect, or vegetation) samples.

## ENVIRONMENTAL MONITORING SUPPLIES CHECKLIST

<b>SUPPLIES TO BRING EACH TIME YOU GO TO A SAMPLING SITE</b>			
Monitoring plan/SOP's	Obtain from ECT	Thermometer	
Field log notebook		Ice chest/wet or blue ice	Obtain locally
Compass		Baby wipes	
Wind gauge		2060 monitoring forms	
Indelible marker		Packing/strapping tape	

<b>A.R.S.E. (Run-off Sampling)</b>		<b>Dye Cards</b>	
Plexiglas cover		Oil sensitive dye cards	
8"x 8" mesh screen		Water sensitive dye cards	
Tent pegs/nails		5' bamboo poles/stakes	
Funnels attached to caps		Paper/alligator clips	
500 ml bottles		Tacks	
4" PVC pipe, 14" long		4" x 4" plastic bags	
Post hole digger		12" x 12" plastic bags	
Pea gravel		Tweezers/forceps	
Large rocks/bricks		disposable gloves	
Bamboo pole/flagging tape		<b>Water Samples</b>	
collapsible cubitainer		Dissolved oxygen kit	
Sodium sulfate (small vials)		collapsible cubitainer	
pH paper/pH meter		Sodium sulfate (small vials)	
Sulfuric acid (squeeze bottle)		pH paper/pH meter	
Styrofoam 'coffin'		Acid or base (squeeze bottle)	Obtain locally

<b>Vegetation/Fish/Insect Samples</b>		<b>Sediment Samples</b>	
Pruning sheers/scissors		Dredge tied to strong rope	
Aluminum foil envelopes		3 gallon galvanized pail	
Strapping tape		Hand trowel	
		3" mesh screen	
		Aluminum foil envelopes	

Soil Samples		Swab/Wipe Samples	
Soil core sampler		3" x 3" sterile cotton pads with resealable plastic bag	
3 gallon galvanized pail		Metric ruler	
Hand trowel		Pencil	
3" mesh screen		Disposable gloves	
Aluminum foil envelopes		Isopropyl alcohol	Obtain locally
Baby wipes			

Neat (Pure) Chemical Formulations		Miscellaneous Supplies	
Amber glass bottle		Labels	
Parafilm		Styrofoam coolers/mailers	
Small mailing tubes		Freezer	Obtain locally
Cat litter/packing material		2 oz bottle for honey samples	
Disposable pipette		Resealable plastic bags:	
Pipetting bulb		4" x 4"	
Disposable gloves		6" x 6"	
Protective eyewear		8" x 8"	
		12" x 12"	

**Program:** \_\_\_\_\_

**Requested by:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Phone:** \_\_\_\_\_

**Address:** \_\_\_\_\_

To order supplies, indicate the quantity of each items needed. Fax a copy of this form to CPHST Gulfport Lab at 228-822-3209 or 228-822-3137. If fax machines are not working, leave a message with the CPHST Gulfport Lab supplies manager at 228-822-3106. Please realize that it may be difficult to completely fill order for large quantities of materials.

**Note:** This is not an exhaustive supply list...items that are not listed here may be available through CPHST Gulfport Lab. Not all supplies listed above are required for all pest control programs.

**PRESS HARD,  
YOU ARE MAKING 4 COPIES**  
See Guidelines on back of this form.  
Use a separate form for each sample collected.

# Environmental Monitoring Form



1. Program		2. State	3. County		4. Site Identification			5. Date Collected MO-DA-YR		6. Time Collected		
7. Sample Description			8. Location DISTANCE (FL)   DIRECTION		9. Pesticide		10. Formulation		11. Application Method   Rate		12. Sample Type <input type="checkbox"/> Priority <input type="checkbox"/> Routine	
13. Dates Treatment Applied												
Month	Day	Month	Day	Month	Day	Month	Day	Month	Day	Month	Day	
14. Total Trtmts	15. Time of Last Treatment	16. Soil Type (from county soil survey)			17. Land Slope (Degrees)		18. Last Rainfall MONTH   DAY   AMT.			19. Wind SPEED   DIRECTION		20. Rel. Hum.
21. Water Body Type (Pool, Pond, Reservoir, Well, Stream, etc.)			Size (Acres or Width)	Depth (Feet)	Velocity (Fl./Min.)	Temp. (°F)	22. Water pH (include decimal pt.) Before   After		Dissolved Oxygen (mg/L)	23. Average Air Temp. (°F)		
24. Remarks (e.g. Sketch of site, unusual occurrences, additional information unique to sample, etc.)										25. Lat.		
										Long.		
26. Name of Collector (type or print)					27. Initials		28. Telephone Number of Collector					
<b>FOR LABORATORY USE ONLY</b>												
29. Date Sample Received		30. Date Analyzed			31. Results			Public reporting burden for this collection of information is estimated to average 0.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs Office of Management and Budget, Washington, D.C. 20503.				
32. Laboratory Accession Number		33. Condition of Sample on Receipt										

APHIS FORM 2060 (OCT 99) replaces APHIS FORM 2060 (MAR 94) which is obsolete.

PT. 1 LABORATORY

Front page of APHIS Form 2060, the Environmental Monitoring Form.

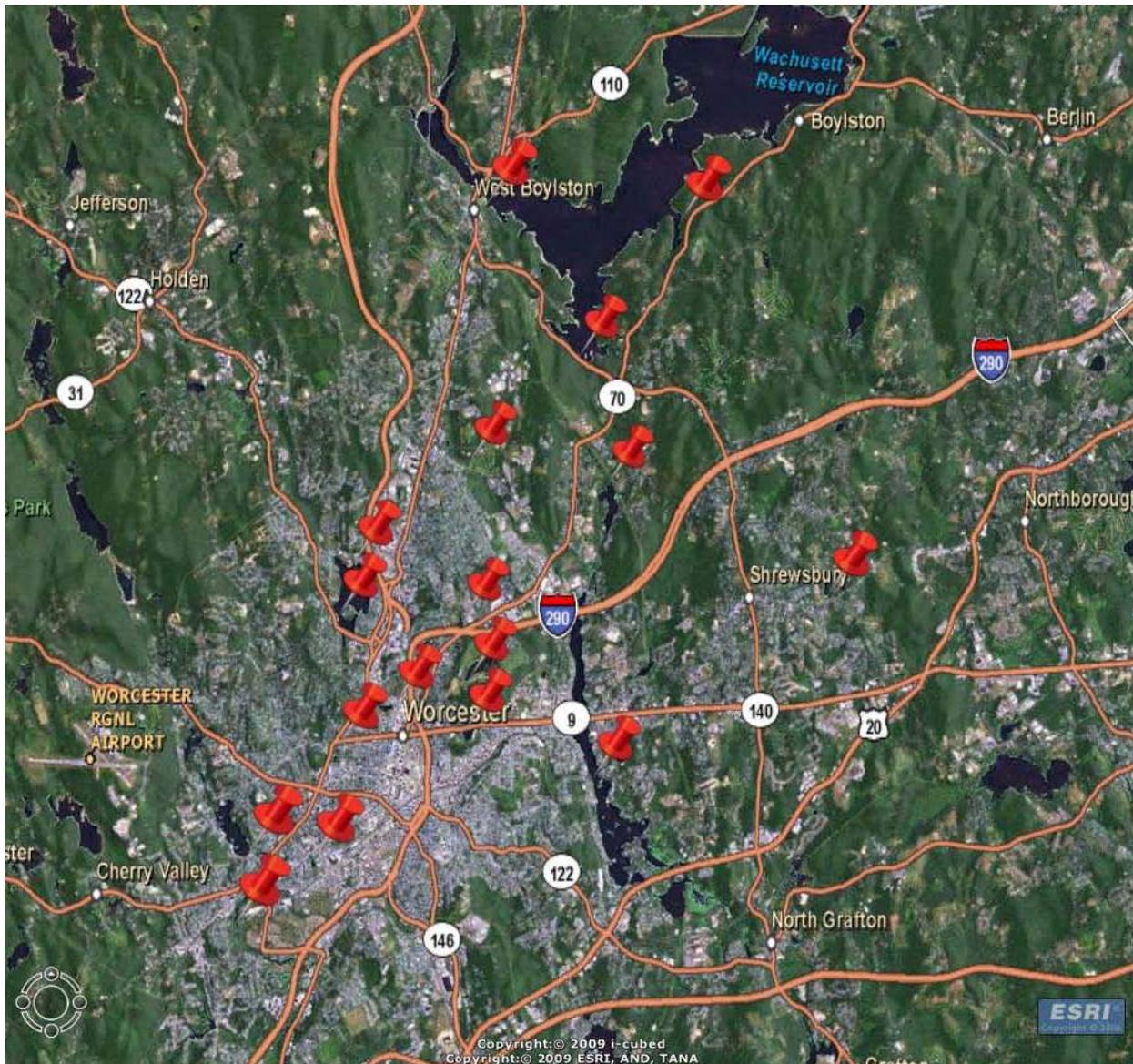
## Guidelines

Every sample must be accompanied by a completed APHIS Form 2060. The present guidelines are generic and will be superseded by specific instructions included in an Environmental Monitoring Plan for a particular program or operation. If you have any questions about how to fill out the form, or any other questions about monitoring, please call the Environ. Monitoring Team at 301-734-7175.

1. **Program:** Enter the most accurate description, or a commonly used acronym, of program.
2. **State:** The two letter postal abbreviation of the state in which the sample was collected.
3. **County:** The county in which the sample was collected.
4. **Site ID:** Assign a number which uniquely identifies the site (can be alphanumeric).
5. **Date Collected:** The date that the sample was collected.
6. **Time Collected:** The time the sample was collected, using a 24 hour clock.
7. **Sample Description:** Enter what the sample is (e.g., soil, sediment, water, grass, dye card, grasshoppers).
8. **Location:** The distance (in feet) and direction (e.g., 242 degrees as measured with a compass) from the nearest point of the treatment block to the site where the sample was collected.
9. **Pesticide:** The name of the pesticide for which the laboratory should analyze. If analyses for more than one pesticide are necessary, list the other pesticides in the Remarks block.
10. **Formulation:** The formulation of the pesticide used (e.g., emulsifiable concentrate, wettable powder).
11. **Application:**
  - Method:** The method used to apply the pesticide (e.g., fixed wing aircraft, highboy, backpack sprayer, drench).
  - Rate:** The rate at which the pesticide is applied (e.g., pounds a.i. per acre).
12. **Sample Type:** Check off the appropriate box: Sample types are usually defined as follows:
  - Priority:** Samples collected to respond to any reported or observed adverse impact (e.g., bird kill, fish kill, public health concern, property damage).
  - Routine:** All samples not considered priority samples.
13. **Dates Treatment Applied:** The dates treatments applied. If more than 8, then list additional in Remarks block.
14. **Total Treatments:** Enter the total number of treatments.
15. **Time of Last Treatment:** The time of day that the last treatment was completed (use 24 hour clock).
16. **Soil Type:** Enter the type of soil (e.g., sandy loam).
17. **Land Slope:** Enter the slope, measured from the treatment block to the sample collection site (positive degrees above horizontal for an incline or negative degrees below horizontal for a decline).
18. **Last Rainfall:** The date and amount of the last rainfall before the sample collection.
19. **Wind:** The speed (mph) and direction (e.g., 320 degrees as measured with a compass) from which the wind was coming at the time of the last treatment.
20. **Rel. Humidity:** The relative humidity of the air, measured as a percentage (e.g. 75%) at the time of the last treatment.
21. **Water Body:**
  - Type:** Examples; pool, lake, river.
  - Size:** Surface area (acres) or width (feet).
22. **Water:**
  - Depth:** Average depth (feet).
  - Velocity:** At the sample collection site (feet per minute).
  - Temp.:** Water temperature (°F).
  - pH Values:**
    - Before:** The pH of the water sample.
    - After:** If a pH adjustment is required to stabilize the sample, enter the pH of the sample after the adjustment.
  - Dissolved Oxygen:** Enter the oxygen content of the water sample.
23. **Average Air Temp.:** Enter the air temperature at the time of the last treatment.
24. **Remarks:** Additional information concerning the location of the sampling site (sketch of the site or attach a map), weather conditions (additional wind speeds and directions, gusts, cloud cover), circumstances relevant to the results of the sample analysis, and who to report results to if different from collector.
25. **Latitude and Longitude:** Coordinates of sampling site as determined by GPS unit.
26. **Name of Collector:** Print submitter's name.
27. **Initials:** Submitter's initials in script.
28. **Telephone Number of Collector:** Include area code.

## Distribution

- Laboratory (original)** - submit to the USDA-APHIS National Monitoring and Residue Analysis Laboratory (NMRAL), 3505 25th Avenue, Building 4, Gulfport, Mississippi 39501, c/o Environmental Monitoring Coordinator.
- Headquarters (yellow copy)** - mail to: USDA-APHIS-PPQ, 4700 River Road, Unit 150, Riverdale, MD 20737, along with any attached maps or other documentation.
- Collector (pink copy)** - the collector will keep this copy on file for reference.
- Sample (blue copy)** - package with the individual sample so that if several samples are being shipped in the same container, each form will be associated with it's corresponding sample.



Potential surface water sampling stations. Contact the Environmental Compliance Team at 301-734-7592 for location details.

Minimum sample sizes required for imidacloprid analysis for a single sample of:

Leaves, twigs, bark	50 grams
Soil, sediment	50 grams
Sap, honey	50 ml
Water	4800 ml
Bees	25 bees

(Smaller samples may be possible, but are less reliable. If the minimum sample size is not available, collect as much as possible for the sample.)