



INFORMATION MANUAL FOR IMPLEMENTING POULTRY BIOSECURITY

Updated July 2018



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Comments and Feedback

Comments and feedback are welcomed and may be sent to USDA National Preparedness and Incident Coordination Center (NPIC) and the CFSPH at ISU at the following website:
<http://poultrybiosecurity.org/contact-us>

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Target Audience

This Information Manual for Implementing Poultry Biosecurity and corresponding Self-Assessment Checklist is a guidance document highlighting best biosecurity practices for poultry sites of varied sizes and management types that hatch and/or raise poultry, and are not currently known or suspected to be infected with avian influenza (AI). For the purposes of this manual, avian influenza includes both low pathogenicity AI (LPAI) and high pathogenicity AI (HPAI). These materials reflect the items included in Standard E- Biosecurity Principles within the National Poultry Improvement Plan (NPIP) Official Program Standards. The Standard E- Biosecurity Principles can be found at: <http://poultryimprovement.org/documents/StandardE-BiosecurityPrinciples.pdf>. This manual is for flocks that participate in the NPIP, which include, but are not limited to, broilers, turkeys, egg layers, commercial waterfowl, and upland gamebirds, that meet specified flock size requirements. The biosecurity principles in this manual can also apply to flocks of other sizes and management types. In some operations (such as free range and/or backyard poultry operations), it may be difficult to implement each principle, thus affecting the ability of that biosecurity item to mitigate disease risk. All individuals delivering to, servicing, or working on the poultry operation should follow this guidance. These biosecurity procedures were designed to minimize the chances for avian influenza virus to be introduced to a production site. They will also reduce the chances for other disease agents to enter the site. The biosecurity procedures described here are the minimum recommended procedures. Increased standards may be required by specific sites, or during an AI outbreak.

Introduction

The poultry industry is critical to the United States (U.S.) agricultural economy, and poultry health and well-being are essential to food security. An outbreak of high pathogenicity avian influenza can have devastating effects, as demonstrated by the 2014-2015 HPAI outbreak that affected over 200 poultry sites primarily located in the upper Midwest, requiring the destruction of nearly 50 million birds and with direct costs of nearly \$1.6 billion. An epidemiological study indicated that efforts to limit disease spread were largely ineffective; thus, the biosecurity of poultry facilities needed to be strengthened to reduce the risk of future infections. To assist poultry producers in implementing effective biosecurity plans, the Animal and Plant Health Inspection Service (APHIS) worked with State, academic, and industry experts to develop this information manual and corresponding self-assessment checklist.

To prevent an AI outbreak, it is the responsibility of everyone involved in raising a flock to keep poultry flocks from becoming infected by focusing on biosecurity they can control on their premises. Biosecurity approaches include both structural and operational components. Structural biosecurity refers to the physical construction, design, and maintenance of a facility to prevent entry of disease vectors and facilitate compliance with operational biosecurity practices. Operational biosecurity involves risk assessments and mitigation of risk through management practices, including implementation of and compliance with standard operating procedures (SOPs) designed to prevent the introduction of the AI virus onto a premises. The recommendations in this document focus on implementing operational

biosecurity; however, poultry producers should consider both operational and structural biosecurity strategies to reduce their overall risk of AI and other diseases.

This document emphasizes the elements of biosecurity that are believed to be most critical. Based on expert opinion, epidemiological evidence, and experience in recent outbreaks, the highest risks for AI virus introduction are personnel who enter the poultry buildings, shared equipment and shared crews, procedures for disposal of dead birds, and manure management. These elements are the highest priorities for biosecurity. However, all of the biosecurity steps are important to prevent disease introduction.

APHIS urges producers to develop a site-specific plan to enhance operational biosecurity immediately. In addition, effective biosecurity requires compliance; producers need a system in place to verify that biosecurity practices are being followed. State Animal Health Officials or the manager of the destination site may also want to review the premises biosecurity plan to determine if acceptable biosecurity measures have been implemented.

Lastly, although certain types of AI may be transmissible between birds and humans, the focus of this information manual and the corresponding self-assessment checklist is on preventing AI in poultry. Protection of personnel from zoonotic infection is outside the scope of this manual; selected educational resources can be found in [Appendix M](#).

Scope of Biosecurity Plan

Begin by defining the site, clearly describing its layout and features like private houses, ponds, forests or public roads. Describe the types of animals on the premises including all types of poultry and other species, and describe poultry houses or other areas where these animals are housed or raised. Structures involved in the operation of the site need to be included in the biosecurity plan (e.g., manure sheds, composting areas, egg rooms, etc.). It is best to consider each farm with poultry at non-adjacent locations or multiple locations that must be accessed via a public road as a separate site, with a separate Premises Identification Number (PIN), and therefore, a separate biosecurity plan. Sites under common ownership and/or management (e.g., production sites within a complex, or complexes managed by the same company) may follow a common biosecurity program, and thus these site-specific plans may have significant overlap. When a farm becomes infected, all locations with the same PIN number are likely to be considered to be infected at the discretion of the Official State Agency. A PIN includes a valid 911 address and a set of matching coordinates (latitude and longitude) reflecting the actual location of the animals on the site. Request a PIN from the office of your State Animal Health Official.

Other businesses, animal or non-animal related, operated from the same site should also be accounted for in the biosecurity plan. Some animal- or animal product-related examples could include sale or distribution of compost or a petting zoo. Non-animal examples could include seed sales, daycare centers, or repair shops. Keep this in mind when completing the checklist and writing the biosecurity plan.

1. Biosecurity responsibility

The Biosecurity Coordinator is responsible for the development, implementation, maintenance and ongoing effectiveness of the biosecurity program. Depending on the type and size of poultry operation, the Biosecurity Coordinator's responsibility could be at the farm, production site, production complex, or company level. The Biosecurity Coordinator should be knowledgeable in the principles of biosecurity. The Biosecurity Coordinator, along with the personnel and caretakers on the farms and production sites, are responsible for the implementation of the biosecurity program. The Biosecurity Coordinator should review the biosecurity program at least once during each calendar year and make revisions as necessary.

Designated Biosecurity Coordinator

The designated Biosecurity Coordinator should be able to develop and support biosecurity procedures effective in protecting the poultry on the operation from avian influenza virus infection. The Biosecurity Coordinator should be familiar with the current structural and operational biosecurity of the production site (and integrated system, if applicable). The Biosecurity Coordinator for a small independent producer may be the owner of the operation. If the Biosecurity Coordinator is not a poultry veterinarian, the individual should consult with a veterinarian who is experienced in poultry biosecurity practices and is familiar with the layout, daily procedures, and health status of the poultry on the production site when developing the biosecurity plan. This Manual is intended to assist the Biosecurity Coordinator in developing site-specific biosecurity plans and in implementing or supporting the training of employees and other personnel who enter the site. The Biosecurity Coordinator may need to revise these materials or develop supplemental information to address specific sites or integrated systems. Integrated systems may have a Biosecurity Coordinator for the system with a designated manager on each site responsible for ensuring that biosecurity SOPs are followed. The on-site manager is responsible for ensuring that the biosecurity practices for that location are followed on a daily basis. It is important that the Biosecurity Coordinator, and any on-site designee(s), have the authority to take corrective action if protocols are violated or need to be revised. An alternate contact person for the site should be identified in the event that the primary Biosecurity Coordinator is unavailable. The Biosecurity Coordinator and designee(s) should post their contact information in an area where it can easily be found.

The responsibilities of the Biosecurity Coordinator include:

- Developing and supporting the implementation of an effective, site-specific biosecurity plan,
- Overseeing and documenting that all personnel regularly entering the site have been trained in biosecurity protocols,
- Taking corrective action, as needed, when biosecurity protocols are violated, and
- Reviewing the biosecurity plan at least once per calendar year.

Implementation of the Biosecurity Program

The biosecurity plan should address how the production site implements the biosecurity protocols described in this document. If other species (cattle, pigs, sheep, goats, etc.) are housed on the site, the biosecurity plan should include how these species are managed to maintain the biosecurity of the poultry flock (including movement of personnel, equipment, animals, etc.). If possible, sites with other animals should be managed as multiple premises, with a separate biosecurity plan for each species.

The site-specific biosecurity plan should include a site map(s) (satellite images are preferable) labeled with the following:

- Entrance(s) to site
- Perimeter Buffer Area (PBA) and PBA Access Point(s)
- Line of Separation (LOS) and LOS Access Point(s)
- Load-in/out location(s)
- Cleaning and disinfection (C&D) station(s),
- Designated parking area outside the PBA (for vehicles that will not be C&D)
- Carcass disposal/pickup location and carcass removal pathways, and
- Vehicle movement pathways (animal transport vehicles, deliveries, etc.).

If non-essential items are delivered to the site, the site map should indicate the designated area for delivery of these items. If non-essential items are to be delivered to an off-site location (e.g., post office, residence), this should be clearly indicated in the biosecurity plan and instructional signs posted at the site entrance.

Instructions for creating a site map for a biosecurity plan can be found in [Appendix A](#).

The biosecurity plan should be accessible to individuals frequently entering the operation, Responsible Regulatory Officials, or the attending veterinarian upon request.

Annual Review

The Biosecurity Coordinator should document that he/she reviews the plan at least once each calendar year, or whenever the production site goes through a change (expands, adds a new aspect of the business, etc.) which impacts biosecurity, or whenever the “Self-Assessment Checklist for Implementing Poultry Biosecurity” is updated/changed (visit www.poultrybiosecurity.org). The Biosecurity Coordinator should continually adapt the plan to address changing risks or recommendations. Due to the inherent variation between production sites, biosecurity plans should be created specifically for every site.

The Biosecurity Coordinator should include supplemental information within the site-specific biosecurity plan to implement during periods of heightened risk, and should define what constitutes a “period of heightened risk,” such as a local HPAI outbreak, and how heightened risk will be communicated to those working at the site. If a period of heightened risk is in effect, the Biosecurity Coordinator should review (and document this review) the biosecurity plan to ensure biosecurity measures are sufficient to protect poultry on the site.

If all checklist items are not “in place” after completion of the written plan, the Biosecurity Coordinator or designee must be capable of implementing or supporting the implementation of each item immediately if HPAI is diagnosed in the U.S. According to the USDA APHIS HPAI Interim Rule, effective February 9, 2016, in the event of an HPAI outbreak indemnity claims will be denied if the non-exempt owner or contractor does not provide a statement to APHIS that at the time of detection of HPAI in their facilities, they had in place and were following a biosecurity plan. Additional measures may also be required for consideration for indemnity. More information on the Interim Rule can be found at: <https://www.gpo.gov/fdsys/pkg/FR-2016-02-09/pdf/2016-02530.pdf>.

2. Training

The biosecurity program should include training materials that cover both farm site-specific procedures as well as premises-wide and/or company-wide procedures as appropriate. All poultry owners and caretakers that regularly enter the perimeter buffer area (PBA) must complete this training. The training must be done at least once per calendar year and documented. New poultry caretakers should be trained at hire. Training records should be retained as stated in Title 9-CFR §145.12(b) and 146.11(e).

Encouraging Compliance through Training

Achieving thorough compliance with biosecurity protocols by farm personnel and visitors is an ongoing challenge for poultry production facilities. The biosecurity plan can only be effective if EVERYONE on the operation follows it, all of the time. Compliance with the biosecurity practices should become part of the culture of the facility. Poor compliance is usually related to a lack of knowledge or understanding of either the biosecurity protocols, a lack of consequences for non-compliance, or a company culture of inconsistent application of the principles of biosecurity.¹

The Biosecurity Coordinator, on-site manager, caretakers and other personnel on farms and production sites should be trained upon hire, and then at least once per calendar year to ensure their awareness of the biosecurity measures necessary to keep AI out of the flock(s). There are many resources available on the Poultry Biosecurity website (www.poultrybiosecurity.org). The Biosecurity Coordinator, designee, or the on-site manager needs to inform individuals entering the operation of the biosecurity measures they need to follow in a language they understand. Individuals should be made aware of the biosecurity concepts and procedures that apply to their specific areas of responsibility.

All individuals entering a biosecure premises should understand how to:

- ☐ Contact the Biosecurity Coordinator(s);
- ☐ Respect the Perimeter Buffer Area (PBA), including parking in the appropriate location;
- ☐ Enter the PBA, if required, following arrival and biosecure entry requirements;
- ☐ Cross the Line of Separation (LOS), if required, following biosecure entry requirements; and
- ☐ Perform biosecurity measures for their specific job duties.

Essential personnel (managers, caretakers, etc.) should ALSO:

- ☐ Understand the importance of biosecurity;
- ☐ Review the entire biosecurity plan;
- ☐ Review the labeled site map;
- ☐ Know who to report to if they see someone not complying or something preventing compliance; and
- ☐ Recognize the consequences for not complying with biosecurity protocols.

Contract crews, service personnel, consultants and visitors should receive information about biosecurity expectations and site-specific practices prior to arrival at the facility by appropriate written or verbal means. Communication of protocols may involve calling, emailing, texting, or faxing information to individuals prior to arrival or communicating with these individuals upon arrival, prior to entry. One example might include a copy of a memo sent to the feed company with a map of the site showing where

feed trucks are to drive and stating that feed truck drivers are to wear disposable footwear and disposable gloves or apply hand sanitizer when they enter the PBA to open feed bins.

Training Materials

The Biosecurity Coordinator must ensure that employees receive proper training and resource materials and that they understand the steps required for effective biosecurity. All new employees should receive comprehensive training before they begin work. Tools that can be used to educate farm personnel and visitors include group training sessions and demonstrations of proper practices, one-on-one training sessions, interactive modules/animations through online training, narrated PowerPoint presentations and videos, handouts/pamphlets/brochures, detailed pictures, and signage in the appropriate language(s). Individuals should be encouraged to ask questions about the training received. Many training materials can be found at www.poultrybiosecurity.org. If printed materials are given to employees, consultants, and service personnel, these individuals should be given time to read the materials and encouraged to ask questions.

Documenting Training

Document training sessions for essential personnel and all communication with other individuals arriving on the site (an example Training Documentation Log can be found in [Appendix B](#)). These records should be kept for at least 3 years.

- Example: After a training session, have all attendees sign and date a document and include a copy of the training agenda/content reviewed.
- Example: Keep a copy of the document sent to off-site individuals describing where and how to enter the PBA, how to cross the LOS at a LOS Access Point and their tasks (remain in cab, exit wearing protective boots/gloves, etc.) and have them sign it upon first arrival.

The Biosecurity Coordinator should continually emphasize the importance of biosecurity protocols for AI prevention. Communication of biosecurity is vital to any operation to protect poultry health. Individuals should be encouraged to communicate with the Biosecurity Coordinator if they have questions or concerns. There should be routine verification procedures in place to ensure that biosecurity training has been completed and biosecurity practices are being followed.

3. Line of Separation (LOS)

The Line of Separation (LOS) Concept

The Line of Separation (LOS) is established as a “last line of defense” to isolate poultry from potential sources of AI infection. For indoor-raised poultry, the LOS generally includes the building walls separating the birds from the outside plus a marked line in the entry room to the poultry house. For indoor-raised poultry with access to the outdoors, such as an enclosed porch with a roof and mesh walls, the LOS may be extended from the walls of the building to include the walls of the outdoor pens. For poultry with non-enclosed outdoor access, such as pastured poultry, natural or man-made obstacles which contain the poultry within a designated area may constitute the LOS.

In addition to providing a barrier to human entry, the LOS excludes wildlife and other animals from crossing the LOS and contacting poultry. Barriers should be intact and maintained to keep wild birds, their feces and feathers out of the facility, as these materials have been shown to be sources of

environmental contamination.^{2,3} More information on excluding wildlife can be found in [Section 6: Wild Birds, Rodents, and Insects](#).

A site may have as many Lines of Separation as there are buildings. A group of buildings connected by enclosed walkways may all be within the same LOS. See [Figures 1 and 2 in Appendix D](#) for examples of how the LOS might be established. The LOS should be included on the site map.

LOS Access Point

Each house or group of connected houses should establish a single-entry crossing to the bird side of the LOS thereby controlling and implementing a biosecure entry and exit procedure for personnel and equipment to cross the LOS. The LOS should be clearly marked (such as with tape or paint, walls and doors, etc.) and have appropriate signage in language(s) understood by all entering.

The following minimum essential components that should be provided at the LOS Access Point include:

- A visually defined LOS
- An area for personnel to change out of their footwear and outer clothing *prior to* crossing the LOS, and an area for putting on site-specific footwear and outer clothing *after* crossing the LOS (on the bird side).
- Items necessary to follow the Biosecure Entry Procedure for crossing the LOS (e.g., site-specific coveralls, footwear)
- Supplies to clean and disinfect equipment.
- A sink with running water and soap or hand sanitizer and signage instructing personnel to clean their hands.

Movement of people across the LOS requires Biosecure Entry and Exit Procedures. Specific biosecurity measures for equipment, supplies, and personnel to cross the LOS Access Point vary by site; these should be described in the site-specific biosecurity plan. It is important to consider the capacity that each site's Biosecure Entry and Exit Procedures can accommodate; the site's access points should be equipped to provide the largest anticipated number of personnel entries (e.g., processing crews) with all needed equipment and supplies. More information is available in [Section 5: Personnel \(Crossing the LOS\)](#).

Movement of poultry across the LOS should be done through an established LOS Access Point. In some facilities, the people LOS Access Point and the poultry LOS Access Point are the same. For others, especially shower-in/shower-out houses, the LOS Access Point for poultry is separate from the LOS Access Point for people. Some operations may find it necessary to temporarily modify the LOS for specific procedures such as moving poultry, equipment, manure or litter into or out of the house before/during re-stocking with new birds. These procedures can increase the risk of disease introduction and should be done with careful planning to minimize risk. A site-specific biosecure entry procedure should be defined for procedures that require a modified LOS. See [Section 10: Replacement Poultry \(Loading/Unloading Poultry\)](#) for more information.

Movement of personal items and food across the LOS is limited to that which is necessary to perform job duties and the items (e.g., hats, glasses, cell phones, lunch bags) should be clean and not worn/used around poultry or cleaned and disinfected before crossing the LOS. Certain items, such as electronics, may not be able to be effectively cleaned and disinfected and should be placed in a sealed plastic bag or container before crossing the LOS. Food is consumed in designated areas and never brought into poultry areas. Signage with reminders or instructions should be posted at the LOS Access Points.

Movement of vehicles, equipment and supplies that do not need to enter the poultry housing area should be directed to a designated area outside of the LOS. Signage indicating this should be posted at the LOS Access Point. All supplies that cross the LOS should be cleaned and disinfected. More information can be found in [Section 7: Equipment and Vehicles](#).

An entry logbook should be maintained by the Biosecurity Coordinator or on-site designee to record information about individuals who cross the LOS. More information about the entry logbook can be found in [Section 5: Personnel \(Entry Logbook\)](#).

4. Perimeter Buffer Area (PBA)

The perimeter buffer area is a functional zone surrounding the poultry houses or poultry raising area that separates them from areas unrelated to poultry production on that site and/or adjoining properties. It is comprised of the poultry houses and poultry raising areas as well as nearby structures and high traffic areas involved in the daily function of the poultry farm. This would usually include but not be limited to such things as feed bins, manure sheds, composting areas, egg rooms, generators, pump rooms, etc. The site-specific biosecurity plan should describe or illustrate the boundaries of the PBA and clearly outline the procedures that caretakers, visitors, or suppliers must follow when entering and leaving the PBA.

The Perimeter Buffer Area (PBA) Concept

By establishing and respecting biosecurity boundaries on the site, employees reduce the risk of transmitting AI virus to poultry flocks. The Biosecurity Coordinator is responsible for the development of SOPs, training of the employees, and verification of compliance with the SOPs so these boundaries are respected.^{1,4}

The Perimeter Buffer Area (PBA) is the first line of defense to protect the poultry housed on a farm. The PBA acts as an outer control boundary set up around the poultry houses to keep vehicles, personnel and equipment which have not been cleaned and disinfected from contaminating areas near the poultry houses. Entry to the PBA is restricted to a limited number of controlled PBA Access Points. Each PBA Access Point should be clearly marked with signage, understood by all entering, and protected with a suitable barrier. Production sites vary greatly in their structural layouts; therefore, the location of the PBA may vary at each site. The Biosecurity Coordinator should work with the owner/site manager to determine the location of the PBA. The PBA and site perimeter do not need to be the same. In many cases, the PBA is established closer to the buildings and doesn't include the entire perimeter of the site. See [Figures 1 and 2 in Appendix D](#) for examples of how the PBA might be laid out on a site.

The PBA should be set up so that nonessential vehicles do not enter the PBA and therefore do not need to be cleaned and disinfected each time they arrive at the site. A designated parking area should be located outside of the PBA where individuals can conveniently walk to the nearest PBA Access Point (see below) to better ensure compliance. Any vehicle entering the PBA should be cleaned and disinfected prior to entry. More information on the designated parking area and cleaning and disinfection is found in [Section 7: Equipment and Vehicles](#). More specific guidance is found in [Appendix J: Information on Cleaning and Disinfection](#) and [Appendix K: Setting up and Operating a Cleaning and Disinfection \(C&D\) Station](#).

When determining the best location for the PBA, consider the following:

- Traffic on roadways. Vehicles could be carrying virus in organic matter (mud, manure). Establish the PBA so that organic matter from vehicles does not cross the PBA through entry/exit points.
- Impact of potential weather conditions (rain, snow, mud) on the condition of drive paths near the PBA and walking paths to the PBA Access Point. The distance from the PBA to poultry houses depends on the drive paths for deliveries, weather extremes (PBA might be affected by snow removal), and what is known about the virus and its infectivity. There is not a specified distance, as it varies with the above conditions. This includes natural snow accumulation as well as plow routes and storage of snow.
- Daily routines on the site. Minimize the need for individuals working on the site to move into and out of the PBA when performing daily activities.
- Location of living quarters on the site, if applicable. Consider all the movements required for the household to operate (school bus, postal deliveries, non-farm employee vehicles, etc.). For ease of access, and improved compliance, households should be located outside of the PBA.

Employees, visitors, truck drivers and service personnel should be trained and understand the purpose and boundaries of the PBA. They should understand the procedures to follow when entering and moving around the site. Furthermore, the PBA should be established so that individuals, once within the PBA, do not need to leave the PBA during the course of their daily tasks, with few exceptions (e.g., delivering dead birds to a common pickup location). This reduces the number of times that personnel must complete entry/exit biosecurity procedures, thus reducing the risk of non-compliance and, consequently, flock infection. Establish an area outside of the PBA for routine deliveries, so that delivery personnel do not need to enter the PBA, or dedicate an off-site location for these deliveries.

Restricting site access to a limited number of entry points is beneficial for multiple reasons, including the prevention of theft, destruction of property, and introduction of disease agents onto the site. Entrance routes onto the site that enable unauthorized individuals to gain access should be locked when no one is present on-site. If a locked barrier is not possible at the site entrance, a barrier and signage should be placed at the PBA to restrict entry of unauthorized vehicles to the poultry facilities. All driveways leading to the production site that are not PBA Access Points should be suitably barricaded (e.g., by locked gate, hay bales, semi-trucks, heavy equipment, etc.) to prevent unauthorized vehicles and people from entering.

Optimally, a perimeter fence with an electric wire provides a layer of security to make sure that individuals and wildlife do not bypass the site entry.

PBA Access Point(s)

Specific biosecurity measures for vehicles, equipment, and personnel to enter the PBA Access Point are required and vary by site; these should be described in the site-specific biosecurity plan. More information is available in [Section 5: Personnel](#) (Entering the PBA) and [Section 7: Equipment and Vehicles](#).

Examples of how the PBA and PBA Access Points may be drawn on a site are included in [Appendix D](#). The PBA and PBA Access Point(s) should be included on the site map.

5. Personnel

The biosecurity program and/or the site-specific biosecurity plan should include provisions specifically addressing procedures and biosecurity PPE for site-dedicated personnel. The plan should likewise address the procedures and biosecurity PPE for non-farm personnel. The plan should also specify procedures which all personnel having had recent contact with other poultry or avian species should follow before re-entering the PBA.

Individuals and their clothing/footwear may become contaminated with AI virus through a variety of activities when they are off-site, such as:

- Working at or visiting other poultry sites
- Hunting, trapping, or fishing, or other contact with upland gamebirds or waterfowl, or their feces
- Living with people who work at other poultry sites, go to other poultry sites or are in contact with poultry waste or offal
- Visiting sites with swine, poultry or waterfowl
- Walking through areas contaminated with waterfowl feces
- Stopping at a gas station or convenience store previously visited by other poultry industry employees
- Visiting a farm supply store, feed store, or pet store

Prior to Arriving at the Site

It is possible to reduce the risk of AI virus introduction to a premises by taking certain precautions prior to arrival at the site. It is important to consider, prior to arrival, whether individuals arriving on the site will need to enter the PBA. Individuals who will not enter the PBA (nor cross the LOS) do not need to take extensive precautions, but should be aware of the cross-contamination risks they pose, and therefore arrive at the site with reasonably clean clothing and equipment. Personnel should cross the PBA only if their job duties require it; the site-specific biosecurity plan should include specific protocols for various personnel and situations. Personnel who enter the PBA in a vehicle should remain in the cab of their vehicle; this may require special accommodations. If individuals must exit their vehicle once inside the PBA, they must follow the site's biosecure entry procedure. For more information on vehicles entering the PBA, see [Section 7: Equipment and Vehicles](#).

Precautions can be taken prior to arrival at the site. The following arrival requirements supplement verifiable mitigation steps required at the PBA Access Point.

Prior to arrival at the site, it is recommended that all individuals who will enter the PBA:

- Shower and wear clean clothes and footwear prior to arrival on the site.
 - For poultry workers who live on-site, shower and change into clean clothing/footwear before leaving the residence to enter the PBA.
 - For individuals living off-site, after showering and changing into clean clothes and footwear, do NOT contact poultry, live or dead, or facilities where they are held prior to arrival at the site. When possible, avoid driving through areas where soiled vehicles associated with poultry or other susceptible species have already driven.
- Leave unnecessary personal items, such as jewelry, at home.

- Ensure that the inside of their vehicles are clean (free of poultry manure, litter, feathers, etc.), and are not contaminated by soiled clothes, footwear, or other items that could transfer virus to their clean clothing, clean footwear, and exposed skin, even if the vehicle will not enter the PBA.
- Understand and be able to follow all procedures for crossing the PBA and LOS before they arrive at the site.
- Sign an agreement verifying they have been informed of these biosecurity protocols and will abide by them (example agreement included in [Appendix G](#)).

Additional site-specific requirements may vary based on whether individuals are site-dedicated personnel, non-farm personnel, or if they have had recent contact with other poultry or avian species.

Entry Logbook

Prior to entering the PBA, individuals granted entry should sign the entry logbook maintained on site. At minimum, record name, affiliation, date, phone number, reason for entry, and the date and description of last poultry contact. The biosecurity plan should describe minimum downtimes (i.e., time away from birds) as well as biosecurity interventions for accidental violations. Logbook entries should be monitored by an individual working on the site to ensure accurate completion; this individual should have the authority to deny access to the premises if needed.

The Biosecurity Coordinator and/or his/her designated on-site manager should ensure the entry logbook is kept up-to-date for review. Sites can use existing entry logbooks in any format, including paper or electronic logs. The People Entry Logbook contains the information described above (see [Appendix F: Document 1](#)).

Biosecure Entry/Exit Procedures

The site-specific biosecurity plan should address specific entry/exit procedures and biosecurity requirements for each of the following types of individuals: visitors, site-specific personnel, non-farm personnel, and personnel with recent contact with other poultry or avian species. The site-specific biosecurity plan may also include procedures and personal protective equipment (PPE) specific for individuals with swine contact, or individuals with influenza-like illness (as pigs and humans are also influenza hosts—see [Appendix M](#)). Biosecure entry procedures should be communicated in writing to individuals frequenting the site and with service companies (trucking, processing, etc.) so they can be shared with the drivers. One way to accomplish this is through development of Standard Operating Procedures (SOPs), such as the Biosecure Entry Procedure steps below; however, some sites may require more stringent biosecurity measures.

Entering the PBA

Once arrival requirements (see “Prior to Arriving at the Site” above) have been satisfied, individuals entering the PBA should avoid travelling through areas where contaminated vehicles have driven (e.g., roads that other poultry companies commonly use) and proceed directly to the PBA Access Point. Personnel (such as feed truck drivers and propane delivery personnel) who need to cross into the PBA should remain in their vehicles if possible. If they must exit their vehicles inside the PBA, they should follow the protocols here.

To enter the PBA, it is recommended that individuals:

- Wear site-dedicated footwear, OR
- Wear disposable or disinfected footwear; AND

- Ensure hands are clean
 - Apply hand sanitizer and/or
 - Wear disposable or disinfected gloves over clean hands

These procedures should occur at the designated PBA Access Point for people entry or as individuals exit the cab of their vehicle within the PBA, if necessary. If there is a need to cross the LOS, individuals should follow the Biosecure Entry Procedure requirements below. The Biosecurity Coordinator or on-site manager is responsible for communicating the site-specific protocol to appropriate personnel and ensuring that it is followed.

Crossing the LOS

Once an individual has entered the PBA, he/she should proceed directly to the LOS Access Point, if crossing the LOS is required.

To cross the LOS, it is recommended that individuals:

- Before crossing the LOS
 - Leave personal items, such as cell phones and jewelry, outside the LOS, unless these personal items are permitted and allowed to undergo C&D procedures, AND
 - Remove street shoes/boots, socks, AND
 - Remove outer layer of clothing (e.g., a coat) to allow changing into site-specific clothing (coveralls or similar), AND
 - Ensure hands are clean
 - Wash hands and/or sanitize hands
- While crossing the LOS
 - Take care to not contaminate clothing, footwear, exposed skin, or other items from one side of the LOS to the other
- After crossing the LOS, before contacting birds
 - Ensure hands are clean
 - Wash hands and/or sanitize hands
 - If disposable or disinfected gloves are used, they should be put on over clean hands AND
 - Put on clean biosecurity PPE (i.e., site-specific coveralls or clothing), AND
 - Ensure that any street clothes or accessories, if permitted, are completely covered by biosecurity PPE, AND
 - Put on clean, site-specific boots or boot covers, OR
 - Put on disposable boot covers, OR
 - Clean and disinfect boots using proper cleaning and disinfection steps, including appropriate disinfectant contact time.

Some sites (e.g., laying houses, pullet raisers, breeders) are likely to require more stringent biosecurity protocols if poultry on their operation are very valuable, if AI virus is known to be in the region, or if presence of disease on the operation would be likely to spread to large numbers of birds. More stringent biosecurity protocols, such as requiring shower-in/shower-out when crossing the LOS, offer increased protection against spread of disease.

Procedures may vary depending on the job duties of the individual entering. For example, site-dedicated personnel may be required to only shower upon entering the farm, but can move between houses if wearing biosecurity PPE and exit without showering out, while non-farm personnel such as service technicians, contract crews, veterinarians or transporters that must visit multiple poultry houses may be

required to shower in and out of each house. Different procedures may also apply to individuals who have had recent contact with other poultry or avian species. Include specific protocols for these cases in your site-specific biosecurity plan.

The Danish Entry System is one example of a Biosecure Entry Procedure for people to cross at an LOS Access Point. This system includes a dedicated entrance area that straddles the LOS. The LOS Access Point is identified with a disinfectable barrier (showers, sealed plywood, plastic bench, etc.) that clearly demarcates the separation of poultry-side from non-poultry-side. Both sides of the barrier have clothing and footwear storage and supplies and/or facilities for handwashing. See [Appendix E Figures 3 and 4](#) for some examples. Further information on the Danish Entry System can be found in the video “The Danish Entry Principle” at https://www.youtube.com/watch?v=N4NNkd_Kfqw.

Additional procedures that operations may have on their sites include structural modifications, including adding “bio-buildings” which may include shower-in/shower-out facilities, pass-through disinfection for approved items (e.g., lunches), and other biosecurity approaches.

Keep on record all communications (written, oral, etc.) that occur between the Biosecurity Coordinator or designee and non-farm personnel, including dates and times of said communications. For example, keep a copy of the information sent to the contract crews with a site map showing where the crew’s vehicles are to drive and park, where and how equipment is to enter, and what the drivers are supposed to wear (disposable footwear, disposable gloves, no hats, etc.).

Biosecure Exit Procedure

In most cases, the Biosecure Entry Procedure is followed in reverse when crossing the LOS to exit the building. The goal is to remove visible contamination on PPE and exposed skin before leaving the site in order to prevent transmission of contaminants (such as AI virus) to other locations with susceptible poultry.

Individuals should remove any farm-dedicated protective outerwear and disposable PPE (e.g., gloves, boot covers, coveralls, hair nets, etc.), clean and disinfect farm-dedicated footwear, and wash hands before crossing the LOS. Soiled clothes and footwear could be left on the site to be laundered or cleaned. If the site does not provide running water and soap, and a scrub brush, water, and disinfectant, non-farm personnel should have a portable way of disinfecting anything they bring with them onto the farm. If soiled clothing or footwear must be removed from the site, it should be placed in a closed bag or container and stored until it can be laundered or cleaned and disinfected. Some sites may also have more stringent biosecurity measures, including showering out upon leaving the building and/or site.

6. Wild Birds, Rodents and Insects

Poultry operations should have control measures to prevent contact with and protect poultry from wild birds, their feces and their feathers as appropriate to the production system. These procedures should be reviewed further during periods of heightened risks of disease transmission. Control programs for rodents, insects, and other animals should be in place and documented.

Risk of Exposure from Wild Birds, Rodents, Insects, and Other Animals

Waterfowl carry all influenza subtypes without becoming ill. Ducks, and mallards in particular, are excellent long-distance carriers.⁵ Infected small wild birds may introduce AI into a house.⁶ Influenza virus is spread by the fecal-oral route in waterfowl. During annual migrations, waterfowl excrete virus

into bodies of water, where it can survive for months at cool temperatures and spread infection to other waterfowl. Domesticated poultry can become infected if they consume feed or water contaminated by wild bird feces. Feathers and contaminated dust can also carry AI virus and can contaminate the environment.³ Once inside a poultry house, influenza virus can spread quickly through susceptible hosts via respiratory droplets, manure, water lines, and feeders.

Rodents, including field mice and rats, may be contaminated with AI viruses on their hair, feet, etc. Rodent control is an important part of influenza and other biosecurity plans.²

Houseflies and blowflies may also carry AI virus.^{7,8} While insects are hard to eliminate in the poultry production environment, control measures should be in place to reduce and prevent breeding and entry into barns, vehicles, and other areas that may allow insects to enter the poultry production environment.

Other animals like wildlife, dogs, and cats can potentially spread AI virus from infected to susceptible poultry either directly via host-to-host transmission or indirectly via contaminated fur, feet, or feathers.^{2,3}

Biosecurity Measures to Prevent Exposure from Wild Birds, Rodents, Insects, and Other Animals

Biosecurity measures against wild birds, rodents, insects, and other animals fall into three categories: clean, exclude, and control.

Clean: General farm maintenance, weed/grass control around barns, sanitation and drainage are important to reduce attraction of wild birds, rodents, and insects to the farm. Remove trash regularly and clean up feed spills promptly. Remove or compost waste eggs and dead birds promptly. Manage manure and litter to keep moisture content low (see [Section 9: Manure and Litter Management](#)). Protect feed from wild birds, rodents, and insects during preparation, storage, and handling to prevent contamination (see [Section 12: Feed and Replacement Litter](#)). Remove standing water that may attract migratory waterfowl, wild animals and insects to the site.

Exclude: Seal and screen doors, windows, and vents to prevent wild birds, rodents and insects from entering a poultry house, and keep closed when not in use. Plastic or vinyl strips can be hung vertically in areas where people regularly move through to help exclude birds and insects. A combination of wildlife exclusion strategies such as netting, screening and anti-bird spikes along with other engineering changes can be used to discourage wild birds from roosting and nesting on poultry barns or nearby buildings.

To prevent rodents from entering a poultry house, plug holes larger than ¼ inch with material such as copper mesh or steel wool. Particularly vulnerable areas include those where pipes or wires enter poultry houses. When possible, avoid building materials which are easily chewed and damaged by rodents, particularly along barn walls, between wall panels, in attics, and in manure/ compost piles. Seal foundation and other cracks. Keep grass or brush near poultry houses short. Building perimeters should be lined with gravel at least 3 feet wide to prevent burrowing.¹⁰

Control: Waterfowl harassment programs may discourage birds from frequenting ponds, creeks, wastewater lagoons, or other water sources near a poultry production site. Most waterfowl can be harassed without a permit, except during breeding season, by chasing, noisemakers and use of decoys; check with your state department of natural resources to determine applicable laws and regulations. The perimeter of open water can be fenced and a tight grid can be installed over water sources to make access difficult for birds.⁹

Rodent activity may be detected by the presence of chewed building material crumbs, droppings, and holes. Infrared cameras are also useful for finding rodents inside of barns after dark. Record and monitor strategically placed traps and bait stations for rodent activity. An integrated pest management system is an effective way of detecting and eliminating rodents from a poultry farm.

Two rodent control options include:

- A company-developed rodent control plan: The Biosecurity Coordinator designates, under supervision if necessary, a rodent control monitor who effectively implements a written rodent control plan. The Biosecurity Coordinator may also serve as the rodent control monitor.
 - Many effective rodenticides (poison baits) are commercially available, including anticoagulants such as warfarin, or non-anticoagulants such as bromethalin and cholecalciferol. Rodenticides are available as pellets, cereal meal, seeds, wax blocks, and packets. Any rodenticide should be used according to label directions, and strict safety measures must be observed to prevent poison consumption by non-target species (e.g., children, pets, poultry, wildlife). Effectiveness of the bait should be assessed regularly and baits rotated routinely. Snap traps, multiple-capture live traps, and glue boards are effective when alternating rodent traps and bait stations. Based on the results of rodent population monitoring, the number and location of traps and/or stations can be adjusted where necessary. Further guidance on recommended rodent monitoring and control methods can be found at <https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Eggs/ucm285101.htm>.
 - Rodent populations usually increase significantly during barn manure hauling activities and during crop harvest seasons. Prepare to increase the quantity of traps and stations, and monitor more frequently, during these times.
 - Rodent populations may become disrupted by barn depopulation and repopulation and move to new locations. Monitor rodent trap and bait station placement for efficacy following such bird movements.
 - The frequency of monitoring should be determined based upon the rodent population on the site; log entries may be made monthly or more frequently. An example is included in [Appendix H: Example Record of Rodent Monitoring](#).
- A contracted rodent control plan: The site uses a professional rodent control company, whose operations are monitored by the Biosecurity Coordinator.
 - Pest control operators working within the PBA and/or LOS must follow biosecurity measures as outlined in [Section 5: Personnel \(Biosecure Entry/Exit Procedures\)](#) of this Manual.
 - Keep records (e.g. invoices or other documentation) provided by a licensed pest control operator describing rodent control measures for the site.
 - Producer makes and documents corrective actions recommended by the professional rodent control company.

Insect control options include:

- A company-developed insect control plan: The Biosecurity Coordinator designates, under supervision if necessary, an insect control monitor who effectively implements a written insect control plan. The Biosecurity Coordinator may also serve as the insect control monitor.
 - Insect populations can be reduced by exclusionary tactics as well as biological and/or chemical control programs. Biological control involves propagation of fly predators, such as the macrochelid mite and hister beetle, which can live in poultry manure. Chemical control consists of insecticide applications of pyrethroids, carbamates, organophosphates,

and others, which may target larvae or adults. Rotation of chemical control products is often beneficial and reduces the chance of developing resistance.¹⁰ Chemicals should be mixed and applied according to label instructions with proper application methods. Note that use of chemical controls may interfere with biological control methods. Combining the two methods should be pursued carefully for best results.

- Manage manure piles to maintain moisture levels less than 40% throughout to limit insect breeding. Wet manure spots should be topped with drying materials.
- Water leaks from drinker lines contribute to a wet environment conducive to insect breeding. Monitor for leaks regularly and repair promptly. Use fresh, clean bedding materials to dry wet spots under leaks.
- Maintain proper barn ventilation to control moisture. Monitor fans, baffles, heaters, louvers, and other mechanisms to ensure they are in proper working order.
- Insect populations usually increase significantly during barn manure removal and bird movements. Increasing insect control measures prior to these activities reduces the spread of adult flies and beetles.
- Determine the frequency of monitoring based on the insect population onsite. Further guidance on recommended rodent monitoring and control methods can be found at <https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Eggs/ucm285101.htm>. An example is included in [Appendix I: Example Record of Insect Monitoring](#).
- Effective implementation of the program includes taking and documenting corrective actions when insect populations exceed acceptable levels.
- A contracted insect control plan: The site uses a professional insect control company, whose operations are monitored by the Biosecurity Coordinator.
 - Pest control operators working within the PBA and/or LOS must follow biosecurity measures as outlined in [Section 5: Personnel \(Biosecure Entry/Exit Procedures\)](#) of this Manual.
 - Keep records (e.g. invoices or other documentation) provided by a licensed pest control operator describing insect control measures for the site.
 - Effective implementation of the program includes taking and documenting corrective actions when insect populations exceed acceptable levels.

State and local regulations for controlling birds, rodents, insects, and other animals must be followed. Use of chemical control methods must follow all label directions and regulations to avoid contamination of poultry, poultry products such as eggs or meat, and the environment.

The Biosecurity Coordinator should ensure that the site's wild bird, rodent and insect control plan are documented in the site-specific biosecurity plan and implemented on the site. The Biosecurity Coordinator or designee should maintain and monitor written records of these control measures.

7. Equipment and Vehicles

The biosecurity plan should include provisions for procedures for cleaning, disinfection, or restriction of sharing of equipment where applicable. Vehicle access and traffic patterns should be defined in the site-specific biosecurity plan.

Equipment used on poultry production sites can serve as a means for disease spread. This includes any items used for the handling, care, treatment, or euthanasia of poultry, or any other items that may have

contacted infected poultry or entered poultry houses. Additionally, public roadways may be contaminated with AI virus. When possible, all vehicles and equipment should remain outside of the PBA.

All records of vehicle and equipment movements by date and time onto the site should be maintained on-site and made available to Responsible Regulatory Officials if needed for a trace-back or trace-forward investigation. Records should also disclose whether vehicles and equipment have been shared with other poultry sites; such vehicles and equipment should not be permitted to enter unless no alternatives exist, and should follow the guidelines below (see “Sharing Equipment” below). See [Appendix F: Document Two](#) for an example Vehicle and Equipment Entry Log.

Employees should be trained to monitor vehicle cleanliness to help ensure compliance, and the site-specific biosecurity plan should identify objective check points for determining if vehicles, equipment, and supplies are effectively cleaned and disinfected. Vehicles and equipment that have not been effectively cleaned and disinfected should not be permitted to enter the site until effective cleaning and disinfection occurs.

Vehicles Remaining Outside of the PBA

Vehicles and equipment should be prohibited from entering the PBA unless necessary. Personal vehicles of employees and visitors should not enter the PBA unless authorized and after undergoing C&D procedures described in the biosecurity plan. Parcel and other deliveries should be made to a designated area outside of the PBA, if possible. Vehicles removing manure/litter from a site that uses a belt system to deliver manure to a separate building should remain outside the PBA and follow designated routes, as this building should be outside the LOS and the PBA (see [Section 9: Manure and Litter Management](#)). If this is not possible, then vehicle C&D and traceability measures should be followed.

In some cases, as in grain/feed delivery by truck, the vehicle may remain outside of the PBA and the delivery boom swings over the PBA to accomplish feed delivery. In this case, the driver remains outside the PBA and operates the boom from the truck. An individual working inside the PBA may then complete the steps required to receive the delivery.

Designated Parking Area

The designated parking areas for employee, visitor and serviceperson vehicles should be located outside of the PBA to reduce the need to clean and disinfect vehicles upon each arrival and reduce the chance of AI virus on vehicles crossing to the poultry side of the PBA/LOS. Locate the parking area where individuals can conveniently walk to the nearest PBA Access Point to improve compliance.

Post signs designating the parking area to ensure vehicles remain away from the PBA and thus, poultry housing areas. The designated parking area should be labeled on the site map. For examples of a possible location of the designated parking area, see Figures 1 and 2 in [Appendix D](#).

Site-Dedicated Vehicles and Equipment

Individuals should walk or use designated site-dedicated farm vehicles to move about the site or haul equipment, supplies, or treatment materials to the poultry houses once within the PBA. A vehicle (e.g., pickup truck, utility transport vehicle) should be available on the site if necessary. If a site-dedicated vehicle or piece of equipment exits the PBA, it should not re-enter without undergoing effective cleaning and disinfection at a dedicated PBA Access Point.

Vehicles and Equipment Entering the PBA

Vehicles and equipment entering the PBA should be effectively cleaned and disinfected before entry. Effective disinfection of vehicles and equipment requires thorough cleaning to remove visible contamination, proper application of an EPA-registered disinfectant labeled for avian influenza A viruses (see <https://www.epa.gov/pesticide-registration/list-m-registered-antimicrobial-products-label-claims-avian-bird-flu>), then allowing time at an appropriate temperature for the disinfectant to kill the virus (more information below). Alternative methods may also be used if these methods are effective in destroying the virus; for example, using heat treatment after the appropriate time/temperature. For live poultry transport, the truck and trailer should be effectively cleaned and disinfected after being unloaded or before being loaded. Vehicle windows and doors should remain closed as much as possible and the cab should have an approved insecticide available if needed.

All vehicles and equipment entering the PBA should only do so through a PBA Access Point. However, some operations may find it necessary to temporarily modify the LOS for specific procedures such as moving poultry, equipment, manure or litter into or out of the house before or during re-stocking with new birds. These procedures can increase the risk of disease introduction and should be done with careful planning to minimize risk. A site-specific biosecure entry procedure should be defined for procedures that require a modified PBA or LOS. More information relating to transport of replacement poultry can be found in [Section 10: Replacement Poultry](#).

Sharing Equipment

Sharing of site-dedicated vehicles and equipment should be avoided. Sharing of specialized equipment that is used infrequently (e.g., manure handling equipment, decaking equipment, turkey or chicken loading equipment, spent hen removal equipment, pullet crates, etc.) between poultry sites presents a risk for virus spread. Shared equipment should only visit one site per day and should be effectively cleaned and disinfected between sites. If shared equipment is used, the Biosecurity Coordinator should communicate with the source of incoming vehicles or equipment to ensure that they are effectively cleaned and disinfected prior to arrival at this site, and document this communication and contact information. Vehicles arriving at the site should still be cleaned and disinfected immediately prior to entering the PBA. Poultry facilities or operators of shared equipment should consider having a dedicated building for washing/disinfection of equipment under controlled conditions or by heat treatment. Any shared equipment that enters the PBA should be kept away from live poultry; if shared equipment must cross the LOS, this should only occur for terminal movements.

Cleaning and Disinfection (C&D)

Any equipment that crosses the PBA or LOS should be cleaned and disinfected. Options for cleaning and disinfection may change with advances in knowledge and technology, but should be demonstrated to be effective. There are two ways to inactivate AI virus on equipment:

1. Thorough cleaning, application of an effective disinfectant, then allowing adequate contact time for the disinfectant to kill the virus.

Cleaning and disinfection is best accomplished at a Cleaning and Disinfection (C&D) station on-site. At least one stationary or mobile C&D station should be available near a designated access point into the PBA to clean and disinfect vehicles, equipment, and items prior to crossing.

- The C&D stations should be equipped with good lighting, adequate water, soap, and a disinfectant effective against Influenza A virus.

- Basic steps, supplies needed, and an example Standard Operating Procedure (SOP) for the C&D process can be found in [Appendix K: Setting Up and Operating a Cleaning and Disinfection \(C&D\) Station](#).
- When determining the location of the C&D station or the mobile C&D stations, consider the following:
 - The wash pad at the C&D station, or the area used to C&D, should be free of dirt/mud (ideally on a hard/solid/paved or well-drained gravel surface).
 - The wash pad/C&D area and surrounding space should be sloped AWAY from poultry housing, waterways, feed receiving or storage areas, and on-farm vehicle or equipment traffic areas.
 - All applicable state or local regulations regarding the management (capture/diversion) of the run-off/effluent should be followed. This may require building drainage ditches, berms, or other physical barriers to ensure poultry are not exposed, and that environmental concerns are addressed.
- The C&D station(s) should be well marked with signage and should be indicated on the site map.

Designated individuals operating the C&D station should be trained in proper selection and use of safety personal protective equipment (PPE) to protect against chemical hazards, effective C&D methods, and safe use of approved disinfectants. The safety PPE necessary depends on the disinfectant used; consult the label for more information. Individuals should also be aware of special precautions for safety and efficacy during inclement weather; for example, disinfectants may need to be protected from sunny or hot conditions, or individuals may need to shield themselves from blowing disinfectant during windy weather.

It is difficult to completely clean and disinfect internal components of some equipment, and some disassembly or shield removal may be required.

2. Heating the equipment for a time and temperature that inactivates the virus

Cleaning equipment and then heating it to 56°C (133°F) for three hours has been recommended.^{11,12,13} This time and temperature may be longer than necessary since other publications have demonstrated killing of AI viruses at 30 or 60 minutes. However, there must be enough time for internal components of equipment which may be contaminated to reach the desired temperature for the correct amount of time.

Equipment could be cleaned, then placed in a heated building overnight with automatic controls to raise the temperature for a specified time (56°C (133°F) for three hours) then cool down. Research is needed to determine what temperature is effective for overnight (8 to 10 hours) disinfection of equipment.

Additionally, certain equipment or items may enter the PBA or cross the LOS without cleaning and disinfection if it is from a known clean source. For example, deliveries of supplies such as pharmaceuticals may not be C&D but rather double-boxed, with the interior box only entering the PBA or crossing the LOS by emptying it out of the disposable outer box as it moves through the access point.

More information on Cleaning and Disinfection can be found in [Appendix J](#).

Contingency Plan for Inclement Weather

Cleaning and disinfection is very difficult, if not impossible, in the winter in northern climates or during rain or severe weather events, unless conducted inside a building. The AI virus can survive indefinitely when frozen. Dry cleaning and heat treatment under these conditions is preferred over water washing.

Create a contingency plan for inclement weather and include this in the biosecurity plan. Below are a few suggestions.

- Contingency plans may include:
 - Creating a sheltered C&D station (e.g., within a building);
 - Using another structure on the site (but outside of the PBA) as a temporary C&D station during inclement weather;
 - Using a hot water source for C&D;
 - Determining alternate delivery options or on-site drive paths; and/or
 - Designating an off-site location, such as a truck wash, for washing all vehicles and equipment arriving on site during inclement weather.
 - Vehicles or equipment cleaned and disinfected off-site should arrive free of visible contamination, and should not visit any other sites with poultry after cleaning and disinfecting.
 - During some periods of inclement weather, effective C&D of equipment and vehicles immediately prior to entering the PBA is impossible. In these situations, using hand-sprayers with disinfectant against the AI virus on the undercarriage, wheel wells, and tires may help reduce some of the risk. However, the disinfectant is unlikely to be effective if organic matter is present, if temperatures are very low, or if adequate contact time is not observed.

8. Mortality Disposal

Mortality should be collected daily, stored and disposed in a manner that does not attract wild birds, rodents, insects, and other animals and minimizes the potential for cross-contamination from other facilities or between premises. It is recommended that dead bird disposal be on-site, if possible. Mortality disposal should be described in the site-specific biosecurity plan.

Develop a plan for disposal of all deceased birds. The plan should include the process for seeking and removing dead poultry, frequency of removal, storage and disposal of carcasses, and pest control around mortality storage and disposal areas. Options for disposal may include composting, incineration, burial, or rendering; each comes with its own challenges related to disease prevention. Methods and options may vary locally or by state and should comply with all local, state, and federal regulations, which may change during an AI outbreak; in this case, regulatory officials managing the outbreak may provide guidance on appropriate disposal.

The site-specific mortality plan should address procedures for handling mortality disposal in a way that reduces the potential for cross-contamination from other facilities, between premises and with other animal species like wildlife. It is recommended that dead birds are removed and placed in a closed, leak-proof container within the LOS during the day and the container removed daily. If re-usable containers are used to transport mortality to a dead bird collection container or disposal site, the re-usable containers from each house should be cleaned and disinfected before being returned to the house.

- Dead bird disposal may be on-site or off-site (consider available land area and available equipment) as long as it is accomplished in a biosecure manner designed to prevent disease transmission.
- Burial and composting should be completed in a way that prevents wild birds, waterfowl, rodents, other wildlife, pets, and insects from accessing the carcasses.
- Rendering trucks and other vehicles which service multiple poultry sites hauling dead animals to a common disposal site should not cross the PBA. Site-dedicated vehicles which haul dead animals in a closed container to a common disposal site should not cross the PBA, or should not cross the PBA without effective C&D prior to entry and re-entry.
- A temporary collection container for mortalities may straddle the PBA so that it may be accessed from both sides of the PBA (see Figures 1 and 2 in [Appendix D](#)). The dead bird collection container may become contaminated from vehicles and equipment accessing the container from outside the PBA.
- Visits to mortality disposal sites should be at the end of the day to avoid carrying any contaminants from farm to farm. Once individuals responsible for removing mortality cross to the outside of the LOS, they should not re-enter the LOS until site-specific biosecure entry procedures (including down time, as applicable) have been completed.

Sites should develop a plan for carcass disposal of all deceased poultry using normal mortality numbers and a contingency plan for a large number of mortalities unrelated to AI infection (ventilation failure, toxicity, etc.). For example, the plan should describe how the dead birds are moved to the pickup location and demonstrate that the vehicles/equipment accessing the pickup location never cross the PBA. Carcass movements should be drawn on the site map or communicated in some other effective manner. The site's mortality disposal plan needs to be reviewed and updated as needed at least once a year. See [Appendix D](#) for some examples of mortality removal pathways.

9. Manure and Litter Management

Manure and spent litter should be removed, stored and disposed of in a manner to prevent exposure of susceptible poultry to disease agents. Onsite litter and manure storage should limit attraction of wild birds, rodents, insects, and other animals.

Avian influenza virus has been shown to survive in poultry manure and litter for long periods of time, especially in cold weather.¹⁴

There are numerous manure and litter management strategies that may be used, and which of these is implemented depends on the type and number of birds and type of housing system (e.g., deep pit, high rise, scraper, liquid-added manure, free range, etc.). Manure and management strategies also depend on physical characteristics of the site and weather. Different strategies present different risks that should be considered, such as groundwater and surface water contamination, runoff, and increases in wildlife and insect populations. The site-specific plan should include the types and amounts of manure or litter expected over a given time frame; procedures to collect, transport, store, and use the manure; any state, local, and Responsible Regulatory Official designated regulations; environmental concerns and wildlife/insect control. For these reasons, it is very important for the Biosecurity Coordinator to develop a site-specific plan for manure and litter management for each production site. In addition, contingency planning for long-term litter or manure storage may be necessary for prolonged outbreaks. Spreading or storing litter or manure off-site may not be permitted depending on the risk of AI virus spread; all local, state and Responsible Regulatory Official regulations must be met. Vehicles and equipment used for

manure collection and transport should follow a Biosecure Entry Procedure when entering the PBA. All vehicles and equipment involved in manure removal and cleaning should be clean and disinfected before arrival to the site (see [Section 7: Equipment and Vehicles](#)). Whenever possible, site-dedicated equipment should be used.

The Biosecurity Coordinator should develop site-specific SOPs for personnel involved in manure/litter management activities. Prior to arriving at the site, all individuals involved in manure and litter removal should follow requirements for individuals who will be entering the PBA (see [Section 5: Personnel \(Prior to Arriving at the Site\)](#)). People who have crossed the PBA and/or LOS at the access point should not be allowed to cross back to the outside of the LOS, and vice-versa, without completing the appropriate biosecure entry/exit procedures.

Vehicles removing manure/litter from a site that uses a belt system to deliver manure to a separate building outside the PBA may remain outside the PBA and follow designated routes. If this is not possible, then vehicle C&D and traceability measures should be followed. Multiple poultry farms should not share initial collection sites for manure/litter disposal, especially if dead poultry are added to the manure/litter as a part of a composting process.

Temporary Changes to the PBA and/or LOS for Manure/Litter Movement

All vehicles and equipment entering the PBA should only do so through a PBA Access Point. However, some operations may choose to make temporary modifications to the PBA and/or LOS for manure and litter movement. This increases risk of disease introduction and must be done under careful supervision. The decision may be to avoid manure and litter removal from an uninfected flock site when in an AI Control Area. A site-specific biosecure entry procedure should be defined for procedures that require a modified PBA or LOS. In this case, buildings that have been emptied of birds at the end of a production cycle may be treated as being outside of the PBA: the LOS no longer applies to the house because there are no birds in the house to become infected. This allows crews and equipment to repeatedly enter the building to remove birds and manure/litter. The PBA and PBA Access Point should be temporarily re-located so that work done there does not put flocks in other buildings at risk. If the building is connected to other buildings, efforts should be made to isolate the building, such as modifying air flow from power air ventilation systems, closing doors and hanging plastic curtains to temporarily seal off the building from connected buildings. Personnel involved in manure removal should understand where they and their equipment are allowed to operate and areas where they are not allowed in order to reduce the risk of contamination. Other personnel on the site inside the PBA should avoid the building that is being emptied and should not use the PBA Access Point for manure/litter removal. After the building is emptied and effectively cleaned and disinfected the LOS and PBA around the building can be restored. There are several ways in which this may be handled. In some cases, the LOS and PBA remains temporarily modified until the building has been restocked. In other cases, once the disinfection step is complete, LOS and PBA are restored to normal access and then when new birds are to be placed, the modified LOS and PBA are again temporarily relocated.

The Biosecurity Coordinator should determine which of these options is best for the site depending on premise layout and the downtime between flocks; the site-specific biosecurity plan should include specific protocols required if modified access points are used.

After manure/litter removal is complete, the PBA and LOS should be decontaminated before returning to their original locations. Once the last manure handling vehicle leaves through the designated entry/exit, the building should be cleaned and disinfected, the portion of the PBA Access Point allowing entry into the building should be closed, and the LOS reinstated as the building walls. After this occurs, the PBA should also be restored. This could be done by proper cleaning and disinfection of the PBA Access Point

if it is hard-surfaced. If it is gravel or dirt, the risk may not be able to be fully mitigated. Methods that may reduce risk include application of quick lime/hydrated lime, covering the area with gravel/road rock or a thick layer of agricultural lime, or allowing it to sit undisturbed for a period of time in warm weather.

After each move from the operation to an off-site manure/litter storage or disposal location, equipment should be effectively cleaned and disinfected before it is taken to another poultry site.

Cleaning and Disinfection of the Poultry House between Flocks

Once manure/litter is completely removed from the poultry house, the poultry house should undergo complete cleaning and disinfection (using chemical disinfectants or heat) before the introduction of new birds. All live and dead birds, old feed, eggs, and other gross organic matter must be removed before cleaning and disinfection. Complete cleaning and disinfection should include waterline treatment. This may also require a modified PBA, LOS, and/or access points depending on the method of cleaning and disinfection used. If manure/litter is re-used for the next production cycle, a modified cleaning and disinfection procedure may be used to prepare the building before restocking. The Biosecurity Coordinator should develop site-specific SOPs for these processes.

10. Replacement Poultry

Replacement poultry should be sourced from health-monitored flocks which are in compliance with NPIP guidelines. They should be transported in equipment and vehicles that are regularly cleaned, disinfected and inspected. Biosecurity protocols should be in place for equipment and personnel involved in the transport of replacement poultry.

Sourcing Replacement Poultry

Replacement poultry should be sourced from poultry flocks of known high health status that are regularly monitored for poultry pathogens according to the NPIP guidelines (i.e., AI Clean or H5/H7 AI Clean). Additional information about the source may help assess the risk for potential introduction of AI. This includes flock health status, vaccine and disease history, and negative monitoring for AI and other diseases, as well as biosecurity protocols.⁴ Requesting a copy of the hatchery/source farm's biosecurity protocols may help ensure that the source site's biosecurity plan aligns with yours, particularly if the source site is under different ownership/management. Replacement poultry should test negative for Influenza A virus according to the NPIP AI Clean, H5/H7 AI Clean, or H5/H7 Avian Influenza Monitored requirements (for most poultry, this means a negative agent and/or antibody test within 21 days of movement). Additionally, when filling a house, aim for single-source chicks, pullets, or poults per building (avoid co-mingling) to simplify trace-back investigations.

The interior of the trailer used to move poultry should be cleaned, disinfected (using chemical disinfectants or heat) and allowed to dry prior to loading cages with poultry (See [Section 7: Equipment and Vehicles \(Cleaning and Disinfection\)](#)). Containers and equipment used for placement of poultry should be new or effectively cleaned and disinfected. Personnel loading or delivering poultry should wear biosecurity PPE (e.g., site-specific clothing), and personnel loading poultry cages into the trailer should either wear biosecurity PPE or avoid entering the LOS.

During an AI outbreak or periods of heightened disease risk, additional testing or movement restrictions, such as a Pre-Movement Isolation Period (PMIP) may be needed. It may be beneficial for the Biosecurity

Coordinator to include these measures in their site-specific biosecurity plan steps, should they be needed. See the Secure Poultry Supply Plan website for specific guidance (<https://securepoultrysupply.umn.edu/>).

Loading/Unloading Poultry

Loading and unloading poultry presents an increased risk of disease introduction since open trucks containing live birds cannot be effectively cleaned and disinfected when crossing the PBA without harming the birds. These procedures should be carefully designed and monitored by the Biosecurity Coordinator/designee in order to minimize risk. Avoid bringing new poultry to a site inside a Control Area imposed due to an AI outbreak.

Impose an all-in, all-out system: after a house is stocked, new birds should *not* be introduced. For example, chicks, pullets, or poults should not be introduced to replace early mortalities in order to keep the house fully stocked. Perform a risk assessment to develop a procedure for the introduction of spike males into a breeding flock.

Minimize the risk of disease introduction by ensuring that the personnel transferring birds over the LOS comply with Biosecure Entry and Exit Procedures. All movement of birds, cages, dollies, and other containers should occur only through designated PBA and LOS Access Points.

Vehicles and equipment used for loading/unloading should follow a Biosecure Entry Procedure when entering the PBA. For empty trailers without birds, this includes effective cleaning and disinfection.

When loading/unloading poultry, maintain directional flow of birds and personnel. People or animals which have crossed the PBA and/or LOS at the access point should not be allowed to cross back to the outside of the LOS, and vice versa without going through the appropriate biosecure entry/exit procedures. Certain processes may require an extra person in order to maintain compliance with biosecurity.

Personnel entering the trailer to transport birds in containers should wear task-appropriate clothing and footwear. Empty containers should either be disposed of in a safe manner or returned to the trailer. At the end of each bird move from one hatchery/farm to another site, reusable equipment should be effectively cleaned and disinfected before being taken to another poultry site for a new loading/unloading process.

One method of live bird transfer may be to transfer poultry using a staged area located at a PBA Access Point immediately outside of the PBA perimeter, where cages can be unloaded, and then loaded onto an on-site vehicle immediately inside of the PBA perimeter. The vehicle within the PBA should travel to a location directly outside of the LOS Access Point, and the containers can then be unloaded by two personnel (one on each side of the LOS). Live poultry or poultry products (e.g., spent hens, eggs) could be moved off the site in this same manner, using internal vehicles to transport poultry or product from the LOS Access Point to the PBA Access Point.

Another option is to temporarily modify the PBA and/or LOS Access Point for loading/unloading. For example, if poultry loading/unloading consists of an on-site truck and trailer moving the poultry and containers from the perimeter of the PBA to the LOS Access Point, the LOS may be temporarily “opened” to include the interior of the trailer and the barn entry, while the truck and outside of the trailer remain outside of the LOS. Likewise, the PBA may be temporarily modified, or “opened,” to accommodate vehicles holding live animals, which thus cannot be C&D, but must enter the PBA to load/unload poultry. If the PBA is modified, the entering vehicle should be C&D to the extent possible (e.g., tires and wheel wells) and should take only the shortest, most direct path to the loading/unloading site, while avoiding other susceptible poultry. In the case of modified access points, vehicles entering the site that have not been C&D may introduce AI virus on their truck tires, and the contents (manure, litter,

feathers) can spill onto the site, posing a risk of disease introduction into the PBA or LOS.^{4,15,16} Therefore, once the last poultry movement vehicle of each day leaves, the modified area (drive path and loading site) should be cleaned and disinfected. Following C&D, the modified Access Point for loading/unloading should be “closed” and the PBA or LOS immediately reinstituted. If the modified area is a gravel or dirt path, effective C&D may be impossible. The risk could be reduced by covering with a thick layer of agricultural lime.

11. Water Supplies

It is recommended that drinking water or water used for evaporative cooling be sourced from a contained supply such as a well or municipal system. If drinking water comes from a surface water source, water treatment must be used to reduce the level of disease agents. If surfaces have been cleaned or flushed with surface water, subsequent disinfection should be employed to prevent disease transmission. If water treatment is not possible, a risk analysis should be performed to determine actions needed to mitigate risks.

Water crosses the LOS daily and could pose a risk for transmission of AI virus. Many wild waterfowl may carry AI virus and pass the virus in their feces, potentially contaminating surface water such as lakes, ponds, rivers, and streams. The virus can live for extended periods in water. The Biosecurity Coordinator should take steps to ensure that any water used within the poultry site for drinking, cooling, or washing is clean and free of disease agents.

- It is recommended that drinking water, water used for evaporative cooling or water used for cleaning is sourced from a properly maintained, contained supply such as a well or municipal system.
- Water should be tested and treated as needed to eliminate any potential contamination with live AI virus. This applies to all water used inside the poultry buildings: for drinking, for cooling, or for washing.
- Use of inadequately treated or untreated surface water may be a source of avian influenza infection. If water comes from a surface water source, water treatment should be used to eliminate disease agents.
- Consider the following when choosing water treatment methods:
 - Experts in water treatment should be consulted on effective, continuous treatment to eliminate viable virus without harming the flock (e.g., chlorination).
 - If poultry house surfaces have been cleaned or flushed with surface water, subsequent disinfection should be used to prevent disease transmission. The Biosecurity Coordinator should include equipment and supplies needed and steps for effective C&D in the site-specific biosecurity plan.
 - Special procedures may be needed when using modified-live virus vaccines in treated water as the vaccines may be inactivated. Products are available for inactivating the chlorine in drinking water so that live vaccines can be given.
- The site-specific biosecurity plan should describe the water treatment(s) used, if applicable.
- If water treatment is not possible, the Biosecurity Coordinator should provide evidence that the risk of an untreated system has been considered and demonstrate steps to mitigate that risk if feasible.

12. Feed and Replacement Litter

Feed, feed ingredients, bedding, and litter should be delivered, stored and maintained in a manner that limits exposure to and contamination by wild birds, rodents, insects, and other animals. Feed spills within the PBA (outside of the LOS) should be cleaned up and disposed in a timely fashion.

Feed delivery trucks that enter the PBA should be cleaned and disinfected before entry. This is especially important during periods of heightened risk, if feeds come from a commercial source which also services other farms, or if feed trucks travel on high-risk routes (e.g., where other poultry trucks drive, routes near rivers/lakes populated by waterfowl). Alternatively, certain feedstuffs could be poured from the outside of the PBA into an on-site feed bin or other vehicle/equipment that is within the PBA, to prevent entry of the feed delivery truck. Feed, feed ingredients, and replacement litter can be contaminated if exposed to wild waterfowl or other birds, insects or rodents that might be carrying AI virus. There is no evidence that contaminated feed or litter contributed to HPAI virus introduction in the 2015 or other recent outbreaks; however, the following precautions should be taken and procedures documented in the biosecurity plan:

- Finished feed, feed ingredients, and fresh litter should be stored and handled so that it cannot be contaminated, or treated to eliminate contamination.
- Finished feed, feed ingredients, and fresh litter delivery trailers should be covered so that the contents cannot be contaminated during transport.
- Finished feed, feed ingredients, and fresh litter should be stored in closed bins or buildings which exclude the potential for contamination with AI virus.
- If bagged feed is used, it should be elevated off the floor and proper rodent control procedures should be implemented in these areas.
- Common feed spill areas should be identified and measures to capture or reduce spilled feed in these areas should be implemented.
- Finished feed and litter should be transported from storage into poultry houses in a manner that prevents it from being contaminated.
- All feed, feed ingredients, and litter spills should be cleaned up as soon as possible to minimize attraction of wildlife and rodents.

The Biosecurity Coordinator should include in the site-specific biosecurity plan measures to limit exposure of feed, feed ingredients and replacement litter to contamination by wild birds, rodents, insects, and other animals. This may include written protocols, log sheets, guidance for contractors, etc. There should be a daily feed spill check. It is important to consider the entry and movement of feed delivery vehicles and the feed they carry when determining the best location for the PBA and Access Points. It may be necessary to temporarily modify the PBA if there is extensive unloading of grains during harvest.

13. Reporting Elevated Morbidity and Mortality

Elevation in morbidity and/or mortality above expected levels, as defined by the biosecurity plan, should be reported as required in the site-specific biosecurity plan and appropriate actions should be taken to rule out reportable disease agents.

Wild birds and waterfowl such as ducks and geese infected with AI do not usually show clinical signs and typically do not experience mortality. Similarly, poultry flocks infected with LPAI may appear normal, or have slightly elevated morbidity. In contrast, HPAI causes extremely high morbidity and mortality in poultry (between 90–100 percent). HPAI is also associated with significant, detrimental economic consequences. It is extremely important to recognize elevated morbidity and mortality as early as possible and report it to Responsible Regulatory Officials to implement effective AI control strategies.

Expected mortality numbers vary by bird type, flock age, and even by individual flock. The Biosecurity Coordinator should include in the site-specific biosecurity plan the mortality rate that constitutes elevated morbidity and mortality, taking into account the variables of flock age and bird type, and ensure that individuals working on the operation understand appropriate measures for monitoring and reporting elevated morbidity and mortality. These individuals should understand that total morbidity and mortality trends, as well as localized areas (e.g. elevated numbers in a group of closely located/adjoining cages) of morbidity and mortality within a poultry house, are key to recognizing disease. Logs, tracking graphs, case reports, investigations, etc. may be used to assist with monitoring, as appropriate. The site-specific biosecurity plan should include a written procedure for appropriate response to elevated morbidity or mortality reports. The reporting procedure should clearly describe the appropriate chain of communication within the poultry company and should include the Responsible Regulatory Officials; this information should be available onsite for immediate reporting if necessary.

14. Auditing

Auditing of the biosecurity principles is based on flock size as outlined in 9 CFR 53.10. Audits shall be conducted at least once every two years or a sufficient number of times during that period by the Official State Agency to ensure the participant is in compliance. Each audit shall require the biosecurity plan's training materials, documentation of implementation of the NPIP Biosecurity Principles, corrective actions taken, and the Biosecurity Coordinator's annual review to be audited for completeness and compliance with the NPIP Biosecurity Principles. An audit summary report containing satisfactory and unsatisfactory audits will be provided to the NPIP National Office by the OSAs. Those participants who failed the initial document audit conducted by the NPIP OSA may elect to have a check audit performed by a team appointed by National NPIP Office including: an APHIS poultry subject matter expert, the OSA, and a licensed, accredited poultry veterinarian familiar with that type of operation. If these participants seek to be reinstated as being in compliance with the Biosecurity Principles by the NPIP OSA, they must demonstrate that corrective actions were taken following the audit by the team appointed by NPIP.

Compliance with the National Poultry Improvement Plan (NPIP) Program Standards Biosecurity Principles can be met by referencing the following resources:

- The Self-Assessment Checklist for Implementing Poultry Biosecurity

- This Information Manual for Implementing Poultry Biosecurity
- The NPIP Program Standards Biosecurity Principles Audit Form (found here: <http://poultryimprovement.org/documents/AuditForm-BiosecurityPrinciples.pdf>)
- The NPIP Program Standards Biosecurity Principles Audit Guidelines (found here: <http://poultryimprovement.org/documents/AuditGuidelines-BiosecurityPrinciples.pdf>).
- Your NPIP Official State Agency (found here: <http://www.poultryimprovement.org/documents/OfficialStateAgencies5-9-2018.pdf>).

Although some sites may be exempt from auditing (see 9CFR 53.10 and the HPAI Interim Rule), it is in the best interest of producers to comply with the guidance outlined in the NPIP Program Standards and Self-Assessment Checklist above and detailed in this information manual to reduce the risk of AI introduction.

Audits conducted by Official State Agencies (OSA) may be a simple record (e.g., paper and/or electronic records) assessment of a participant's written biosecurity plan. Therefore, it is of utmost importance that the Biosecurity Coordinator develop a written site-specific biosecurity plan that addresses how the production site implements the biosecurity protocols described in this document. The Biosecurity Plan should be reviewed annually and adapted to address changing risks or recommendations. The biosecurity plan should be located where it can be accessed by individuals frequently entering the operation, Responsible Regulatory Officials, and the attending veterinarian upon request.

Although a successful audit may be completed without a farm site visit, the written biosecurity plan can only be effective if everyone on the operation follows it, all of the time. Regular and complete training of the Biosecurity Coordinator, on-site manager (if different), caretakers and other personnel on the farms and production sites is important to keep AI out of the flock(s). All individuals entering the operation should understand how to perform the biosecurity measures that pertain to their areas of responsibility. Regardless of whether a site is required to, or has already passed, an NPIP audit, the Biosecurity Coordinator should continually emphasize the importance of biosecurity protocols for AI prevention. Communication of the importance of biosecurity is vital to any operation to protect poultry health.

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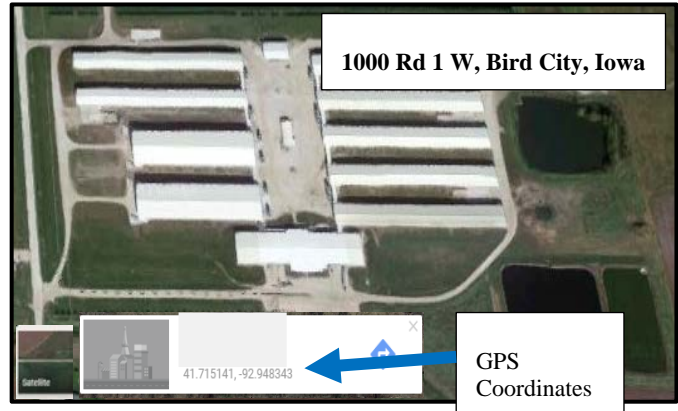
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Appendix A: How to Create a Site Map for a Biosecurity Plan











To create a site map for a biosecurity plan, it is necessary to obtain an aerial map of your operation (steps described below). This can then be labeled by hand or using a computer (also described below).

Getting Aerial View via Google Maps*

*Google Maps is one example of aerial images provided free of charge online. There are others such as www.bing.com/maps and <https://zoom.earth>; use what works best for your operation. The steps below pertain to Google Maps.



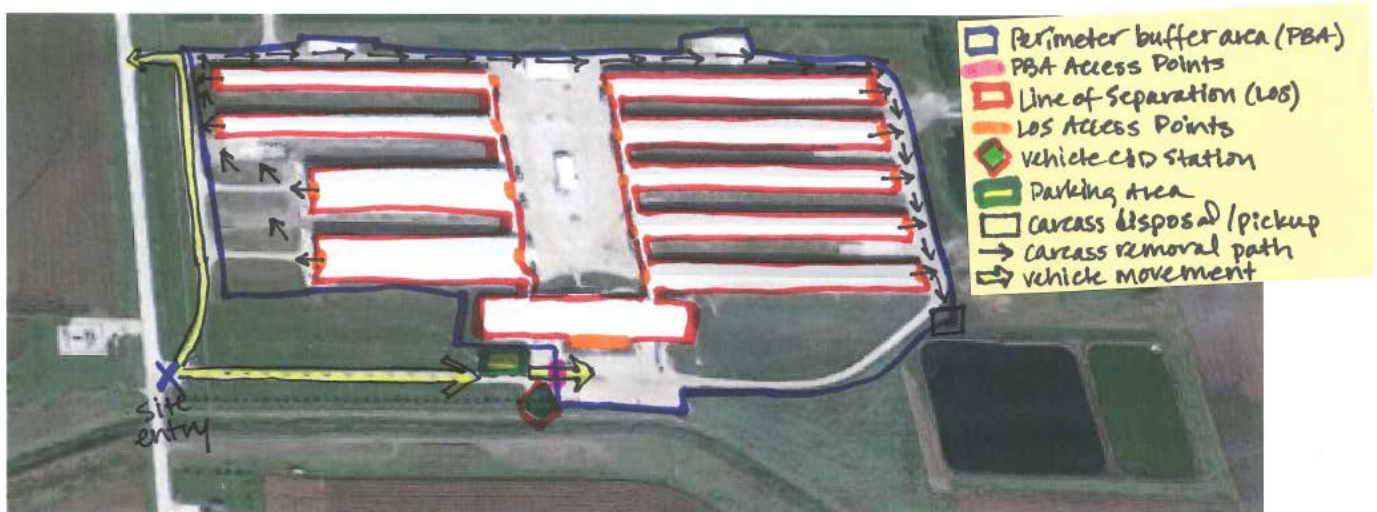
1. Open an internet browser. Type in the URL:
<https://www.google.com/maps>
2. Type in the address of your production site
(address where the buildings are located, not home address—if different).
3. Click on the small box in the lower left that says “Satellite”
4. Zoom in so that you can visualize all barns and accessory structures once you see the satellite view. The entire site should still fit within the screen.
5. Find your site location on the map where the poultry are located and click. A gray “pushpin” icon will appear. At the bottom of the screen, you will see the GPS coordinates in light gray below the location’s address. Copy this information to include in your site map.
6. Go to your biosecurity plan in Microsoft Word, but keep the internet browser in Google Maps open behind Word. Click on “**Insert**” in the toolbar; click “**screenshot**,” click “**screen clipping**.” The browser will move to the front and be frosted. You can now use the mouse to select the area you want to copy into the word document.
7. Label the map the following items and include a legend:

	Perimeter Buffer Area (PBA)
	PBA Access Point(s)
	Line of Separation (LOS)
	LOS Access Point(s)
	Vehicle cleaning and disinfection (C&D) station(s)
	Designated parking area
	Carcass disposal/pickup location
	Carcass removal pathways
	Vehicle movements (animal transport vehicles, deliveries, etc.)
	Site Entry

Labeling Map By Hand

Use colored pencils or pens to draw the lines, arrows, and shapes listed above on your map.

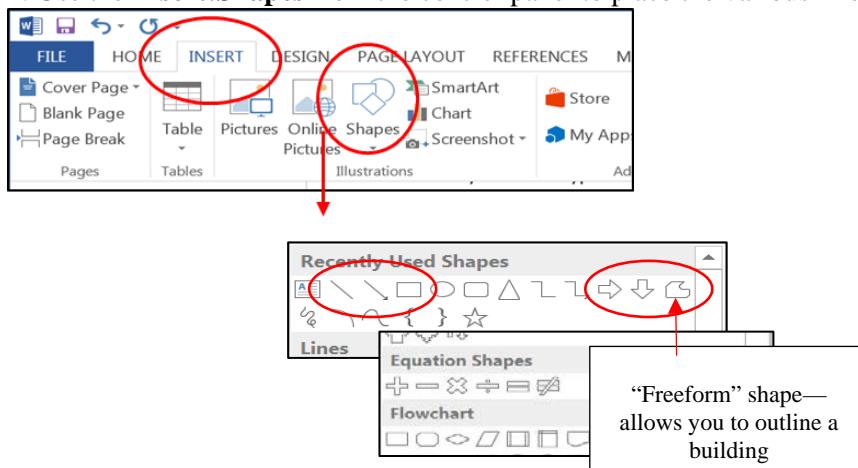
Here is an example of a completed map with legend:



Labeling Map Using Computer

Microsoft Word is one example of a common word processor that allows placement of digital lines, arrows, and shapes on a graphic, others are also available. This is only an example. The steps below pertain to Microsoft Word.

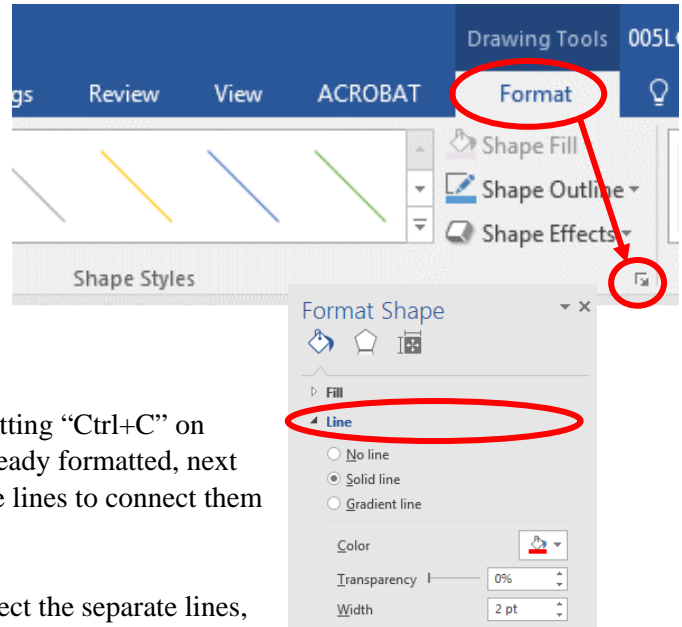
1. Use the **Insert:Shapes** from the control panel to place the various lines and shapes



2. Use the "Line" tool to make the PBA and LOS surrounding the farm. This allows for editing individual areas if these were to change in the future. The "Freeform" tool is helpful to use in smaller, more complicated areas, but will make it difficult to edit later and should only be used in stationary areas of your LOS.

3. After you insert your first line, click the “Format” tab at the top of the page. Click the expander button in the “Shape Styles” section to expand your formatting pane to the right side of the page.

- Use the “Format Shape” panel on the right to adjust the color and line width of your lines, arrows, and shapes.

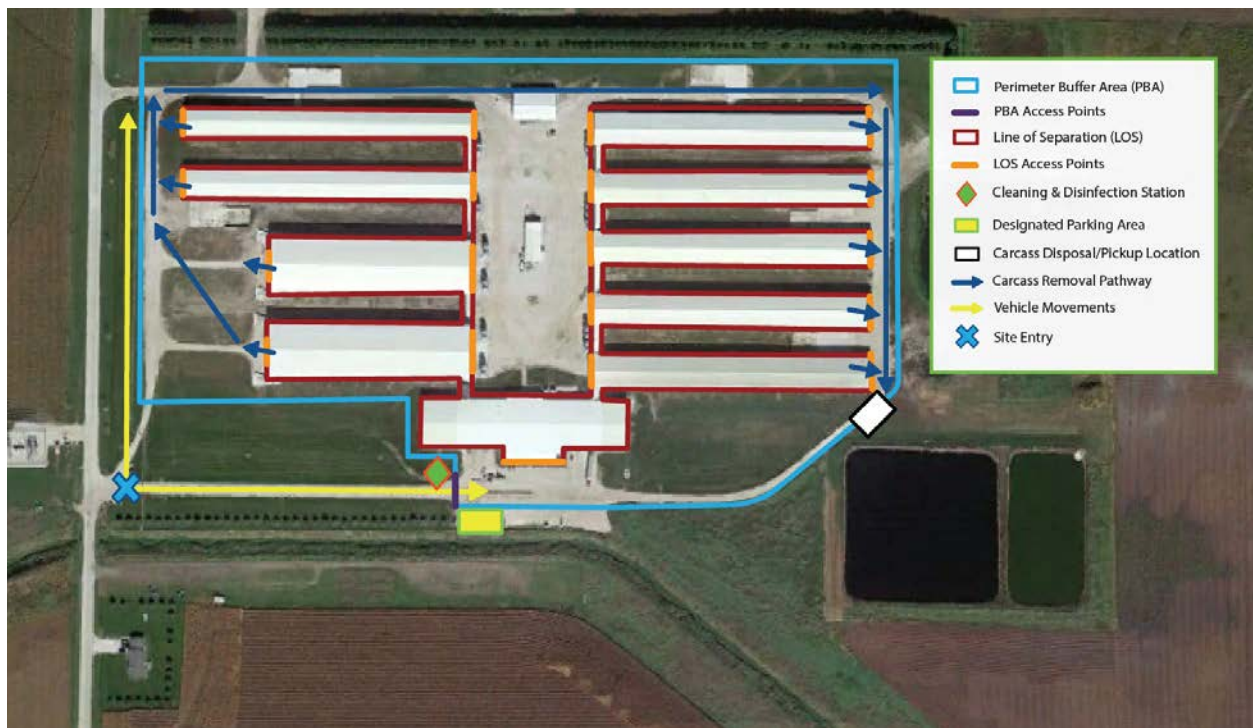


4. Copy the formatted line by selecting it and hitting “Ctrl+C” on your keyboard. Paste a new line (“Ctrl+V”), already formatted, next to the first one you created. Drag the ends of the lines to connect them at the appropriate locations.

5. If you have a hard time seeing where to connect the separate lines, zoom in on your map using the zoom option at the bottom right of the word document.



Here is an example of a completed map with legend:



Appendix B: Example* of Group Training Form

Trainer Name: _____ Phone: _____ Email: _____

Trainees Place of Employment (Name): _____

Premises ID _____ Training Date: _____

	Trainee First and Last Name	Training Topic	Trainee Signature Upon Completion of Training
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
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15			
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17			
18			
19			

*Note that this form is just an example and may not necessarily meet the requirements of the Responsible Regulatory Official or the needs of the producer.

Appendix C: Inputs/Outputs for the Site & Contingency Planning

Cleaning and disinfection of vehicles crossing the Perimeter Buffer Area is time and resource intense. Carefully planning the location of the PBA based on the types, drive path, frequency, and necessity of inputs/outputs can help focus resources to minimize possible AI virus entry. Decide if some movements could be modified. For example, move your garbage bin to the edge of the PBA so the garbage truck can pick it up without crossing the PBA or auger grain across the PBA into a farm wagon that remains inside the PBA. Below are some input/outputs that may apply to your site. Evaluating the frequency and travel path can be used to help determine PBA placement. Include the completed chart in your biosecurity plan. Farms with multiple species should account for additional inputs/outputs not listed here.

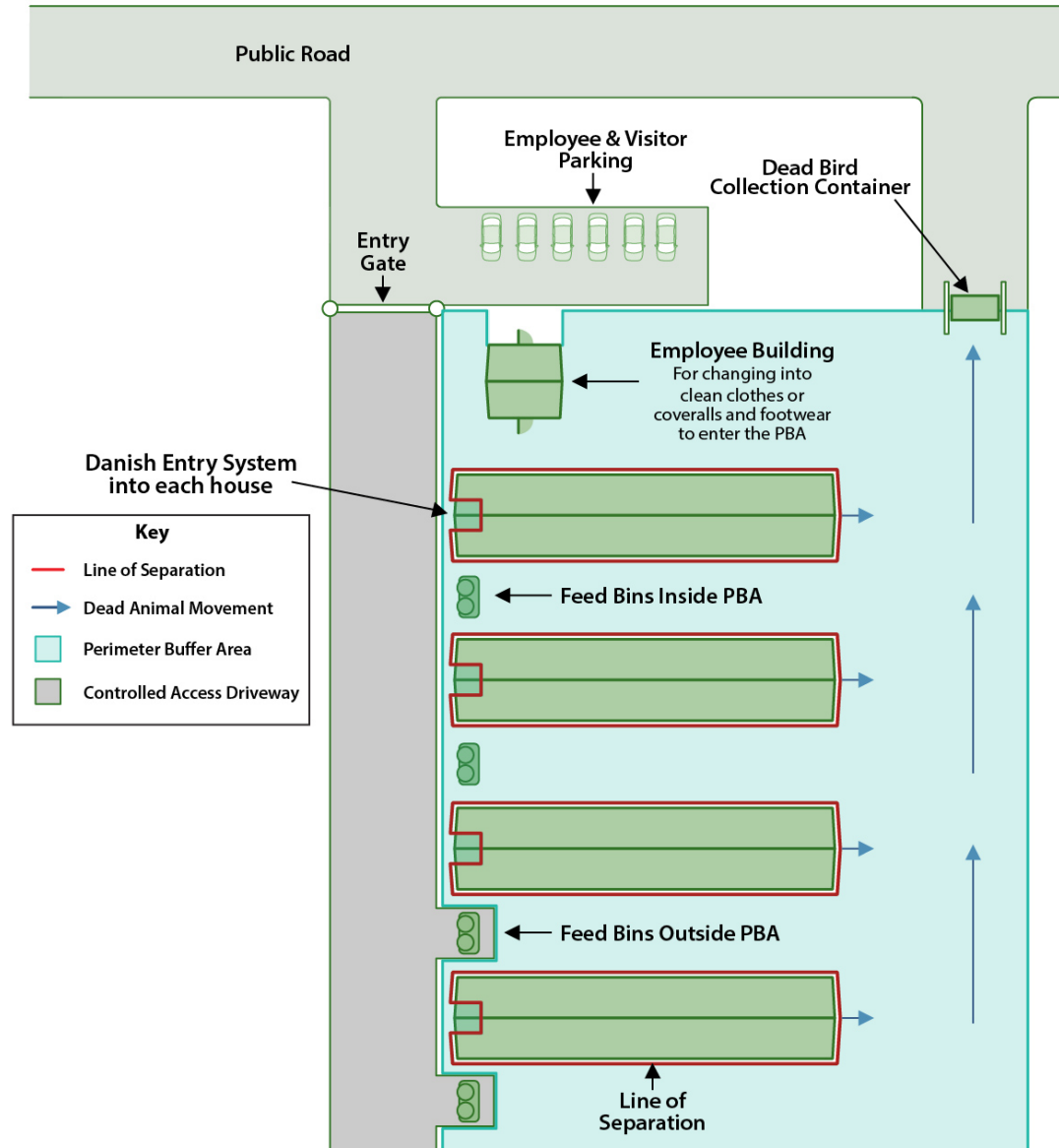
The last column helps with a contingency plan, if delaying certain movements, especially during periods of heightened risk, would facilitate enhancing biosecurity on your operation. This form can be modified to reflect actual conditions of each poultry premises.

Inputs/Outputs	Frequency of input/output	Path traveled by:	How long could you go without this movement?
Incoming poultry (replacement chicks/pullets)	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week? <input type="checkbox"/> Month? <input type="checkbox"/> Year?
Outgoing poultry (finished broilers, spent hens)	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week? <input type="checkbox"/> Month? <input type="checkbox"/> Year?
Feed commodity delivery (bulk ingredients, bagged feed)	<input type="checkbox"/> More than once/day <input type="checkbox"/> Daily <input type="checkbox"/> Every other day	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week? <input type="checkbox"/> Month? <input type="checkbox"/> Year?
Feed delivery to poultry house	<input type="checkbox"/> More than once/day <input type="checkbox"/> Daily <input type="checkbox"/> Every other day	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week?
Feed delivery to poultry off-site	<input type="checkbox"/> More than once/day <input type="checkbox"/> Daily <input type="checkbox"/> Every other day	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week?
Feed harvest	<input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> Week? <input type="checkbox"/> Month?
Replacement litter	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week?

Inputs/Outputs	Frequency of input/output	Path traveled by:	How long could you go without this movement?
Fuel delivery	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week?
Propane delivery	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> Animals <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week?
Veterinary/poultry care personnel (consulting veterinarian, nutritionist, technicians, etc.)	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week? <input type="checkbox"/> Month? <input type="checkbox"/> Year?
Pharmaceutical deliveries	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week? <input type="checkbox"/> Month? <input type="checkbox"/> Year?
Mail/package deliveries	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week?
Garbage removal	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> Animals <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week?
Dead bird removal	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week? <input type="checkbox"/> Month? <input type="checkbox"/> Year?
Manure/litter removal	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week? <input type="checkbox"/> Month? <input type="checkbox"/> Year?
Other _____ (ex. access to break room, maintenance shop, residence, etc.)	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	<input type="checkbox"/> Onsite vehicles <input type="checkbox"/> Equipment <input type="checkbox"/> People <input type="checkbox"/> None	<input type="checkbox"/> One day? <input type="checkbox"/> Few days (2-6 days)? <input type="checkbox"/> Week? <input type="checkbox"/> Month? <input type="checkbox"/> Year?

Appendix D: Examples of Perimeter Buffer Areas and Lines of Separation on Poultry Sites

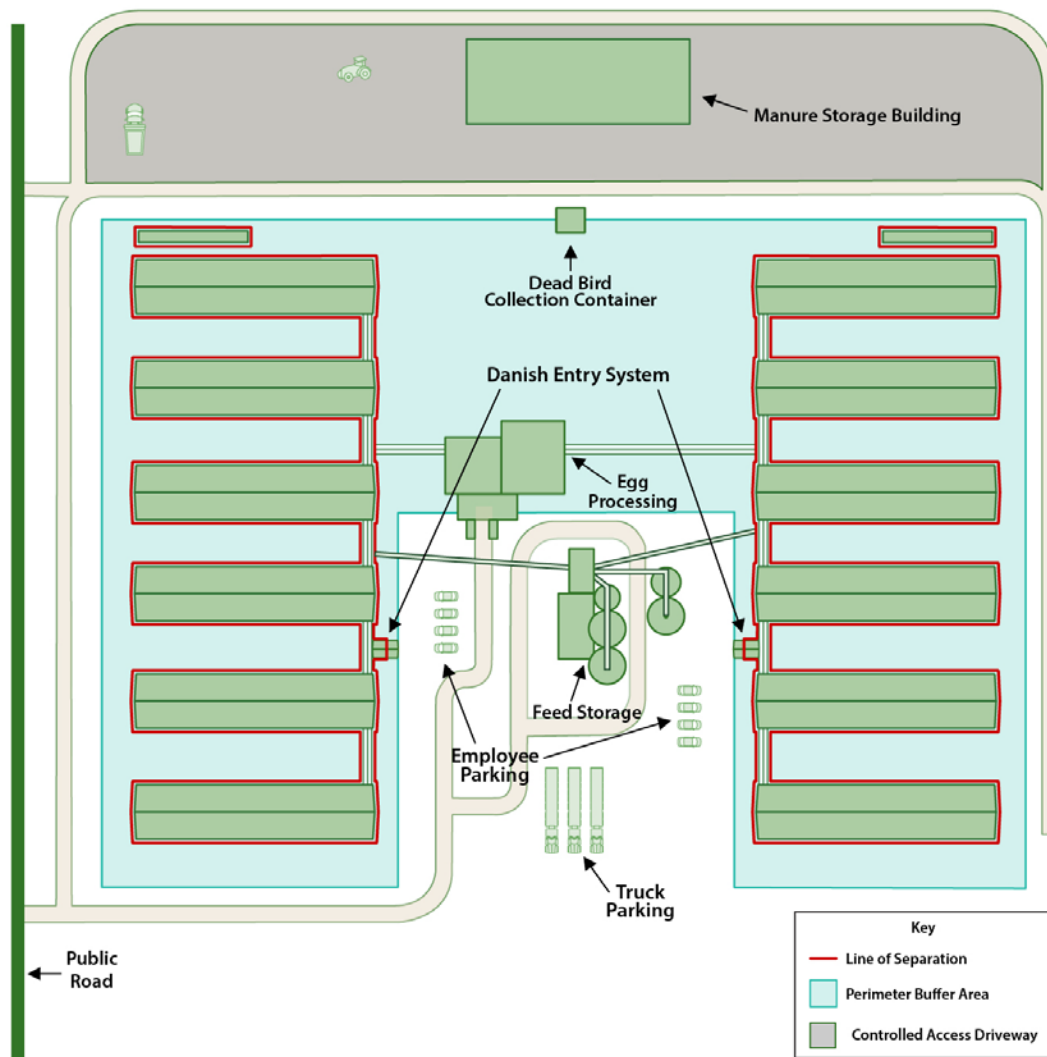
Figure 1: Illustration of PBA and LOS around a site



Source: Center for Food Security and Public Health, Iowa State University

This example site demonstrates the concepts of the Perimeter Buffer Area (PBA) and Line of Separation (LOS). In this example, access to the site is restricted by an entry gate leading to a controlled access driveway; employee and visitor parking remains outside the gate. The PBA surrounds the employee building and poultry houses, and allows for one-way movement of dead birds to a dead bird collection container straddling the PBA. Personnel enter the PBA through the Employee Building where they change into clean clothes or coveralls and footwear. The walls of each poultry house function as the LOS, with Danish Entry Systems as the Biosecure Entry Procedure to access the poultry areas.

Figure 2: Illustration of PBA and LOS around a site with an egg processing facility



Source: Center for Food Security and Public Health, Iowa State University

In this example, the employee parking, truck parking, and feed storage areas are all outside of the LOS. The PBA surrounds the egg processing facility and poultry houses. Personnel enter the PBA through an Access Point; this then leads to a Danish Entry System, which is the only way to cross the LOS and access the poultry houses. The LOS surrounds all poultry houses, which are connected to one another by a walkway and egg belt. The dead bird collection container straddling the PBA can be accessed both from an on-site vehicle within the PBA and from an off-site vehicle on the drive at the top of the diagram. The manure storage building is located outside of the PBA, so that it can be accessed by off-site vehicles that have not been cleaned and disinfected.

Appendix E: Examples of Biosecure Entry Procedures

There are several possible configurations for a Biosecure Entry Procedure. The objective is for personnel to leave boots and outer clothing in the entry, to wash or sanitize hands, then to put on barn specific boots and outer clothing after crossing the LOS. When designing a facility for a biosecure entry, consider worker safety and ensure compliance with local fire and OSHA requirements.

Figure 3: Bench Entry Schematic



Source: Center for Food Security and Public Health, Iowa State University

The Bench Entry System is an example of a Biosecure Entry Procedure for people to cross at an LOS Access Point. This system includes a dedicated entrance area. The LOS Access Point is identified with a disinfectable solid barrier (sealed plywood, plastic bench) that clearly demarcates the separation between the entry and animal areas. On the poultry side of the line, site-specific coveralls or clothing and footwear are available as well as handwashing facilities. An example of a Bench Entry System that could be implemented is shown in the figure above.

Figure 4: Biosecure Entry Examples



Source: Ontario Pork Industry Council, Danish Entry Examples, 2013

Appendix F: Movement Logs

Document One: Example* People Entry Log

Farm Name: _____ Farm PremID (PIN): _____ Address: _____
 Contact Name: _____ Phone: _____

Date MM- DD-YY	Name	Affiliation	Phone Number	Reason for Entry	DATE and DESCRIPTION of Last Poultry Contact*
					(Packing plant, farm, auction, exhibition, etc. AND City/State)

*Note that this form is just an example and may not necessarily meet the requirements of the Responsible Regulatory Official or the needs of the producer.

**If recent poultry contact (incl. hunting/other recreational activities) has occurred, contact the Biosecurity Coordinator to discuss the risk of entering the PBA

Document Two: Example* Vehicle, Equipment Entry Log

Farm Name: _____

Farm PremID (PIN): _____ Address: _____ Contact Name: _____ Phone: _____

Date	License Plate # & State	Driver Name	Driver Phone #	Vehicle Description	Reason for Entry	C&D on site?	Initials of Person Supervising Entry
						Yes No	
						Yes No	
						Yes No	
						Yes No	
						Yes No	
						Yes No	
						Yes No	
						Yes No	
						Yes No	
						Yes No	

*Note that this form is just an example and may not necessarily meet the requirements of the Responsible Regulatory Official or the needs of the producer.

Document Three: Example* Poultry Movement Log

Farm Name: _____

Farm PremID (PIN): _____ Address: _____ Contact Name: _____ Phone: _____

Date	Number/ Description of Birds	IN or OUT	Site of Origin (PIN, address, and/or barn or house #)	Site of Destination (PIN, address, and/or barn/house #)	Reason for Poultry Entry/Exit	Transporter Contact Information (Company, Driver name, Phone)	Initials of Site Personnel Supervising Movement

*Note that this form is just an example and may not necessarily meet the requirements of the Responsible Regulatory Official or the needs of the producer.

Appendix G: Example Employee and Visitor Arrival Agreement

If I enter the Perimeter Buffer Area, at a minimum I agree to the following biosecurity measures:

- Shower and change into clean clothes and footwear prior to my arrival at the site.
- After showering and changing into clean clothing and footwear offsite, I will not have any contact with poultry or facilities where poultry, live or dead, are held (e.g., my home, other premises, auction market, buying station, slaughter plant, rendering plant) prior to my arrival onsite. Once onsite, I will avoid areas where vehicles that have not been cleaned and disinfected have driven.
- I will maintain a clean vehicle interior, free from contamination of poultry litter/manure and soiled clothes, footwear, or other items.

I agree to follow additional biosecurity measures once on the premises based on my job duties that reduce the risk of introducing disease to the poultry. If I observe or perform a breach of biosecurity (accidental or intentional), I will promptly inform the Biosecurity Coordinator* of the date, time, and nature of the incident.

Apéndice G: Ejemplo acuerdo de entrada de empleados y visitantes

Si yo ingreso al área perimetral de protección, como mínimo estoy de acuerdo con las siguientes medidas de bioseguridad:

- Ducharme y ponerme ropa y calzado limpio antes de mi llegada a las instalaciones.
- Después de ducharme y cambiarme con ropa y calzado limpio fuera del establecimiento, no tendré ningún contacto con aves de corral o instalaciones donde se alojan aves de corral vivas o muertas (por ejemplo, mi casa, otros establecimientos, mercados de subastas, estación de compra, mataderos, planta de procesamiento) antes de mi llegada al establecimiento. Una vez que este en el establecimiento, evitaremos áreas donde hayan estado presente vehículos, que no han sido limpiados y descontaminados.
- Mantendré el interior de mi vehículo limpio, libre de contaminación de estiércol/residuo de aves de corral y de ropa, calzado y otros artículos sucios.

Estoy de acuerdo en seguir con medidas de bioseguridad adicionales una vez dentro del establecimiento, basado en mis funciones de trabajo que reducen el riesgo de introducir enfermedades a las aves de corral. Si observo o realizo una violación de la bioseguridad (accidental o intencional), informaré lo antes posible al coordinador de bioseguridad* sobre la fecha, hora y naturaleza del incidente.

Print Name/ Imprimir nombre

Phone/ teléfono

Signature/Firma

Date/ fecha

Biosecurity Coordinator Phone/coordinador de bioseguridad teléfono:

*Note that this form is just an example and may not necessarily meet the requirements of the Responsible Regulatory Official or the needs of the producer.

Appendix H: Example Record of Rodent Monitoring

Farm Name: _____ Farm PremID (PIN): _____

Address: _____ Contact Name: _____ Phone: _____

Rodent traps/bait stations should be checked weekly and contents replaced when low.					
	Date	Visual inspection findings (rodent types trapped, evidence of rodent activity, etc.)	Number of rodents caught	Bait replenished (Y/N)	Initials of site personnel checking bait station
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

*Note that this form is just an example and may not necessarily meet the requirements of the Responsible Regulatory Official or the needs of the producer.

Appendix I: Example Record of Insect Monitoring

Farm Name: _____ Farm PremID (PIN): _____

Address: _____ Contact Name: _____ Phone: _____

Insect traps/monitoring devices should be checked regularly and replaced/replenished when low.					
	Date	Visual inspection findings (insect types trapped, evidence of insect activity, etc.)	Estimated number of insects noted	Trap or monitoring device replaced or replenished? (Y/N)	Initials of site personnel checking insect
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

*Note that this form is just an example and may not necessarily meet the requirements of the Responsible Regulatory Official or the needs of the producer.

Appendix J: Information on Cleaning and Disinfection

Overview

Cleaning and disinfection can involve the use of physical (e.g., heat) or chemical (e.g., disinfectant) processes. These processes vary in their level of destruction of infectious agents. Influenza virus is sensitive to a wide range of disinfectants and can also be inactivated by heating and drying. Organic material must be removed before chemical disinfection can be effective and the disinfectant must completely penetrate any porous material present or it will not reach the pathogens that may be present. A number of chemical disinfectants have been approved for use against avian influenza. Only EPA-registered or approved products should be used. EPA disinfectant products registered and labeled with a claim to inactivate **avian influenza A** viruses on hard, non-porous surfaces can be found at <https://www.epa.gov/pesticide-registration/list-m-registered-antimicrobial-products-label-claims-avian-bird-flu>.

Disinfectants can be used or applied in a variety of ways (e.g., spraying, foaming, misting, wiping, submersion). The preparation and application of disinfectant solutions must be in accordance with product label directions. Disinfectants should be used only as directed; appropriate controls, such as personal protective equipment, should be in place to minimize human exposure. Generally it is best to have clean surfaces dry before disinfectant application. The label also specifies the sites (e.g., poultry houses and farms) for application of the product. Fumigation may be used in some situations for items that cannot get wet (e.g., electronics).

Contact time is essential! Microorganisms are inactivated or killed by disinfection products gradually, not instantaneously. Allowing adequate contact time increases the efficacy of any disinfectant. Contact times may vary depending on the product or method used and the ambient temperature and should be specified on the label of the product selected. Areas being disinfected should remain wet with the disinfectant during the necessary contact time. Reapplication of the disinfectant solution may be necessary to achieve the indicated contact time found on the product label. Some disinfectants may evaporate quickly (e.g., alcohols), while others may have residual activity (e.g., phenols).

Factors Affecting Cleaning and Disinfection Efficacy

Debris and organic material (e.g., soil, bedding, litter, feed, manure) can also inactivate many disinfectants (especially chlorine and iodine containing compounds). Cleaning and disinfection procedures should be carried out in a systematic manner to ensure effective reduction, removal, inactivation and destruction of the virus. Removal of all organic material prior to application of a disinfectant is essential. In some cases of lightly soiled equipment, dry cleaning with compressed air or blowers may be preferable. Some disinfectants may have some efficacy or residual activity in the presence of small amounts of organic material (e.g., phenols) and should be considered in circumstances where complete removal of organic debris is difficult but the phenols still must penetrate any organic material present. However, application of these products to a heavy organic load (e.g., non-cleaned surfaces) will not likely be effective.

Additional factors affecting cleaning and disinfection efficacy should be considered:

- **Surface type:** Porous, uneven, cracked, or pitted surfaces, especially wooden surfaces and earthen floors, are difficult to disinfect. Some chemical disinfectants may also be incompatible with or corrosive to certain materials or surface types (e.g., metal, rubber, plastic). Due to the construction and presence of uneven surfaces on equipment, equipment cleaning and disinfection

procedures can be difficult. Heat may be a more effective method for inactivating the virus on these surfaces.

- **pH:** The activity of some disinfectants is also affected by pH because it changes the degree of ionization of a chemical disinfectant, thereby impacting efficacy. For example, the efficacy of phenols, acids, and hypochlorites are decreased as pH increases; in contrast, quaternary ammonium compounds have greatest efficacy as pH increases.
- **Water quality:** The water quality used when diluting and applying detergents and disinfectants is important. Water hardness can inactivate or reduce the effectiveness of certain disinfectants (e.g., quaternary ammonium compounds). Be sure to consider any standing water or other water sources (e.g., rainfall) present that may immediately dilute the disinfectant during application
- **Temperature:** Some disinfectants are less effective or ineffective at low temperatures (e.g., cold weather conditions). Additionally, disinfectant solutions may freeze outdoors under low temperature conditions. When possible, buildings and equipment should be heated to approximately 68°F (20°C) when applying disinfectants. Elevated temperatures can aid in microorganism destruction; however, higher temperatures can also accelerate decomposition or evaporation of a disinfectant, thereby reducing the necessary contact time and efficacy. Excessive heat may also damage items being disinfected.
- **Weather:** Inclement weather conditions (e.g., cold, rain, wind) may also make these procedures difficult.

Basic C&D Protocol

The basic C&D protocol, regardless of item involved, is as follows:

1. **Dry clean:** Remove any gross contamination and organic material.
2. **Wash and rinse:** Wash item with a detergent solution to further remove organic debris. Inspect for cleanliness and repeat wash procedure if not clean.
3. **Dry:** When possible complete drying of the items should occur before disinfectant application
4. **Disinfection application:** Apply an EPA-registered disinfectant. Follow the manufacturer directions for concentration and contact time of disinfectants. Ensure all areas are covered thoroughly with the solution and remain “wet” with the solution for the necessary contact time. Apply disinfectant a second time if necessary.
5. **Rinse and dry:** Rinse equipment thoroughly with clean, warm water. Thorough rinsing can be very important as some disinfectant solutions may cause damage to surfaces (e.g., deterioration of rubber or corrosion of metal parts), if not completely rinsed away. Allow items(s) to air-dry.

For all of the procedures above, ensure that run-off water is captured or denatured to prevent virus or chemical contamination of the environment.

Fresh solutions should be prepared prior to use; some disinfectant solutions may only be active for the same day of preparation. Failure to make fresh solutions may result in using a product that has reduced efficacy. Testing the disinfectant to determine if chemical degradation of the active ingredients has occurred and that diluted solutions contain the necessary amount of active ingredient may be helpful. Maintain an operating log, noting the temperature of wash and rinse waters, and detergent and sanitizer concentrations.

Consideration of Surfaces Being Disinfected

Metal surfaces (e.g., stainless steel, aluminum) are generally easier to disinfect than other materials, especially when the surfaces are smooth. However, some chemical disinfectants are incompatible or corrosive with metal surfaces (see table below). Flame guns or other thermal methods may be useful alternatives for some metal surfaces.

Chemical Disinfectant	Effect on metal surfaces
Sodium hydroxide	Corrosive to aluminum and derived alloys, and galvanized metal
Sodium carbonate	Corrosive to aluminum and derived alloys
Acids	Highly corrosive to metals
Glutaraldehyde, Virkon [®] S	Mildly corrosive to metals
Iodophors, hypochlorites, formaldehyde	Corrosive to some metals
Phenolics	Relatively non-corrosive

Rubber and plastics should be treated as hard, nonporous surfaces, however they may have interactions with some chemical disinfectant products (e.g., phenols, sodium hydroxide). Iodophors may cause staining of these materials and can be corrosive to some plastics or rubber. Alcohols can swell or harden rubber or certain plastic tubing after prolonged and repeated use. Excessive heating can melt most plastics.

Wood is extremely porous and therefore difficult to disinfect. Any decaying wood surface that cannot be disinfected should be removed, and disposed of appropriately (e.g., burn or burial). Wood surfaces should not be rinsed, soaked, or sprayed with plain water prior to washing or disinfectant application as this can cause unintended dilution; dry cleaning with appropriate downtime may be adequate and preferable. A disinfectant solution of a product registered for wood surfaces should be applied once gross organic debris has been removed.

Footwear disinfection procedures should follow basic C&D protocol when entering and exiting facilities. Remove organic matter (scrub brush); wash and rinse, or use dry disinfectants such as heat. Contact time with disinfectant solution is essential. Footwear disinfection stations should be set up at entry sites. Everyone is required to clean and disinfect their footwear or wear site-provided footwear or new footwear covers prior to entering production facilities, or processing areas. Wet footbaths must be changed at least daily or more often if the footbath collects dirt or manure and protected from the elements, freezing and dilution.

Minimizing Human Exposure

Most disinfectants can cause irritation to eyes, skin, and/or the respiratory tract; some may cause burns or other injury. The safety of all personnel must be paramount when handling, mixing, and applying chemical disinfectants. Appropriate PPE (e.g., gloves, goggles, masks) should be worn. It is essential that C&D personnel are trained on the proper mixing and application procedures as well as the hazards of the products they will be using. Always read the label for any safety concerns to people, animals, or the environment.

References:

- USDA APHIS. Foreign Animal Disease Preparedness and Response Plan Guidelines: Cleaning and Disinfection. 2014 Jul. Available at:

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Appendix K: Setting up and Operating a Cleaning and Disinfection (C&D) Station

Effective disinfection of equipment and vehicles requires thorough cleaning, application of an effective disinfectant, maintaining appropriate temperature (consider ambient temperature), and time for the disinfectant to work (consult disinfectant labels to determine the contact time necessary for virus elimination/inactivation).

Establish the C&D Station

Cleaning and disinfection procedures for vehicles entering the PBA should mitigate the potential risk of bringing a virus onto the farm, and may be similar to the following:

- **Soak** the most visibly contaminated areas to aid in washing removing organic materials on tires, wheel wells, undercarriage, mud flaps, splash guards, and steps.
- **Wash**, wipe, spray or scrub the areas with excess organic matter starting with the dirtiest and working towards the cleaner areas.
 - Pressure washers can enhance organic matter removal.
 - Ensure that the spray and wash water run-off from the vehicle does not reach poultry holding/housing areas as AI virus in organic matter could result in animal exposure.
- **Rinse** and remove all detergent/soap residues by applying a low pressure water rinse on all surfaces, starting with the top of the vehicle and working down.
- **Read** the product label on the disinfectant and handle the solution correctly to ensure safety of the handler and effectiveness of the disinfectant. Personal protective equipment may be needed to mix up and apply solutions.
 - Note the recommended dilutions, water temperature, environmental temperature, and the need for ventilation when using the product.
- **Disinfect** by applying the product to the cleaned areas of the vehicle, starting with the tires to maximize contact time before moving.
 - The vehicle can be slowly rolled forward to allow the disinfectant to contact all parts of the tires.
 - Ensure that the product has adequate wet contact time (per label directions) with all surfaces to inactivate the virus. Solution must remain 'wet' to actively work; reapplication may be necessary.

An example SOP is below for wearing protective gear, inspecting, cleaning and disinfecting vehicles. Modify to meet your specific site needs.

Setting up the C&D Station (2+ personnel required)

1. Set up C&D station outside or adjacent to PBA. Maintain C&D station free of dirt, manure and other contaminants. Ensure the C&D station is not adjacent to poultry housing.
2. Provide and properly maintain vegetative filter area around C&D station for wash water runoff. Manage runoff so that it does not enter animal housing, drive paths, flowing streams, ditches or other avenues that leave the site. Follow state or local regulations regarding management of effluent.
3. Make sure the following supplies are available and can last four days minimum, stored out of the elements, and refilled when low
 - a. Rubber gloves (2 pair for each person, each washing)

- b. Waterproof outerwear covering street clothing, skin, head, neck (2 sets in sizes ...)
 - c. Safety glasses or goggles (2 pairs)
 - d. Protective footwear (in sizes: _____) that remain at the C&D station
 - e. Plastic garbage bags for disposal of gloves
 - f. NAME OF DISINFECTANT: _____
 - g. Water (60 gallons per vehicle)
 - h. Pressure washer
 - i. Fuel or power source for pressure washer
 - j. Long handle brush (2)
 - k. Timer for disinfectant contact times
 - l. Vehicle log sheet with pens
4. Maintain a supply inventory log and written plan for restocking supplies, including names, addresses and other contact information for suppliers and the means by which supplies are delivered to the company or transporter/driver in a timely manner
 5. Mix the (NAME OF DISINFECTANT: _____) solution fresh daily.
(Example: Citric acid disinfectant 3% solution is 13 pounds of 99% food grade anhydrous powder to 50 gallons of water). Mix thoroughly.
 - a. Wear protective gear when mixing up solution. Read label to see if there are other personal protections you need to take with this disinfectant.
 - b. Do NOT mix or use any other disinfectant with bleach or chlorinated products
 6. Maintain a Vehicle C&D log. It is recommended that the log is available for review by Responsible Regulatory Officials if requested.

Putting on (Donning) Protective Gear at C&D Station

1. Select the appropriate personal protective equipment (PPE) for the given disinfectant (consult the label for more information).
2. Inspect all protective gear for damage or contamination; do not use unless intact and clean.
3. Consider safety and efficacy of disinfectant during inclement weather
 - a. Protect susceptible disinfectants from sunny or hot conditions
 - b. Shield personnel from blowing disinfectant during windy weather.

Inspecting and Cleaning Vehicles

1. Wash down the wash pad surface to remove mud/manure before vehicle enters
 - a. Monitor wash effluent to ensure it enters a vegetative area or other contained location and does not cross the pavement
 - b. If crosses, build a berm to hold it within the wash area
2. Guide vehicle to concrete wash pad
3. Driver remains in vehicle
4. Record vehicle entry details on log sheet
 - a. Origin of vehicle, driver name, contact number, vehicle identification, previous and next stop (name and location)
5. Walk around and visually inspect the exterior of vehicle for contamination, focusing on the tires, wheel wells, undercarriage, mud flaps, splash guards and steps
6. If exterior is visibly contaminated, soak the dirty areas with water and soap
 - a. Have driver move vehicle forward slightly to ensure tire contact surface is cleaned
 - b. Scrub heavily soiled areas
7. Pressure wash off the soap and visible contamination
8. Rinse with low pressure water working from the top of the contaminated area down

Disinfecting Vehicles

1. Apply the (NAME OF NONCORROSIVE DISINFECTANT: _____) to the cleaned areas of the vehicle, starting with the tires to maximize contact time before moving
 - a. Have driver move vehicle forward slightly to ensure disinfectant contact with the entire tire surface
2. Allow the (NAME OF NONCORROSIVE DISINFECTANT: _____) to contact the surfaces for _____ minutes (start time upon first application) to inactivate the virus
 - a. Solution must remain 'wet' to actively work; reapplication may be necessary
3. Wash down drive path area where wash water/run off traveled
4. Apply (NAME OF NONCORROSIVE DISINFECTANT: _____) solution to drive path where wash water/run off traveled and allow _____ minutes of wet contact time
5. Allow vehicle to enter site; ensuring gate is closed after vehicle has entered.

Removing (Doffing) Protective Gear at C&D Station

1. Water rinse off protective gear from top to bottom to remove any potential contamination from outerwear, gloves, and footwear
2. Remove personal protective equipment (PPE); PPE should be removed in the following order (if present): face shield, gloves, protective outerwear, and protective footwear. Store reusable items in a protected location near the C&D station to be worn upon next vehicle C&D, or dispose of items in a garbage bag.
3. Put on clean protective site-dedicated footwear before leaving C&D station, at the Biosecure Entry Procedure
4. Remove all disposable PPE and dispose of properly

Vehicles Exiting Site

1. Proceed to exit, wait for individuals working on the site to open gate, and leave site
2. Individuals working on the site will close gate upon vehicle exit and record departure information on Vehicle, Equipment Entry Log

Example* C&D Station Supply Inventory Log

Minimum 4 day supply, maintain in good condition, inventory every 6 months

Farm Name: _____ Farm PremID (PIN): _____
Address: _____ Contact Name: _____ Phone: _____

Supplies	Inventory Date	Current Amount/ Sizes	Supply Order Invoice #	Purchased From	Additional Info (make, model#)	Initials
Rubber Gloves						
Waterproof outerwear						
Safety glasses/ goggles/ face shields						
Protective footwear						
Water storage						
Pressure washer & fuel/propane						
Timer						
Waste Receptacle						
Long handle brush						
Disinfectant						
Light source with power cord						
Signage						
Barrier Gate(s)						

*Note that this form is just an example and may not necessarily meet the requirements of the Responsible Regulatory Official or the needs of the producer.

Appendix L: Using Heat Treatment to Disinfect Poultry Houses

Heat treatment for disinfection of poultry houses is an effective method for elimination of pathogens, including high pathogenicity avian influenza virus. Any method selected should consider specific characteristics of the premises/houses and other factors which may impact the effectiveness of disinfection; heat treatment may not be appropriate in all situations. Some factors to consider include weather, temperature, relative humidity, UV light, remaining organic material, pathogen strain, and type of surface material (wood, concrete, etc.). For more information considering surfaces being disinfected, see [Appendix J](#). Equipment damage or degradation (e.g., lubricants, hydraulic fluids, oil) can occur. Extremely hot and cold temperatures can also crack or damage electronic components.

Dry cleaning must be completed prior to disinfection (whether heat treatment or chemical). This includes removal of gross contamination and organic material. Heat can be applied under moist (e.g., steam) or dry (e.g., baking) conditions. When heat treatment is used for disinfection, temperature monitoring is required. Thermometers should be placed in each barn or house; at least one at each end and one in the center; more are recommended for larger facilities. Thermometers should be checked for accuracy before being placed in poultry houses during heat treatment. Placement of thermometers should be at 4-6 feet high for turkeys and at cage level for layers. Do not place sensors near or on an individual heat source. In addition, temperature logs should be maintained indicating the temperature of the house at regular intervals (recommend 2-4 times daily). Documentation should indicate that the barns/houses are reaching and maintaining appropriate temperatures.

Most vegetative bacteria are inactivated at moist-heat temperatures of 131-149°F (55-65°C). Many viruses are labile at temperatures close to 158°F (70°C). Several research studies have evaluated the effect of heat on the avian influenza virus. AI viruses can be harbored in both wet and dry feces for extended periods of time. Virus elimination of HPAI in poultry houses may be achieved by heating the house to 110-120°F for 7 days, with at least 3 consecutive days continuously maintaining a temperature within this range. The following table is adapted from the USDA document, “Using Heat Treatment for Virus Elimination”, available at:

https://www.aphis.usda.gov/animal_health/emergency_management/downloads/hpai/heattreatment.pdf; this document includes additional materials and persistence at lower temperatures.

Material	Temperature (°F)	Duration
Liquid feces ^a	68	7 days
	77-89.6	4 days
Dry feces ^a	N/A	14 days
Wet and dry feces ^b	107.6	18 hours
Dried egg white ^c	152.6	20 hours
	129.9	21.4 days
Feathers ^d	68	15 days
Soil ^e	41	365 days
	71.6	49 days
Surfaces (e.g., steel, tiles, tire, plastic, etc.) ^e	N/A	3 days

References:

^a World Organization for Animal Health (OIE), 2009, OIE Technical Disease Card.

^b Baleshwari Kurmi et al., 2013. “Survivability of High pathogenicity Avian Influenza H5N1 Virus in Poultry Faeces at Different Temperatures.” Indian J. Virol. 24(2):272-277. DOI 10.1007/s13337-013-0135-2.

^c OIE, 2014, Terrestrial Animal Health Code. Chapter 10.4: Infection with Avian Influenza Viruses.^e USDA, 2015. “Reduction of Infectious HPAI in Animal Agricultural Settings.”

^d USDA, 2015. “Reduction of Infectious HPAI in Animal Agricultural Settings.”
https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/ai/hpai-reduction-of-infectious.pdf.

^e M. Ellin Doyle et al., 2007. “Destruction of H5N1 Avian Influenza Virus in Meat and Poultry Products.” UW-FRI Briefings. https://fri.wisc.edu/files/Briefs_File/FRI_Brief_H5N1_Avian_Influenza_8_07.pdf.

Appendix M: Public Health Toolkit for Avian Influenza

The following pages contain a series of factsheets containing educational materials for poultry producers, responders, and anyone who may have been exposed to a zoonotic (or potentially zoonotic) strain of Avian Influenza (AI). Avian Influenza A viruses do not normally infect people. However, sometimes influenza A viruses that normally infect poultry and can spread among birds can cross over and cause illness in another species, including humans. Rarely, human infections with AI viruses can happen when virus in the air from droplets or dust is inhaled or ingested by a person in close contact with affected poultry or an avian influenza A virus contaminated environment. The spread of AI viruses from one sick person to another has been reported very rarely, but because avian influenza A viruses could change and gain the ability to spread easily between people, monitoring for human infection is very important. The following factsheets should be customized to include contact information for the Department of Public Health in your state. More information can be found at the Centers for Disease Control and Prevention website: <https://www.cdc.gov/flu/avianflu/avian-in-humans.htm>.



BACKGROUND ON HUMAN HEALTH RISKS ASSOCIATED WITH AVIAN INFLUENZA

- **What is Avian Influenza?**
 - Avian Influenza, or AI, is a virus that is spread easily between birds, and can make them very sick.
- **Should I be worried about my health if I am exposed to poultry on a farm infected with Avian Influenza?**
 - Although rare, Avian Influenza virus may spread to humans.
 - Some people are at higher risk for infection with Avian Influenza virus, including people who are pregnant, have weakened immune systems, or are more than 65 years old.
- **How might I get Avian Influenza virus?**
 - The virus is shed in the saliva, mucous, and feces of infected birds.
 - Most commonly, infection occurs through direct contact between infected birds and people. Occasionally, people may also become infected if enough virus gets into their eyes, nose, or mouth; or if they inhale the virus.
- **How can I protect myself from getting sick?**
 - Infection is rare if proper PPE is used. Persons working with infected birds should follow proper PPE recommendations.
 - Public Health will also be working with you and may require monitoring of your health. You may also be advised to take an antiviral, such as Tamiflu. It is important that you follow all public health guidance to keep yourself healthy.
- **What is the risk to my family?**
 - Occasionally, Avian Influenza viruses can change, and may gain the ability to spread from person to person. Usually, infections are not sustained and are self-limiting.

For more information, contact your state's Department of Public Health
Phone: _____



WHAT POULTRY PRODUCERS CAN DO TO PREPARE FOR AN AVIAN INFLUENZA OUTBREAK

WHAT YOU CAN DO TO PREPARE FOR A POSSIBLE AVIAN INFLUENZA OUTBREAK ON YOUR FARM:

- ☐ Educate your employees on:
 - What would happen in an Avian Influenza outbreak
 - Why they should be concerned with protecting their own health during an Avian Influenza outbreak
 - How to prevent spreading the virus from birds to people
 - How to properly use Personal Protective Equipment (PPE), including how to don (put on) and doff (remove) it, and proper disposal of PPE
- ☐ Ensure access to PPE for yourself and your employees
 - Make sure to include access to N-95 respirators that have been properly fit tested for your employees
- ☐ Encourage your employees to get a seasonal flu vaccine, which may help reduce chances of infection or severity of symptoms

For more information, contact your state's Department of Public Health
Phone: _____



WHAT POULTRY PRODUCERS MAY EXPECT FROM PUBLIC HEALTH DURING AN AVIAN INFLUENZA OUTBREAK

WHAT YOU CAN EXPECT FROM PUBLIC HEALTH:

- State and Local Public Health may provide education on the possible human health impacts of the influenza strain found on your farm.
- Public Health may provide recommendations for use of personal protective equipment (PPE).
- Public Health may monitor your and your workers' health via call, text messaging, or email for ten days after the last unprotected exposure to sick birds and/or contaminated areas to ensure everyone stays healthy.
- Public Health may provide a 24/7 phone number to call if illness begins or if there are any questions (if illness begins public health will help determine whether you should be tested and make treatment recommendations).

WHAT PUBLIC HEALTH WILL EXPECT FROM YOU:

- Public Health may require a list of people working on the infected farm (including volunteers, family members, and paid employees).
- Public Health will expect people working on the infected farm to cooperate with health monitoring.
- Public Health expects to be notified of all illness.

For more information, contact your state's Department of Public Health
Phone: _____



SYMPTOMS OF AVIAN INFLUENZA IN PEOPLE

Anyone exposed to an infected farm (including volunteers, family members, and paid employees) should monitor their health for the following symptoms:

- Fever
- Cough
- Shortness of breath
- Sore throat
- Muscle aches
- Conjunctivitis (redness, swelling, and pain in the eyes and eyelids)
- Diarrhea

Monitoring for these symptoms should continue until 10 days after the last time you were in contact with the infected farm.

If you get any of these symptoms, call your state's Department of Public Health:

- Phone during business hours: _____
- Phone after hours (ask for public health): _____

If you develop serious symptoms, seek emergency care immediately and tell them that you have been exposed to Avian Influenza.

For more information, contact your state's Department of Public Health
Phone: _____

Personal Protective Equipment (PPE) Recommendations for All Persons Working on Farms Infected with Avian Influenza*



PERSONAL PROTECTIVE EQUIPMENT RECOMMENDATIONS FOR ALL PERSONS WORKING ON FARMS INFECTED WITH AVIAN INFLUENZA

- ☐ Know how to properly put on and remove PPE in the correct order:

DONNING:				DOFFING:
1. Tyvek suit				1. Boots
2. Boots				2. Gloves
3. Respirator				3. Goggles
4. Goggles				4. Respirator
5. Gloves				5. Tyvek suit

- ☐ Make sure you are wearing the correct PPE:
 - Gloves
 - Tyveks
 - Boots or boot covers
 - Head or hair covers
 - Safety goggles
 - Face shield
 - N-95 respirator (special mask needed for avian influenza)

PPE should be disposable OR able to be disinfected.

- ☐ You can purchase PPE at farm supply stores, home improvement stores, or via distributors.
- ☐ Know how to properly dispose of used PPE.
- ☐ Shower at the end of the work shift.
- ☐ Leave all contaminated clothing and equipment at the site.

For more information about PPE visit:

<https://www.cdc.gov/niosh/docs/2008-128/pdfs/2008-128.pdf>

For more information, contact your state's Department of Public Health
Phone: _____

*Appropriate procedures for donning (putting on) and doffing (taking off) PPE should be followed to ensure AI virus is not carried off of the premises; individuals should follow site-specific protocols and biosecurity procedures. More information can be found at: <http://www.cfsph.iastate.edu/Emergency-Response/Just-in-Time/04-PPE-Donning-HANDOUT.pdf> and <http://www.cfsph.iastate.edu/Emergency-Response/Just-in-Time/04-PPE-Doffing-HANDOUT.pdf>.



ANTIVIRAL RECOMMENDATIONS FOR PERSONS WORKING ON FARMS INFECTED WITH AVIAN INFLUENZA

- Antiviral medication may be given to anyone exposed to an infected farm (including volunteers, family members, and paid employees) to prevent infection with influenza.
- If you have been exposed to Avian Influenza, talk to your healthcare provider. He or she will decide if you need antiviral medication.
- Your healthcare provider will want to know if you have any health conditions, since some conditions may increase your risk of complications from avian influenza infection.
- The risk of complication from avian influenza infection may be higher in young children (under two years old), adults over 65 years old, and women who are pregnant or have recently been pregnant.
- Antivirals are not routinely recommended for persons who used proper PPE or who are involved in culling non-infected birds.
- If your healthcare provider recommends antiviral medication for you, you should take it for five days from the last known exposure.
- Antiviral medications for prevention of influenza include oseltamivir (Tamiflu), which is taken by mouth, or zanamivir (Relenza), which is inhaled.

For more information, contact your state's Department of Public Health
Phone: _____