

# Conveyance Contamination

## (WAL Security Procedure 4.6)

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# Conveyance Contamination

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## Introduction

This document illustrates how several types of contaminants may spread through the carrier conveyances. The document also explains the reasons for U.S. Customs and Border Protection's (CBP) efforts to prevent invasive species from entering the United States and ways for industry to avoid contaminated conveyances.



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## What is Carrier Conveyance Contamination?

- Carrier conveyances, such as ocean containers, aircraft, rail cars, and commercial trucks, are pathways by which invasive plant and animal pests and diseases might be introduced into the United States.
- The economic and environmental impact of such unintentional introductions can be significant. Invasive species are expensive to control and can reduce agricultural production, property values, and water availability.
- There are approximately 1,050 invasive plant species reported in the United States.



Soil contamination on military vehicle.



Animal blood leaking from a reefer arriving from foreign.

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## Contaminants Defined

- Contaminants are unwanted substance(s) or foreign material in a physical body or in the environment that can cause serious harm to United State's agriculture and natural resources.
- Biologists consider accidental introduction of contamination a serious threat to United States agriculture and natural resources.
- For CBP agriculture specialists, these contaminants are viewed as agriculture and environmental threats, just as terrorists are security threats.
- Contamination is found in all pathways: sea, air, land and rail. Conveyance contamination is found on regulated agricultural commodities and general cargo of all types, not just perishable agricultural commodities.



## Examples of Carrier Conveyance Contamination

### Federal Noxious Weed Seeds



*Tridax procumbens* Linnaeus found in an ocean container of tubing that arrived by rail.



*Saccharum spontaneum* Linnaeus (Poaceae) found arriving in a container at Detroit.

- A federal noxious weed is an invasive plant species introduced into a non-native ecosystem likely to cause harm.
- Invasive weeds are a leading cause of crop loss, causing billions of dollars of loss each year.
- There are an estimated 2,000 invasive and noxious weeds established in the United States.

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## Examples of Carrier Conveyance Contamination

### Wood Packaging Material (WPM) Contaminated with Federal Noxious Weed Seeds



*Imperata cylindrica* (Congograss) found on WPM in an ocean container of ceramic pottery.



*Imperata cylindrica* found on WPM in an ocean container of ceramic tiles.

- Congograss first arrived accidentally in Louisiana in 1912 on WPM.
- It forms dense stands that crowd out native species.

## Examples of Carrier Conveyance Contamination

### Crate and Vehicle Contaminated with Federal Noxious Weed Seeds



*Imperata cylindrica* (Linnaeus) found on crates of slate imported via rail.

*Saccharum spontaneum* Linnaeus found on the undercarriage of military vehicle.

- *Saccharum spontaneum*, or wild sugarcane, is native to India, and is now distributed widely in tropical and subtropical regions of Asia.
- Wild sugarcane can establish rapidly because it produces copious amounts of seeds dispersed by wind and lay dormant waiting for proper conditions for germination.

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## Examples of Carrier Conveyance Contamination

### Truck Grill Contaminated with Federal Noxious Weed Seeds



Grill of contaminated commercial truck entering a land border port of entry (Tucson AZ).

*Tridax procumbens* Linnaeus found on the grill of a truck (Tucson AZ).

- *Tridax procumbens*, or coat buttons, is native to the tropical Americas, but has been introduced to tropical, subtropical, and mild temperate regions worldwide.
- Introduction into the U.S. primarily occurs via land border pathways on non-agricultural commodities such as WPM and carriers.

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## Examples of Carrier Conveyance Contamination

### Hitchhiking Pests and Plant Debris



Photo of snail on the exterior of a container.



Hay contamination on floor of a container.

- Hitchhiking pests can be found on commodities that they are not generally known to feed on.
- Similarly, hitchhiking pests may be found on conveyances where no known hosts exist.
- Pests may simply “hitch” a ride on the conveyance because the conveyance may have been near or on a host.
- Plant debris might contaminate a conveyance as residual matter from previous shipments.
- Hitchhiking pests and plant debris pose agricultural risks because they are pathways for invasive species.

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## Examples of Carrier Conveyance Contamination

### Hitchhiking Pests: Exterior of container contaminated with a hitchhiking snail



Far view of a container with a hitchhiking snail.

Close-up view of hitchhiking snail on the same container.

Temperate terrestrial gastropods, such as snails and slugs can:

- Cause damage by feeding on agricultural and horticultural crops as well as native plants, reducing crops and crop quality;
- Transmit pathogens to humans indirectly when humans consume vegetables and fruits contaminated by snails and slugs;
- Transmit pathogens of both plants and livestock in their feces and displace native species of snails and slugs.

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## Examples of Carrier Conveyance Contamination

### Hitchhiking Pests: Mollusks contaminating interior and exterior of maritime containers



A slug in the interior of the container near the base of a pallet of ceramic tile.



A snail on the undercarriage of a container of steel coils.

- Members of the family Hygromiidae are pests of fodder crops and are considered serious pests in Europe.
- White snails are considered by many agricultural authorities as among the more serious molluscan pests.
- White snails are pests on seedling crops such as wheat, barley, oil seeds, peas, beans causing total destruction.
- Livestock will refuse to feed on pasture and hay that are heavily contaminated by the slime trails.

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## Examples of Carrier Conveyance Contamination

### Hitchhiking Pests: Exterior of aircraft contaminated with hitchhiking bees



Swarm of bees on exterior of aircraft.

- Beekeeping is an essential component of modern U.S. agriculture, providing pollination services, adding \$15 billion in value to more than 90 commercial crops.
- Since the 1980s, however, a number of factors have led to the declining health of U.S. honeybee colonies. For example, several honeybee pests, such as the small hive beetle, Varroa mite, tracheal mite, and single-celled gut parasite *Nosema ceranae* (bee parasites) can damage honeycomb, stored honey and pollen.
- Honeybees also face newly introduced diseases caused by viruses, bacteria and fungi. A swarm of bees hitchhiking on an aircraft or a vessel is one way for these parasites to reach local honeybee colonies.

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## Examples of Carrier Conveyance Contamination

Plant Debris: Container undercarriage contaminated with wheat seeds



Wheat seed contamination on the undercarriage of a container.



Same contamination on a different container.

- Karnal bunt, caused by the fungus *Tilletia indica* Mitra, is a wheat disease.
- Karnal bunt was accidentally introduced into the United States, decades ago, on contaminated seed.
- Karnal bunt presents an export problem because it's considered by some U.S. trading partners to be a quarantine pest.
- Many U.S. trading partners will not accept U.S. wheat unless it's certified to be from areas of the U.S. where Karnal bunt is not known to occur.

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## Examples of Carrier Conveyance Contamination

### Soil Contamination



Soil contamination on used forage harvester imported from Argentina.



Soil contamination on imported steel coils.

- APHIS regulations protect the health and value of American agriculture and natural resources from the introduction of destructive plant and animal diseases and pests.
- Soil is always prohibited as a contaminant.

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## Examples of Carrier Conveyance Contamination

**Soil Contamination: Containers and trailers contaminated with soil**



Soil contamination on a trailer.



Soil contamination on a container floor.

Contamination from soil can be an unintentional pathway for:

- Animal and plant viruses
- Bacteria
- Fungi
- Nematodes
- Noxious weed seeds
- Various life stages of destructive insects
- And other contaminants, like plant debris (pictured on the right).

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## Examples of Carrier Conveyance Contamination

### Soil Contamination: Military vehicle and farm equipment contaminated with soil



Soil contamination on a military vehicle.



Soil contamination on farm equipment.

- An animal can become infected after contact with as few as 10 virus particles in soil.
- The virus can survive in the soil for more than a month.
- Soil contamination on farm equipment from a country is a viable pathway for the introduction of the virus to a farm where the virus does not exist.

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## Examples of Carrier Conveyance Contamination

### Fomites of Foreign Animal Disease



Animal manure contamination  
on a maritime vessel.



Animal blood contamination on the floor of a container.

- Fomites are inanimate objects capable of transferring disease agents through either direct contact or oral transmission.
- Fomites can include boots, clothing, vehicles, shovels, tools, bowls or buckets, tack, etc.
- Vehicles and trailers with contaminated tires, wheel wells, and undercarriages can serve as fomites.
- Humans with contaminated clothing or shoes are also considered fomites with the potential for moving disease agents within the facility or from one facility to another.
- Examples of diseases spread by fomites include African swine fever, classical swine fever, foot-and-mouth disease, or influenza.

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## Examples of Carrier Conveyance Contamination

Fomites of Foreign Animal Disease: Military vehicle contaminated with bird's nest



Bird's nest found on a military vehicle.



Bird's nest closer view.

- A bird nest was found on a military vehicle shipped to the United States from Afghanistan.
- Afghanistan is recognized by the U.S. Department of Agriculture as being affected with Newcastle disease and highly pathogenic avian influenza (HPAI).

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## Examples of Carrier Conveyance Contamination

**Fomites of Foreign Animal Disease: Vessel contaminated with animal manure, used straw, and feed**



Animal manure on the top deck on cattle loading ramps.



Used straw and feed on other stored equipment.

- Clean conveyances after cargo has been offloaded, and before more cargo is loaded.
- Ensures that contaminated fomites are not disseminated into the environment.

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## Examples of Carrier Conveyance Contamination

### Asian Gypsy Moths (AGM)



AGM egg masses on vessel moorings.



AGM egg masses on vessel superstructure.

- AGM females lay egg masses that yield hundreds of caterpillars that can defoliate over 500 species of trees and shrubs.
- Egg masses are yellowish or whitish fuzz and average about 1½ inches long and ¾ inch wide but can be as small as a dime.
- Spread and establishment of AGM is enhanced by the AGM female ability to fly up to 25 miles, a large host range, adaptation to colder climates, and the ability of egg masses to tolerate extreme temperatures and moisture.
- AGM egg masses are also found on the exterior of shipping containers, and on bulk or loose cargo, such as steel pipes.

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## Examples of Carrier Conveyance Contamination

### Wood Packaging Material (WPM)



CBP intercepting a wood-boring pest in a wooden pallet.

- Aside from the unintentional introduction of pests via contaminants and as hitchhikers, some commodities are shipped with wood packaging material that is infested with wood-boring pests.
- Wood-boring insects cause more than \$3.5 billion annually in losses.
- Of all invasive insect species detected from 1980-2006, 56% were wood-borers.

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## CBP Inspection and Safeguarding Efforts

### CBP Inspection for Federal Noxious Weed Seeds



CBP agriculture specialists utilize a yard stick with tape attached at the end to inspect for noxious weeds seeds.

- CBP personnel are trained to recognize all types of contaminants through inspection of conveyances and the cargo being transported.
- Sometimes, novel inspection methods are developed and utilized to ensure thorough inspection.

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## CBP Inspection and Safeguarding Efforts

### CBP Inspecting the Inside of Containers for Contaminants



CBP sweeping container floor to inspect for and prevent the entry of contaminants.



CBP vacuuming and sweeping container floors to inspect for and prevent the entry of contaminants.

- At times, the inspection of conveyances for contamination requires creative use of ordinary tools, like a vacuum.
- Grooved container floors may shelter hitchhiking insects and noxious weed seeds. A vacuum allows for the removal of insects and weed seeds while minimizing possible dissemination.

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## CBP Inspection and Safeguarding Efforts

### CBP Inspecting the Outside of Containers and Cargo for Contaminants



CBP pointing at a snail on the exterior of a shipping container.



Salt barrier surrounding a container found to be contaminated with snails.

- Like AGM, snails may attach to containers and bulk or loose cargo.
- CBP personnel inspect the exterior of containers for hitchhiking pests-not just the interior.
- If hitchhiking snails are found, salt barriers are used to prevent the movement of the snails.

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## CBP Inspection and Safeguarding Efforts

### CBP Inspecting Vessels for Contaminants



CBP conducting AGM vessel inspections.



A personnel reporting inspection results.

- CBP inspects vessels for AGM egg masses.
- Hand mirrors are used to inspect in certain areas, such as behind light fixtures, where the moths may be attracted and seek shelter from the elements.

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## CBP Inspection and Safeguarding Efforts

### CBP Inspecting WPM for Contaminants



CBP inspects a wood pallet for federal noxious weed seeds.



CBP peels the bark from a wood pallet to inspect for bark beetles.

- CBP personnel inspect wood packaging material for contaminants, such as pests, and compliance with the wood packaging material regulation (7CFR319.40).
- Flashlights are a useful tool when examining a wood pallet for federal noxious weed seeds.
- If CBP personnel find bark, and/or indications of insect presence, a wood pallet may be broken down for further inspection.

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## Impact to Trade Resulting from Contamination: All Types

- Carrier conveyances found with contaminants will remain on hold.
- If the contaminants require action to mitigate the risk of introduction, an emergency Action Notification (EAN) will be issued.
- The EAN specifies the type of action required treatment, re-exportation, destruction or other remedial measure, such as steam cleaning.
- There is a very real impact to trade when conveyances are found contaminated.
  - delays for cargo release
  - demurrage charges due to cargo holds
  - expense of having your container quarantined, tarped, and treated or cleaned

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# Conveyance Contamination

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## Impact to Trade Resulting from Contamination: WPM

- WPM found infested with wood-boring pests will remain on hold.
- If United States Department of Agriculture determines that action is required to mitigate the risk of introduction, an EAN will be issued.
- The EAN will specify that the shipment must be re-exported, as per 7CFR319.40.
- Impact to trade when conveyances WPM are contaminated.
  - delays for cargo release
  - demurrage charges due to cargo holds
  - expense of having your container quarantined and re-exported

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# Conveyance Contamination

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## Best Practice for Industry

- To ensure carrier conveyances are free of Federal Noxious Weed Seed and soil contaminants:
  - Visually inspect the exterior and interior of conveyances for contamination prior to arrival in the United States.
  - Sweep, vacuum, or wash conveyances prior to loading and be cognizant that environmental factors, such as heavy rains, may increase the likelihood of soil contamination.
  - The first step to preventing conveyance contamination is to visually inspect the exterior and interior of conveyances.
  - Simple steps may be taken to ensure that the conveyance and cargo contained therein do not present a threat to U.S. agricultural resources.

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# Conveyance Contamination

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## Best Practice for Industry

- To ensure carrier conveyances are free of hitchhiking pests, AGM, and plant debris contaminants:
  - Ensure loaded cargo is clean and free of contaminants.
  - Monitor the cargo staging area to ensure the area is free from plants and plant pests. For example, snails might attach to cargo staged in a grassy area.
  - Monitor the cargo staging area to ensure the cargo is not under lighting that might attract insects and increase the probability of infestation.
  - Utilize baits, traps, or barriers to prevent infestations from occurring in the cargo staging area. For example, salt barriers may be used to protect against snail infestations.

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# Conveyance Contamination

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## Best Practice for Industry

- To ensure carrier conveyances are free of foreign animal disease fomite contaminants:
  - Avoid driving through manure or wastewater.
  - Park conveyances on paved areas away from livestock pens and pastures.
  - Sweep, vacuum or wash conveyances to remove fomites. This is very important between visits to animal production facilities.

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# Conveyance Contamination

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## Best Practice for Industry

- To ensure carrier conveyances are free of WPM with wood-boring insects:
  - Require compliant WPM in the exporter's contract.
  - Educate your supply chain on the regulatory requirements.
  - Explore alternatives to WPM.
  - Conduct a cost-benefit analysis when exploring alternatives.
- Non-compliant WPM can be a significant obstacle for freight export or import.
  - Ask the WPM provider if they are ISPM 15 compliant.
  - Provide information on the ISPM 15 standard.
  - Give them contact information regarding how to become compliant (websites, contact no.)
- Explore alternatives to WPM
  - Plastic or metal pallets.
  - Pallets and crating manufactured from manufactured wood products (OSB, plywood, cardboard).
  - Do a cost benefit analysis if considering alternatives to WPM.
  - Realize there is financial cost to the supply chain and potential ecological cost to the natural resources of the United States.

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## Benefits of Compliance

- Importers will have increased business certainty because a system of internal control helps to ensure compliant transactions.
- Fewer delays for cargo release and less demurrage charges due to cargo holds.
- Avoid the expense of having your container quarantined, tarped, and treated or cleaned.
- When you implement “best practices”, you assist CBP in their efforts to protect U.S. agriculture.
- Benefits to Industry
  - By implementing self-inspection practices for contaminants, importers demonstrate to CBP that they are committed to a trusted partnership with CBP to protect U.S. agriculture.
- In turn, compliance may result in
  - a reduction in CBP inspections for contaminants
  - fewer delays for cargo release
  - fewer demurrage charges due to cargo holds
  - avoidance of the expense of having your container quarantined, tarped, and treated or cleaned
  - This translates into substantial monetary savings.

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