UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE

CONTAINMENT GUIDELINES

For Nonindigenous, Phytophagous Mollusks

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CONTAINMENT GUIDELINES FOR NONINDIGENOUS, PHYTOPHAGOUS MOLLUSKS
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GUIDELINES FOR CONTAINMENT OF NONINDIGENOUS PHYTOPHAGOUS MOLLUSKS

I. PURPOSE OF THIS DOCUMENT:

These guidelines are a reference to help design, build, maintain, and operate a facility for nonindigenous, phytophagous mollusks: including *Cornu aspersum* (*Helix aspersa*, *Cryptomphalus asperses*), *Cantareus apertus* (*Helix aperta*), *Eobania vermiculata* (*Otala vermiculata*), *Helix pomatia*, and *Otala lacteal*. Field collections of these organisms may be contaminated with described and undescribed organisms such as plants, parasites, plant pathogens, entopathogens, and arthropods.

During inspections or re-inspections of your facility, United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ) personnel will review these guidelines and any risk mitigation instructions that may accompany your permit.

The inspection and permitting procedures of the USDA, APHIS, PPQ are intended to prevent the release of nonindigenous plant pests to the environment of the United States. Accidental or purposeful release of these organisms is a violation of the PLANT PROTECTION ACT and is subject to civil and/or criminal penalties and loss of permits.

Components of this Document:

To facilitate the processing of your permit application(s), your containment facility must meet the “Standards” listed in gray, shaded boxes. To help you meet these standards, ask biotechnology industries, university biosafety committees, and/or contractors for research hospitals and other research institutions to recommend specialized professional contractors. Professionals know state, local and federal laws that regulate construction, including the installation of emergency doors, incinerators, air intake and exhaust ducts, emergency lighting, plumbing, and many other features. APHIS, PPQ’s Containment Facility Scientists have little or no knowledge of these laws.

The “Suggestions” listed under each Standard are methods or equipment that are commonly used at this time to accomplish each containment standard. The design, construction and operation of your containment facility may vary, depending on the organisms you wish to contain, your research objectives, the functionality of your equipment and structural components, and your location.

USDA, APHIS, PPQ welcomes alternatives that are proven to meet or exceed the standards. To insure timely permitting, please review this document, and research design alternatives. Once design options are narrowed, call or email PPQ’s Containment Facilities staff at (301) 851-2046, or pest.permits@aphis.usda.gov and continue discussions as the facility is planned and built.

II. CONSTRUCTION STANDARDS FOR THE ENTIRE STRUCTURE

CONSTRUCTION STANDARD A. Locate the facility in areas with minimal human, agricultural and environmental risk. **Identify** the facility as dedicated and secure.

1. Locate the facility in areas relatively free of agricultural zones, high-risk microclimates (e.g. known flood zones) or other high-risk areas.
2. Install a 15 foot- wide strip of gravel and/or pavement from the foundation and around the containment building(s).
3. If possible, design the containment facility as a separate, dedicated building.
4. Install a fence 6 foot or higher around the facility at least 15 feet from buildings.
5. At the main entry to containment, post:
    - Containment director/ containment officer name and contact numbers.
    - A sign stating "ACCESS IS BY AUTHORIZED PERSONNEL ONLY".
    - Emergency telephone numbers.

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CONSTRUCTION STANDARD B. Design the **floor plan** to prevent escape of the contained organisms.

1. Install one primary entry/exit.
2. Build a vestibule at the primary entry.
3. If local building code allows, install a vestibule at each emergency exit.
4. Design the facility with laboratories and rearing rooms connected to a main laboratory.
5. Build restrooms outside of containment rooms. However, if restrooms must be built inside a containment room, use the same construction standards used throughout the facility and place the restroom close to low risk areas.
6. Build offices outside of containment areas.
7. Install a central closet for cleaning supplies.
8. Eliminate hiding places in the facility for snails. Keep facility clean, remove clutter and debris.
9. See section III. CONSTRUCTION STANDARDS FOR SPECIALIZED ROOMS for recommended features of the vestibules and showers/restrooms.

CONSTRUCTION STANDARD C. Construct **walls, ceilings and floors** that are impenetrable to the contained organisms, and will withstand repeated cleaning and decontamination.

1. Select materials that are impenetrable to the contained organisms.
2. Construct the walls and ceilings with building materials that resist moisture and withstand repeated decontaminations with bleach or other caustic solutions.
3. Paint the ceilings and walls with a light-colored, washable paint.
4. Install floors that are impenetrable to the organism and withstand repeated cleanings. Monolithic (in one-piece) floors, e.g. poured concrete, asphalt tile, chemically resistant

paint etc. are desirable. Wood floors are **not** acceptable.

5. Consider the installation of floor drains to collect liquid wastes for sterilization.
6. Seal junctions, holes or penetrations of walls, ceilings, and floors with plaster, caulk, or equivalent materials.
7. Suspended or dropped ceilings are **not** acceptable.

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CONSTRUCTION STANDARD D. If windows are necessary, install **windows** impenetrable to the contained organisms.

1. Install glazing in windows that resists breakage (double-paned glass, wire-reinforced glass, acrylic, etc.).
2. Install windows that do not open.
3. Seal joints between the windowsills, frames, etc. and walls with appropriate materials.
4. Store extra window panels nearby for emergency use.

CONSTRUCTIONS STANDARD E. Install **doors** that contain the organism and contribute to the security of the facility.

1. Install self-closing, steel doors throughout the containment structure.
2. Install thresholds and magnetic door frame gaskets that seal all doors with their frames
3. Install exterior doors that lock.
4. Emergency doors
   - Post signs on the exterior and interior of emergency exits stating USDA, APHIS, PPQ Containment Facility - Emergency Exit Only.
   - Insure emergency doors are not commonly used as an entrance (remove exterior handles, use doors with interior or internal hinges, etc.).
   - Install audible alarms that activate when emergency exit doors are opened.

CONSTRUCTION STANDARD F. Design and install **HVAC system** (Heating, Ventilation and Air Conditioning) that prevents escape of the contained organisms.

1. If possible, install an HVAC system dedicated to the containment areas. If not possible, then install filters to prevent organism escape from containment areas to areas or buildings outside of containment.
2. Install the following screens or filters over these air sources:
   - Internal exhaust vent - mesh screen. Filters and screen sizes should be appropriate to all life stages of the organism to be contained. Very small organisms require finer mesh screening.
   - External exhaust and intake vents - pore size of screen is determined by size of organism that the researcher must contain. If contained organism is infected with a pathogen, a HEPA filter (99.97% efficient) may be necessary.
   - Internal air supply- screen with pore size appropriate to prevent contained organism

from escaping into air system if air flows in wrong direction. To slow the clogging of the HEPA filters and the subsequent reduction in HVAC efficiency, ask your design engineer about dust filters placed in front of the HEPA filters.

3. Air movement within the facility should be zero or negative, **not** positive.
4. Seal connections in air ducts, vents, plenums, etc. with caulk or an equivalent material.
5. Install filters and screens in the HVAC system so they are easy to clean, decontaminate and replace.
6. Install tandem filters, parallel filters, or other configurations that allow one filter to be replaced while another supplies air.

CONSTRUCTION STANDARD G. Design and install an **electrical system** that maintains containment features under normal and emergency situations, and is impenetrable to the contained organisms.

1. Install a mechanism to indicate power failure.
2. Install an alternative power source (generator, battery bank, etc.) for use when normal power is lost or interrupted.
3. Install weatherproof electrical boxes, receptacles, light fixtures, switches, etc.
4. Seal electrical boxes, lighting, switches, wiring, conduit, etc., with appropriate materials (caulk, foam, etc.) that are impenetrable to the contained organisms and withstand repeated decontaminations with bleach or other caustic solutions.

CONSTRUCTION STANDARD H. Design and install a **plumbing system** to contain the organisms and remove liquid wastes.

1. Install a sink in the containment area for cleaning.
2. Install metallic screen of at least 1/8 inch (some organisms may require smaller) mesh in size, over all air sources and vents to prevent the escape of contained organisms.
3. Sterilize effluents from sinks, floor drains, etc. with steam or its equivalent before releasing them into the sewer system.

CONSTRUCTION STANDARD I. The following system is not a containment requirement, however if installed, insure that **vacuum cleaning or aspiration systems** prevent the escape of the contained organisms.

1. Use vacuum appliance only in facility.
2. Autoclave or sterilize vacuum filters and waste before disposal.

CONSTRUCTION STANDARD J. Install a **communication system** that allows communication between the interior and exterior of the facility and prevents organism escape.

1. Install a telephone(s) or intercom system.
2. Install a computer or Fax machine to allow for communication and data transfer to and from the containment facility.

III. CONSTRUCTION STANDARDS FOR SPECIALIZED ROOMS.

CONSTRUCTION STANDARDS FOR SPECIALIZED ROOMS A. Vestibules

1. Install a vestibule in front of each entry and/or exit. Have contractor check local construction codes on vestibules at emergency exits, as they may be prohibited.
2. If present, shower rooms can count as a vestibule for an entrance (see restroom construction).
3. Build each vestibule at least 6 feet long from door threshold to door threshold.
4. Insure vestibule doors interlock so that only one door can be opened at a time.
5. Install thresholds and magnetic door frame gaskets to completely seal the doors with their frames and thresholds.

CONSTRUCTION STANDARDS FOR SPECIALIZED ROOMS B. A shower room is not necessary for containment of these types of organisms. However, if you determine this room is necessary, install **showers and restrooms** using the following guidelines to prevent organism escape.

1. If installed in the containment area, place showers/ restrooms in vestibule.
2. Equip restroom entry doors with all features required for other containment areas.
3. Cover air exhaust vents with screen or filters prescribed for other exhaust vents from the containment area.

IV. EQUIPMENT STANDARDS

EQUIPMENT STANDARD A. Use **benches, tables and other furniture** that are easy to inspect and clean.

1. Install work surfaces and laboratory furniture (bench tops, cabinets, tables, etc.) that are light gray or white, water resistant, impervious to mollusks, and resistant to caustic chemicals and heat.
2. Insure that spaces between benches, wall cabinets, and equipment are easy to clean and inspect.
3. Dedicate cleaning equipment (mops, brooms, buckets, etc.) <u>for use only</u> in the containment area, and store it in the containment area.

EQUIPMENT STANDARD B. Sterilize solid waste or **decontaminate** infested articles (contained organisms, soil, plant material, solid waste, and contaminated or infested articles) before removing it from the facility.

1. Install an autoclave, low temperature freezer appropriate for species being contained, or incinerator in the containment area. Conduct tests to evaluate effectiveness of equipment.
2. If you are considering an incinerator within the facility, consult your contractor about state, local, and federal laws and ordinances.
3. Treat soil before disposal by steam heat (15 lbs pressure at 250 ° F. for 30 minutes) or dry heat (250 ° F. for 2 hours or 310 ° F. for 30 minutes).
4. Stock the facility with appropriate sterilizing materials such as killing jars, 70% alcohol, and/or bleach.
5. If appropriate, a freezer may be used to kill organisms. However, other methods may be required to sterilize materials.
6. All materials except soil that are removed from containers (e.g. unconsumed food, dead snails, other debris) are immersed in bleach solution (maximum dilution 1 part 0.5% sodium hypochlorite to 5 parts water) for 5 minutes before disposal. These materials may also be incinerated or autoclaved.

EQUIPMENT STANDARD C. Use **cages and containers** to confine mollusks.

1. Construct cages from glass, acrylic, polycarbonate, etc., to contain mollusks within the containment areas.
2. Cover cage ventilation areas with metallic screen appropriate to contain organisms. Consider both the pore size of the screen and the material from which the screen is made in your selection.
3. There should be a space of at least 8 inches left between soil or substrate in the container and the lid.
4. Anchor cages to a solid structure to prevent tipping or pushing the cages.
5. Insure cages are easy to clean and disinfect.

V. OPERATIONAL STANDARDS

OPERATIONAL STANDARD A. A **Containment Director** is responsible for the daily operation and physical integrity of the facility.

1. A **Containment Director** is responsible for containment of the organisms in the facility.

He/she also maintains a copy of the Standard Operating Procedures (SOP) Manual for the facility.

2. SOPs contain directions for normal use, maintenance, testing, disinfestation, and disinfection of the facility and its equipment, as well as how to respond to emergency events (power outage, fire, glass breaks in containment area, flood, etc.) and monitor visitors.
3. Make copies of the SOPs available to workers within the containment areas. Date each revision.

The **Containment Director**:

1. Implements the SOPs and conditions listed in permits for organisms held by the facility.
2. Trains employees and/or authorized personnel in the SOPs.
3. Updates copies of construction records (blueprints) for the facility.
4. Maintains daily, weekly and monthly maintenance records of the facility.
5. Must notify PPQ of any structural or containment changes prior to implementation.
6. Notifies PPQ **immediately** in the event or a breach of containment.
7. Must obtain permission from PPQ prior to moving regulated organisms outside of the facility.
8. Must meet all PPQ requirements or conditions as listed in permits for snails kept in the facility. Permits from other Federal and State Agencies may also be required for certain plant pests. Receipt of USDA Plant Pest Permits does not relieve applicants from the responsibility of obtaining other permits. USDA permits may be withheld or revoked if other Federal and State requirement are not satisfied.
9. Must notify PPQ if the facility stops operating as a containment facility, either temporarily or permanently.

The **Containment Director** updates these lists:

1. The names and phone numbers of people to call during emergencies, as changes occur.
2. Authorized personnel, as changes occur.

SOPs also describe procedures related to all operating standards listed below:

OPERATIONAL STANDARD B. Only **Authorized Personnel** have routine access to the facility.

The behaviors of people who have access to your facility will have far more impact on the containment of the organism than any containment feature. Your selection of individuals to work in this facility is critical to maintenance of plant pest containment. In addition to picking good personnel, please consider the suggestions below:

1. Lock exterior doors at all times.

2. Train authorized personnel in the SOPs.
3. List the personnel authorized to enter the facility.
4. Require visitors to sign a logbook.
5. Insure emergency exit doors are not used routinely as an entrance (remove exterior handle, etc.). Emergency exits should be alarmed.

OPERATIONAL STANDARD C. Wear, sterilize, and handle personal **apparel** to minimize the risk of organism escape.

1. Insure visitors and employees wear laboratory coat in the containment area and remove it prior to leaving the containment area.
2. Prohibit entry of overcoats, hats, purses, etc. into the containment areas, as these articles may allow organisms to hide and escape.

OPERATIONAL STANDARD D. Clean and **disinfect** the interior of the facility and its equipment regularly.

1. Clean and disinfect the facility, its furniture, and its equipment regularly with bleach or similar disinfectant.
2. Air filters within the containment area should be changed on a regular basis.
3. Autoclave or sterilize solid wastes (air filters, cultures, plant materials, soil, trash, etc.) prior to disposal.

OPERATIONAL STANDARD E. Open and **handle packages** of permitted organisms to prevent organism release.

1. Establish one area to open packages received from foreign sources.
2. Autoclave or incinerate packing materials immediately after the removal of specimens and cultures.

OPERATIONAL STANDARD F. Start, grow, and **store cultures** with as few exotic contaminants as possible. Cross contamination indicates poor laboratory practice. However, it may not indicate containment problems.

1. List all nonindigenous plant materials used to rear herbivores, update as changes occur.
2. Confine all mollusks in cages that prevent escape.
3. Sterilize/destroy all packing materials from shipments and contaminants shortly after receipt.
4. Autoclave, incinerate or decontaminate materials used for rearing permitted organisms (old feeding media, soil, leaf litter, plant twigs, etc.) before removing from the facility.
5. Destroy contaminated organisms as soon as detected. This may mean destroying

beneficial cultures, if pathogens are found in the culture.

OPERATIONAL STANDARD G. Follow all PPQ regulatory requirements for organisms received, reared in, or released from the facility.

1. Meet all PPQ requirements or conditions as listed in permits for organisms kept in the facility. Permits from other Federal and State Agencies may also be required for certain plant pests. Receipt of a USDA Plant Pest Permit does not relieve applicants from the responsibility of obtaining other permits. USDA Permits may be withheld or revoked if other Federal and State requirement are not satisfied.
2. Obtain permission from PPQ prior to shipping regulated organisms outside of the facility. Live regulated organisms may only be moved out of containment to a recipient holding a USDA APHIS permit for that species.
3. Live permitted material may not be removed from containment any reason other than shipping to another APHIS inspected and permitted containment facility. You are required to obtain a copy of their permit prior to shipping. If you plan to process live snails outside of your containment facility, you must hold a second permit for the processing area and it must be an APHIS inspected containment facility.
4. Maintain a list of all organisms described in PPQ permits that enter and leave the facility. Submit the above list to USDA, APHIS, PPQ by January 31 of each year.
5. If the facility stops operating as a containment facility, either temporarily or permanently, and if there are any structural or containment changes (prior to implementation) notify USDA, APHIS, PPQ.
6. A current PPQ permit must be maintained as long as regulated material is kept in your possession; permits generally must be renewed every 3 years.