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*Great Lakes Forestry Centre
Insect Production Services*

STANDARD OPERATING PROCEDURE

Number: IPS/009/003

IPU Personnel Responsibilities



Effective Date: 19 January 2015

Canada



TITLE: IPU Personnel Responsibilities

APPROVING OFFICIAL:

Manager, Insect Production Services: _____

DD / MM / YY

___/___/___

SIGNIFICANT CHANGES FROM PREVIOUS VERSION:

- this SOP has been revised to reflect procedures required in the newly constructed insectary and quarantine facilities.
- the SOPs for *Sanitation of IPU Facility* and *Sanitation of MD Lab* have been discontinued and applicable duties incorporated into this SOP.
- procedures for tracking the receipt and shipment of orders for insects and diets have been revised.
- monthly and bi-weekly checklists have been revised.

1.0 INTRODUCTION

1.1 Purpose

This SOP has been established to assure that responsibilities of IPU personnel are clearly defined and are conducted timely, consistently and in support of maintaining the established IPS quality management system.

1.2 Scope

This SOP shall be followed by all IPU personnel in the performance of their duties.

1.3 Definitions

Biological Safety Cabinet (BSC)- A class 2 containment cabinet designed for both worker and sample protection; room air is drawn into the front of the unit; the unit is designed in such a way that room air is HEPA filtered before blowing over the work area; air-borne hazardous particles coming off samples in the work area are pulled away from the worker and the air is vented back into the room after HEPA filtration; this type of unit is not suitable for worker protection from chemical fumes.

Bio-Safety Officer (BSO) – A member of IPS who has supervisory authority over the daily operation of the IQ facility and who provides technical/research support to users of the facility.

Controlled Copy – A copy of an SOP distributed to select GLFC personnel having a unique copy number and dated signature of the IPS manager. Controlled copies are intended to ensure that GLFC personnel follow the most recent version of the SOP.



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Effective Date – The date from which the procedures given in an SOP are to be implemented.

Insectary – A multi-species rearing facility under the control of IPS used exclusively by the IPU for maintaining insect colonies and preparing artificial diets.

Insect Production Services (IPS) – A GLFC work team consisting of the Insect Production Unit (IPU), the Quality Control Unit (QCU) and Insect Quarantine (IQ) personnel who perform insect rearing, quality control and quarantine activities in support of forest pest research activities internal and external to the CFS.

Insect Production Services (IPS) Manager – The individual who has overall responsibility for activities of the IPS team.

Insect Production Supervisor – A member of IPS having supervisory authority over the daily operation of the insectary.

Insect Production Unit (IPU) – A work unit of IPS consisting of personnel who perform insect rearing, diet making and methods development activities at GLFC.

Insect Quarantine (IQ) – A general-use facility under the control of IPS used for rearing exotic forest insects and conducting associated research activities.

Insectary – A multi-species rearing facility under the control of IPS used exclusively by the IPU for maintaining insect colonies and preparing artificial diets.

Methods Development (MD) Lab – A research facility under the control of IPS used exclusively by the IPU for developing new rearing methods and for establishing new insect colonies.

NIST Traceable Thermometer/Hygrometer – A thermometer/hygrometer with a manufacturer's certificate of accuracy verifying that it was calibrated and tested against standards traceable to the National Institute of Standards and Technology (NIST).

Quality Control (QC) Lab – An analytical laboratory under the control of IPS used by the QCU for monitoring production, process and product control for all IPU insect colonies, and for developing new QC methods and procedures.

Quality Control Unit (QCU) – A work unit of IPS consisting of personnel who conduct routine production, process and product control testing and develop new QC methodology in support of IPU activities.



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Standard Operating Procedures (SOPs) – Directives describing routine administrative or technical procedures conducted by IPS personnel or users of the IQ facility.

1.4 Safety

- 1.4.1 Personnel shall have access to, and be familiar with, the MSDS for all chemicals and diet ingredients used in the rearing facility.
- 1.4.2 Personnel must exercise health precautions to minimize risk to themselves and to their co-workers. They should communicate to the IPU supervisor any relevant known health or medical condition in order that they can be excluded from operations that may aggravate their condition.
- 1.4.3 Personnel shall comply with all safety instructions identified in the SOP applicable to a task that is being performed.

1.5 Materials

- 1.5.1 IPS Form Number 0020/008 (*Bi-Weekly Checklist*, Appendix 3).
- 1.5.2 IPS Form Number 0019/006 (*Monthly Checklist*, Appendix 4).
- 1.5.3 Equipment logbooks for each piece of equipment used in the insectary.
- 1.5.4 Binders and files specified in section 2.32.1.
- 1.5.5 Binder of MSDS for all chemicals used in the insectary.
- 1.5.6 Cleaning solutions:
 - a) 6% Javex[®] cleaning solution
 - b) Windex[®]
- 1.5.7 Personal protective safety equipment:
 - a) lab coats
 - b) disposable chemical protective polymer gloves
 - c) dust mask
 - d) additional personal protective safety equipment (i.e., safety goggles, respirator suitable for protection against mold and fungus, etc.) may be required to perform duties described in associated SOPs.
- 1.5.8 Sterile paper toweling.
- 1.5.9 Floor cleaning equipment dedicated for use in the insectary.

2.0 PROCEDURES

2.1 Personal Responsibilities

- 2.1.1 Personnel shall ensure that they comply with all safety requirements specified in section 1.4.
- 2.1.2 Personnel shall take responsibility for the quality of their work and for the completion of forms, tracking records, check-off sheets, etc. by initialing *IPS Reporting Forms* as specified in the SOP applicable to the task performed.



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- 2.1.3 Personnel must work together as a team to ensure that all elements described in this SOP are completed, even if/when individual work assignments have not been delegated by the IPU supervisor.
- 2.1.4 Personnel shall ensure that they receive training on the use of any SOP for which they are required to perform.
- 2.1.5 Each employee shall meet the IPU supervisor at least twice a year to plan his/her training and development program. This planning is best accomplished during the employee's performance review process.
- 2.1.6 Personnel shall comply with all instructions identified in a SOP for a task that is being performed. When this is not possible, or will impact negatively, the IPU supervisor must be consulted immediately. SOPs or Reporting Forms shall not be revised without first consulting the IPU supervisor and/or the IPS manager, as specified in section 5.1 (i.e., Responsible Individual) of the applicable SOP.
- 2.1.7 Personnel shall make all IPU records available to the QCU upon request.

2.2 Facility Room Allocation

(refer to Appendix 1, *Insectary Floor Plan*, to view the facility layout and refer to Appendix 2, *Insectary Room Purpose*, for a detailed description of the intended purpose of each room in the insectary)

- 2.2.1 Door AA225A is to be used for routine entry and exit of IPU and maintenance personnel and supplies. Door AA238A is to be used only by IPU and maintenance personnel (when authorized by the BSO) to access the quarantine facility. All other perimeter doors are for emergency egress only. Door AA115B may be used for periodic entry of equipment or materials when authorized by the IPU supervisor or IPS manager.
- 2.2.2 Room AA209 is a change room where IPU personnel remove jackets/coats and store them in the provided lockers. Facilities personnel and visitors don lab coats and shoe covers. A sticky floor mat is intended to reduce debris being tracked into the insectary.
- 2.2.3 All areas between the main entrance door (i.e., door AA225A) and the door to the administration area (i.e., room AA220) are designated as a "dirty room" and are to be used for:
 - a) lockers and change area
 - b) packaging of insect and diet orders for external clients
 - c) receipt of materials and supplies
 - d) washing or autoclaving materials entering the facility (including surface sterilization of foliage)
 - e) washing or autoclaving lab ware
 - f) training/break-room
 - g) methods development modules
 - h) washrooms



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- (All other areas of the insectary are designated as a “clean room”).
- 2.2.4 Methods Development Modules (Modules AA212 and AA213) are used for initiating new insect colonies from field-collected insects or from other insectaries, and for developing associated rearing methods. These modules are considered “dirty rooms” because of potential pathogens harbored within the insects and plant materials. Colonies are segregated by module to reduce the incidence of spread of disease between colonies. IPU personnel must schedule their work in these modules at the end of the day since they are not permitted back into “clean room” areas on the same work day.
- 2.2.5 The admin/records area (Room AA220) contains work stations for record keeping duties of insectary workers. A sticky floor mat, located at the entrance to this area, is intended to reduce debris tracked further into the insectary.
- 2.2.6 Modules AA217 through AA219 and AA222 through AA225 are used for the rearing of various domestic insect colonies. Modules AA222 through AA225 have the potential to be converted from insectary use (two modules at a time) to become part of the quarantine facility. Colonies are segregated by module to reduce the incidence of spread of disease between colonies. Rearing containers shall not be opened anywhere in these rooms (they shall be taken to a BSC for examination).
- 2.2.7 General Work Room AA221 is a laboratory space supporting various insectary activities such as surface sterilization of eggs, preparation of substrates for mating cages, etc.
- 2.2.8 Rooms AA118A&B (Diet Preparation Room and Diet Kitchen) are used for the preparation of raw diet ingredients (e.g., weighing, toasting, vacuum sealing, etc.) and for the manufacture of artificial diets. Two cold rooms are located in this work space. One is used for the storage of raw diet ingredients (Room AA118C) and the other (double-entrance unit) is used for prepared diets (Room AA115). The entrance door on the side of the diet kitchen is used for the entry of diets and the door on the hallway side is used for retrieval, thus reducing the need for entry to the diet kitchen by insectary personnel other than for diet-making activities. The diet kitchen is intended to be the cleanest room in the insectary.

2.3 Insectary Access Authorization

- 2.3.1 IPS personnel and GLFC maintenance personnel approved by the IPU supervisor or the IPS manager will be permitted to have swipe card access through door AA225A.
- 2.3.2 Only high ranking visitors (e.g., ministers, deputy ministers, directors, etc.) will be permitted access to the insectary by prearrangement with the IPU supervisor or the IPS manager. IPS personnel shall instruct



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visitors on entry/exit procedures and shall escort them during the entire time they are present in the facility.

- 2.3.3 Maintenance personnel/contractors external to the GLFC facilities team will be permitted access to the insectary by prearrangement with the IPU supervisor or IPS manager. IPS personnel or GLFC facilities personnel shall instruct these visitors on entry/exit procedures and shall escort them during the entire time they are present in the facility.
- 2.3.4 GLFC cleaning staff or commissionaires are not permitted to enter the insectary at any time.

2.4 Procedure to Enter Insectary

- 2.4.1 Door AA225A is to be used for routine entry/exit of the insectary by IPS or authorized GLFC facilities personnel. Door AA238A is to be used only by trained persons authorized by the Bio-Safety Officer or IPS manager. All other perimeter doors are for emergency egress only. Door AA115B may be used for periodic entry of equipment or materials when authorized by the IPU supervisor or IPS manager (door alarm must temporarily be overridden).
- 2.4.2 Personnel shall minimize access to other parts of the building and shall never enter other research labs prior to entering the insectary.
- 2.4.3 IPS personnel shall remove their footwear and leave them on the shoe mats provided in Corridor Q1 prior to using their swipe card and entering locker room AA209. Personal belongings, including jackets/coats, shall be left in the storage lockers provided.
- 2.4.4 Facilities personnel, external contractors and visitors may wear their footwear into locker room AA209 but must install the provided shoe covers before proceeding further into the facility.
- 2.4.5 All persons entering the facility must ensure that both feet make contact with the anti-microbial sticky mat upon entering the insectary.
- 2.4.6 Hands shall be disinfected with anti-microbial cleaner upon entering the insectary.
- 2.4.7 IPS will install the provided dedicated laboratory footwear upon entry into the insectary.
- 2.4.8 IPU personnel shall don lab coats and wireless phones which are both located on wall racks near the entry door.
- 2.4.9 Maintenance personnel shall be monitored by IPU personnel to ensure that entrance procedures are followed and that they limit the tools entering the facility to only those required to perform the task at hand.
- 2.4.10 IPU personnel intending to enter Methods Development Modules shall remove their IPU lab coat and footwear and don a lab coat and footwear dedicated to the MD lab. These persons shall not return to "clean room" areas of the insectary on the same work day.
- 2.4.11 IPU personnel intending to enter the quarantine facility shall remove their IPU lab coat, footwear and wireless phone prior to entering ante



room AA211C and donning dedicated quarantine garments and phone. These persons shall not return to “clean room” areas of the insectary on the same work day.

2.5 Procedure to Exit Insectary

- 2.5.1 Lab coats, lab shoes and wireless phones shall be removed every time personnel leave the insectary. Shoe covers shall be removed within the locker room.
- 2.5.2 The anti-microbial mat shall be avoided upon exit to maintain its longevity.

2.6 Control of Materials and Supplies Entering Insectary

- 2.6.1 All materials and supplies entering the facility shall be autoclaved if possible. If not, materials shall be sprayed with a 6% Javex[®] cleaning solution where feasible, followed by wiping with sterile paper towel after at least 10 minutes of contact time.
- 2.6.2 Materials and supplies shall be removed (where feasible) from their original packaging boxes (outside of access Door AA225A) before entering the insectary.
- 2.6.3 Representative samples of insects brought into Methods Development Modules shall be provided to QCU personnel as soon as possible for screening for pathogens and parasites.
- 2.6.4 Paperwork entering the facility from other administration areas in the building shall be minimized. Paperwork from research laboratories is prohibited from entry. Insect and/or diet requisitions shall only be accepted in electronic format.
- 2.6.5 Diet, insects, trays or rearing supplies must not be accepted for return to the insectary. Diet and insects shall be distributed on paper trays and metal trays reserved for use within the insectary.

2.7 Storage of Materials and Supplies

- 2.7.1 Materials and supplies shall be stored in a manner that will maintain their cleanliness.
- 2.7.2 Bulk quantities of materials and supplies (e.g., creamer cups, lids, etc.) shall be stored outside of the insectary but in controlled access areas (e.g., basement) where they are maintained at room temperature (ambient RH) and are protected from deterioration or contamination. Access to storage rooms shall be restricted to IPS and GLFC facilities personnel.
- 2.7.3 Smaller quantities of materials and supplies shall be stored in the insectary in enclosed cupboards/shelves/drawers or storage room



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- AA117. Lab ware shall be maintained in the foil wrapping or steam sterilization pouches that were used for autoclaving.
- 2.7.4 Prepared diet shall be maintained in cold room AA115 and shall be retrieved as needed using the access door in Corridor T.
 - 2.7.5 Diet ingredients requiring cold storage shall be maintained in cold room AA118C or the freezer in corridor U. Ingredients requiring ambient storage conditions shall be maintained in closed cupboards/shelves/drawers. Refer to the SOP for *Preparation of Artificial Diets* for specific storage requirements, methods and documentation.
 - 2.7.6 Surface-sterilized foliage shall be maintained in sealed containers in the MD Lab or refrigerator in room AA211A.
 - 2.7.7 Diet ingredients or prepared diet must not be stored for a duration longer than that identified in the SOP for *Preparation of Artificial Diets*.
 - 2.7.8 Janitorial equipment and supplies shall be maintained in Rooms AA216 or AA119 and shall be dedicated for use within the insectary.

2.8 Waste Disposal

- 2.8.1 Garbage pails shall be lined with bags, emptied daily and removed from the facility.
- 2.8.2 When working in a BSC or a chemical fume hood, a garbage bag shall be maintained within the unit. When there is insufficient space, a garbage pail may be used if it is maintained in the immediate vicinity of the opening of the unit and the fan is running.

2.9 Control of Air-borne Particulates

- 2.9.1 Floors within the insectary shall never be swept or dry mopped, thus causing particulates to become air-borne. Floors shall be swiffered[®] or vacuumed using the facility HEPA filtered central vacuum system whenever they are visibly soiled.
- 2.9.2 To ensure that airflow patterns within the insectary are not disrupted, doors are not to be propped open (Exception: Doors AA234 and AA248 may be propped open to facilitate movement of personnel and equipment).
- 2.9.3 Rearing containers or mating chambers shall only be opened within a BSC.
- 2.9.4 Air pressure monitors (with visible and audible alarms) are installed at the entry to every room in the insectary to indicate outward directional air flow, i.e., each room is positively pressurized to prevent the ingress of air from outside of the insectary (exception: MD Labs are negatively pressurized and monitors confirm inward directional air flow, thus ensuring that potential air borne pathogens in those areas are immediately exhausted to the outside). Work areas shall not be used



for insect handling or diet making activities if/when air pressure monitors are in alarm (Note: GLFC facilities personnel are contacted by an automated alarm notification system whenever air pressurization fails).

2.10 Maintenance of BSCs and Chemical Fume Hoods

- 2.10.1 The working area of each BSC and chemical fume hood shall be sprayed at the start of each work day with a 6% Javex[®] cleaning solution, allowing at least 10 minutes of contact time before wiping (if required) with sterile paper towel. The fan for the unit shall be turned on to indicate to other personnel that the unit has been cleaned. Surfaces can be sprayed with Windex[®] and wiped with sterile paper towel to remove residue left by the cleaning solution.
- 2.10.2 The working area of BSCs and chemical fume hoods shall be cleaned after each use by vacuuming and spraying with a 6% Javex[®] cleaning solution, as above.
- 2.10.3 The complete interior of each BSC shall be cleaned bi-weekly by lifting the benchtop access panel, vacuuming with the facility HEPA-filtered vacuum and spraying with a 6% Javex[®] cleaning solution, as above. Cleaning shall be documented on the *Bi-Weekly Check List* (refer to Appendix 4).
- 2.10.4 The power level warning light on each BSC and chemical fume hood shall be monitored at each use to ensure that flow rates are within acceptable limits. When a unit is in alarm, it shall be labeled to indicate that it is out of order, serviced by a qualified repair technician, and repair actions recorded in the equipment logbook.
- 2.10.5 Exterior surfaces of BSCs and chemical fume hoods shall be cleaned with a 6% Javex[®] cleaning solution at least annually.
- 2.10.6 BSCs and chemical fume hoods shall be inspected, serviced and recertified annually by an external qualified contactor and documented in the equipment logbook.
- 2.10.7 BSCs shall be recertified whenever they are relocated.

2.11 Maintenance of Environmental Chambers and Rearing Rooms

- 2.11.1 Environmental chambers and rearing rooms shall be cleaned, programmed and monitored as specified in the current version of SOP Number IPS/001, *Environmental Chambers and Rearing Rooms*.

2.12 Autoclaving Procedures

- 2.12.1 Autoclaving performed using either of the two IPU autoclaves may be performed by any member of IPS. All autoclaving performed using the IQ autoclave shall be conducted and documented by the BSO.



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- 2.12.2 All lab ware/glassware/instruments shall be washed, covered/wrapped using foil or steam sterilization pouches/sheets and autoclaved (15 min at 121°C) after each use; these shall be kept covered/wrapped until the next use. Brushes shall be sterilized by immersion for at least 10 min in a 6% Javex[®] cleaning solution.
- 2.12.3 All paper toweling and cheesecloth to be brought into the insectary shall be wrapped in foil and autoclaved for 15 min at 121°C.
- 2.12.4 Water (i.e., RO water) used for insect rearing procedures (i.e., egg sterilization, misting of mating chambers, etc.) shall first be autoclaved for 45 min when 1L containers are used and 90 min for 4L volumes. Containers shall be labeled with the date of preparation and shall be replaced at least bi-weekly.
- 2.12.5 Steam indicator strips/tape shall be used whenever using the autoclave to indicate that steam sterilization was successful.

2.13 Daily Work Schedule

- 2.13.1 At the start of each work day, personnel shall ensure that:
 - a) established entry procedures are practiced as specified in section 2.4.
 - b) sign-in forms (refer to the current version of IPS Form Number 0141, *Insect Production Services Sign-in Form*) for GLFC facilities personnel are reviewed for equipment malfunction and appropriate actions are taken/documentated to ensure the integrity of affected insect colonies or stored diets/ingredients.
 - c) the Delta System is checked for each environmental chamber, cold room and rearing room following procedures, documentation requirements and corrective actions specified in the current version of SOP Number IPS/001 (*Environmental Chambers and Rearing Rooms*).
 - d) fresh Javex[®] solution is prepared and all BSCs and chemical fume hoods are sprayed/wiped with a 6% Javex[®] cleaning solution, allowing at least 10 minutes of contact time before windexing[®]/wiping with sterilized paper towel to remove residue; the lights to the units shall be turned on to inform other workers that sanitation has been performed.
 - e) new garbage bags are inserted into pails that are likely to be used during the day.
 - f) the workload for the day is assessed after examining the development of each insect colony; a visual inspection shall be made of each insect colony even when no activity is scheduled for that colony (e.g., does the diet look dried out?).
 - g) the workload of absent personnel is distributed evenly among those present.



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- h) if an alarm has been triggered for a reach-in chamber, walk-in chamber, or cold room, transfer the contents of the chamber to the alternate environment posted on the unit, contact the maintenance department for repair, document the occurrence on applicable insect tracking sheets or diet ingredient storage logs, and document the maintenance/repair action in the equipment log.
 - i) each reach-in chamber, walk-in chamber or cold room is opened and a crude assessment of the temperature/RH/light is made and compared to the NIST traceable thermometer/hygrometer as well as to the required settings posted on the door of the unit.
 - j) sticky floor mats are replaced as needed.
- 2.13.2 At the end of each work day, personnel shall ensure that:
- a) any insect colony tracking sheets that were completed during the day are checked for completeness, filed in the binder applicable to that species, and a copy submitted to the QCU.
 - b) any insect QC samples collected during the day are submitted to the QCU.
 - c) all BSCs and chemical fume hoods used during the day were sanitized as specified in 2.13.1d; the lights to the units shall be turned off to inform other workers that sanitation has been performed.
 - d) all garbage bags that were used are removed from the facility.
 - e) all insects and diets have been stored in their proper location.
 - f) in the case of proposed absence on the next day, other personnel have been informed of work that needs to be performed.
 - g) established exit procedures are practiced as specified in section 2.5.
- 2.13.3 Personnel who are unable to report to work for medical or other reasons shall notify the IPU supervisor (when possible) at the start of the day and shall provide instructions for the individual(s) who will provide back-up support for his/her areas of responsibility.

2.14 Bi-Weekly Work Schedule

- 2.14.1 Throughout the work week, IPU personnel shall conduct the tasks identified below and document (by dated initials) their completion on IPS Form Number 0020/008 (*Bi-Weekly Checklist*, Appendix 4). On the last work day of the second week, personnel shall review the list and complete any outstanding requirements. More frequent cleaning is required whenever items are visibly soiled.
- a) Print out and file Delta System environmental records and maintain with historical records.
 - b) The interior of each reach-in chamber shall be vacuumed and sprayed with a 6% Javex[®] cleaning solution, allowing at least 10



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- minutes of contact time before wiping (if required) with sterilized paper towel.
- c) The interior of each walk-in chamber and cold room shall be vacuumed and washed with a 6% Javex[®] cleaning solution.
 - d) Door handles on reach-in and walk-in chambers and cold rooms shall be cleaned using a 6% Javex[®] cleaning solution.
 - e) Alarm limits shall be checked for each environmental chamber as specified in the current version of SOP Number IPS/001 (*Environmental Chambers and Rearing Rooms*).
 - f) Lab coats shall be collected from the IPU, MD, diet kitchen and IQ facility (both floors) and laundered in the IPS laundry facility. Lab coats may not be removed from the IQ facility unless autoclaved and authorized by the BSO.
 - g) All floors (IPU, IQ 2nd floor, IPU elevator, MD and staircase to diet kitchen) shall be vacuumed and mopped with sufficient quantities of a 6% Javex[®] cleaning solution to provide at least 10 minutes of contact time before air drying.
 - h) All benchtops (IPU, 2nd floor IQ and MD) shall be sprayed/wiped with a 6% Javex[®] cleaning solution, allowing at least 10 minutes of contact time before windexing[®]/wiping with sterilized paper towel to remove residue.
 - i) Each sink (IPU, 2nd floor IQ and MD) shall be cleaned using scouring pads.
 - j) All door handles (rooms, corridors and entry/exit doors) shall be cleaned using a 6% Javex[®] cleaning solution.
 - k) All light switches (IPU, 2nd floor IQ and MD) shall be cleaned using a 6% Javex[®] cleaning solution.
 - l) Each BSC (IPU, 2nd floor IQ and MD) shall be vacuumed under the work-top panel and have the glass sash windexed[®].
 - m) Lab shoes (IPU, 2nd floor IQ and MD) shall be cleaned by spraying with a 6% Javex[®] cleaning solution, allowing at least 10 minutes of contact time before wiping (if required) with sterilized paper towel. The shoe storage racks shall be cleaned at the same time.
 - n) All telephones (landlines and wireless) in the IPU and IQ 2nd floor shall be wiped using a 6% Javex[®] cleaning solution.
 - o) All computers (keyboard and mouse) shall be wiped using a 6% Javex[®] cleaning solution and screens shall be wiped using the specialty cloth designed for doing so.
 - p) Microscopes shall be wiped using a 6% Javex[®] cleaning solution.
 - q) Mating cage misting bottles shall be washed with soap and water and refilled with autoclaved RO water (each week).
 - r) Insectary washrooms shall be cleaned using standard janitorial products; consumables/amenities shall be replenished as needed. More frequent cleaning shall be performed when washrooms are visibly soiled.



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- s) Balances shall be wiped using a 6% Javex[®] cleaning solution.
 - t) Door windows (IPU, MD, IQ 2nd floor, link, corridors) shall be windexed[®]; exterior windows shall be windexed[®] as needed.
 - u) Insect display-case windows (level 1 and 2) shall be windexed[®].
 - v) Steam generators for both autoclaves shall be flushed; drain screens for both autoclaves shall be emptied.
 - w) The UV light in room AA211C shall be checked to ensure that it is functioning; replace light bulb as needed.
 - x) The sticky trap in room AA211C shall be checked for insects and replaced as needed; the source of trapped insects shall be determined and corrective action taken; the BSO shall be notified whenever insects are found.
- 2.14.2 IPS Form Number 0020/008 (*Bi-Weekly Checklist*, Appendix 4) shall be maintained in the binder identified as “Bi-Weekly Checklists”).

2.15 Monthly Work Schedule

- 2.15.1 Throughout each month, personnel shall conduct the tasks identified below and document (by dated initials) their completion on IPS Form Number 0019/006 (*Monthly Checklist*, Appendix 4). On the last Thursday of the month, personnel shall review the list and complete any outstanding requirements.
- a) Each April and September, an inventory shall be taken of supplies in storage room AA117 and in the basement and the task documented on the *Monthly Checklist* (this item will not be checked off on the *Monthly Checklist* for other months). The supply inventory list on the Insect Production Network Drive shall be updated to reflect changes.
 - b) Compare Delta System readings with NIST traceable thermometer/hygrometer readings in each reach-in, walk-in and cold room (IPU, MD and IQ 2nd floor) as specified in the current version of SOP Number IPS/001 (*Environmental Chambers and Rearing Rooms*).
 - c) An inventory of diet ingredients shall be updated and supplies ordered as specified in the current version of SOP Number IPS/010 (*Preparation of Artificial Diets*).
 - d) Transfer the contents of the “outboxes” for completed insect and diet orders (internal and external clients) to the IPU supervisor.
 - e) Shelves in the walk-in cold rooms shall be wiped down with a 6% Javex[®] cleaning solution.
 - f) Shelves in all refrigerators shall be wiped down with a 6% Javex[®] cleaning solution.
 - g) Each Nilfisk[®] HEPA vacuum canister shall be inspected and cleaned as specified in 2.25.1.



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- h) Each fire extinguisher (IPU, 2nd floor IQ and MD) shall be checked to ensure that it is fully pressurized as indicated on the gauge. The tag on each extinguisher shall be initialed in the applicable box.
 - i) Ensure that the emergency shower located in Corridor S1 (2nd Floor IQ) is functioning correctly by pulling the emergency lever and collecting about half a pail of water. The tag on the shower shall be initialed in the applicable location.
 - j) Eyewash stations (diet kitchen, work room AA221, and 2nd floor IQ) shall be flushed by running them for one minute. The tag on each eyewash station shall be initialed in the applicable box.
 - k) The actual contents of first aid kits (rooms AA118A and AA221) shall be checked against the list of required contents and additional supplies requisitioned and added as needed.
 - l) Tea towels at each sink shall be exchanged and washed.
 - m) Ensure that panic bar alarms (doors AA115B, AA2, AA249B and AA249A) are functioning correctly by depressing the bar just enough to set off the alarm, but not enough to break the seal on the door. Turn off the alarm using a master key; replace batteries as needed.
 - n) Check each sink (2nd floor IQ) to ensure that it is fitted with two screens. Check the drain for each reach-in environmental chamber (2nd floor IQ) to ensure that it is fitted with a screen and that the drain lines are inserted correctly.
 - o) Vacuum screens on air supply/return ducts (2nd floor IQ).
 - p) Check the RO water system in the basement to ensure that there are no maintenance or filter alarms.
 - q) Check the battery on the emergency lighting located in the emergency service core (room AA211D) to ensure that it is functioning.
 - r) Archive IPS sign-in forms [located outside the front door of the facility (door AA225A)] with facility records.
- 2.15.2 The *Monthly Checklist* shall be submitted to the IPU supervisor for review/signature and shall be maintained in the binder identified as "Monthly Checklists".

2.16 Annual Work Schedule

- 2.16.1 The accuracy of the Delta System temperature and RH sensors shall be verified (and recalibrated if required) as specified in the current version of SOP Number IPS/001 (*Environmental Chambers and Rearing Rooms*).
- 2.16.2 The entire insectary and quarantine facility (i.e., floors, walls, ceilings, cabinets, drawers, cupboards, rearing chambers, light fixtures, etc.) shall be cleaned at least annually using a 6% Javex[®] cleaning solution.



- 2.16.3 Personnel shall meet with the IPU supervisor annually to discuss the employee's training and development plan as specified in section 2.1.5.

2.17 Reports from QCU

- 2.17.1 Upon notification of results of air sampling conducted by the QCU, the IPU supervisor (in consultation with the IPS manager) shall determine the need for corrective action (e.g., facility clean up, revision of procedures, etc.). A binder of printed reports shall be maintained by the IPU.
- 2.17.2 Upon notification of results of insect QC screening by the QCU, the individual with direct responsibility for the colony to which the report relates shall take the action specified. A binder of printed reports shall be maintained by that individual.
- 2.17.3 Upon notification of results of QC screening for diet ingredients or prepared diet by the QCU, IPU personnel shall take the action specified in the report. A binder of printed reports shall be maintained by IPU personnel.

2.18 Contingency for Fire or Chemical Spill Alarm

- 2.18.1 Personnel shall vacate the facility immediately upon hearing the fire or chemical spill alarm and shall follow routine exit procedures. When danger is imminent (e.g., visible smoke or chemical odor), routine exit procedures shall be omitted (i.e., use any door for exit, do not change footwear, etc.).
- 2.18.2 When a member of the IPU is also a GLFC Emergency Floor Monitor, that individual shall do a sweep of the facility prior to vacating it.

2.19 Power Outage

- 2.19.1 Upon determination that a power failure has occurred, personnel shall immediately determine the status of any insect colonies or diet materials that may have been affected. Documentation of the outage and possible effects shall be recorded on applicable insect tracking sheets, diet ingredient tracking sheets, or diet checklists.
- 2.19.2 Upon restoration of power, personnel shall ensure that each reach-in chamber, walk-in chamber and cold room is functioning as intended; chambers shall be reprogrammed if necessary; reprogramming shall be documented in the applicable equipment logbooks.
- 2.19.3 Upon restoration of power, personnel shall ensure that all other critical systems in the insectary are functioning (i.e., air pressurization, fume hoods, etc.).



2.20 Electronic Records

- 2.20.1 Electronic records maintained by the IPU shall be stored on the Insect Production Network Drive, which is routinely backed-up by the GLFC IT department.
- 2.20.2 Hard drives on computers in the insectary shall only be used for temporary storage of files not essential to daily operations of IPS or for maintenance of historical records.

2.21 Equipment Logbooks

- 2.21.1 A specific logbook (3-ring binder) shall be created for each piece of equipment used in the IPU. A single logbook may be used when there are multiple numbers of the same type of unit (e.g., reach-in environmental chambers), as long as the contents of the binder are clearly linked to each unit.
- 2.21.2 Equipment logbooks shall be maintained in General Work Room AA221.
- 2.21.3 Each logbook shall be labeled on the front cover and/or spine to identify, by simple name or number, the specific device to which it pertains.
- 2.21.4 The first page of each logbook shall be a title page which identifies the specific name or number of the device to which it pertains and provides additional information including the type of device, manufacturer and serial number.
- 2.21.5 The remainder of the logbook shall be divided into sections applicable to the device, for example:
 - a) Cleaning Log
 - b) Calibration Log
 - c) Maintenance and Repair Log
 - d) References (this section shall include any additional information such as certificates of calibration, operator manuals, etc.)

2.22 Insect Cultures

The IPU supervisor shall assign responsibility for insect cultures to specific individuals; however, each member of the IPU shall work together as a team to ensure that all required tasks are completed as specified in the SOP applicable to each culture.

2.23 Sterilization of Foliage and Branches

- 2.23.1 Artificial substrates must be used wherever possible to replace natural foliage and/or branches.



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- 2.23.2 Foliage, branches or other natural substrates must not enter biological work areas of the insectary until they have been sanitized.
- 2.23.3 Procedures for the sterilization of foliage, branches and other natural substrates are identified in SOPs specific for each insect species.

2.24 Lab Coats

- 2.24.1 Specifically labeled lab coats shall be worn for each activity:
 - a) diet making (red embroidery)
 - b) insect handling (green embroidery)
 - c) methods development (blue embroidery)
 - d) insect quarantine (orange embroidery)
- 2.24.2 Lab coats shall be changed whenever they become visibly soiled or at least bi-weekly.
- 2.24.3 Soiled lab coats shall be stored in the laundry bag in room AA209, laundered bi-weekly and documented on the *Bi-Weekly Checklist*. Clean lab coats shall be stored in a locker in room AA209 until required.
- 2.24.4 Lab coats shall not be worn outside of the area for which they are intended. IQ lab coats shall not be removed from quarantine without autoclaving/authorization by the BSO.

2.25 Maintenance of Nilfisk® HEPA Vacuum System

- 2.25.1 The HEPA filtered central vacuum system for the insectary (i.e., clean-out canisters located in rooms (AA113, AA202 and AA211D) shall be inspected monthly and cleaned as follows:
 - a) Apply personal protective safety equipment including a lab coat, dust mask and disposable chemical protective polymer gloves.
 - b) Turn off the power switch on the side of the unit.
 - c) Unclip and remove the cover from the canister; scrape/shake debris off the filter (try to avoid airborne dissemination of dust); replace the filter when necessary.
 - d) Unclip the canister and dump the contents into a garbage bag.
 - c) Wipe interior and exterior surfaces using a 6% Javex® cleaning solution.
 - e) Reassemble the canister once dry.
 - f) Turn on the power switch on the side of the unit.
- 2.25.2 Inspections shall be documented on the *Monthly Check List*.
- 2.25.3 Any maintenance or repair actions to the HEPA vacuum system shall be documented in the equipment logbook for the applicable Nilfisk® unit.

2.26 Preparation of Artificial Diets

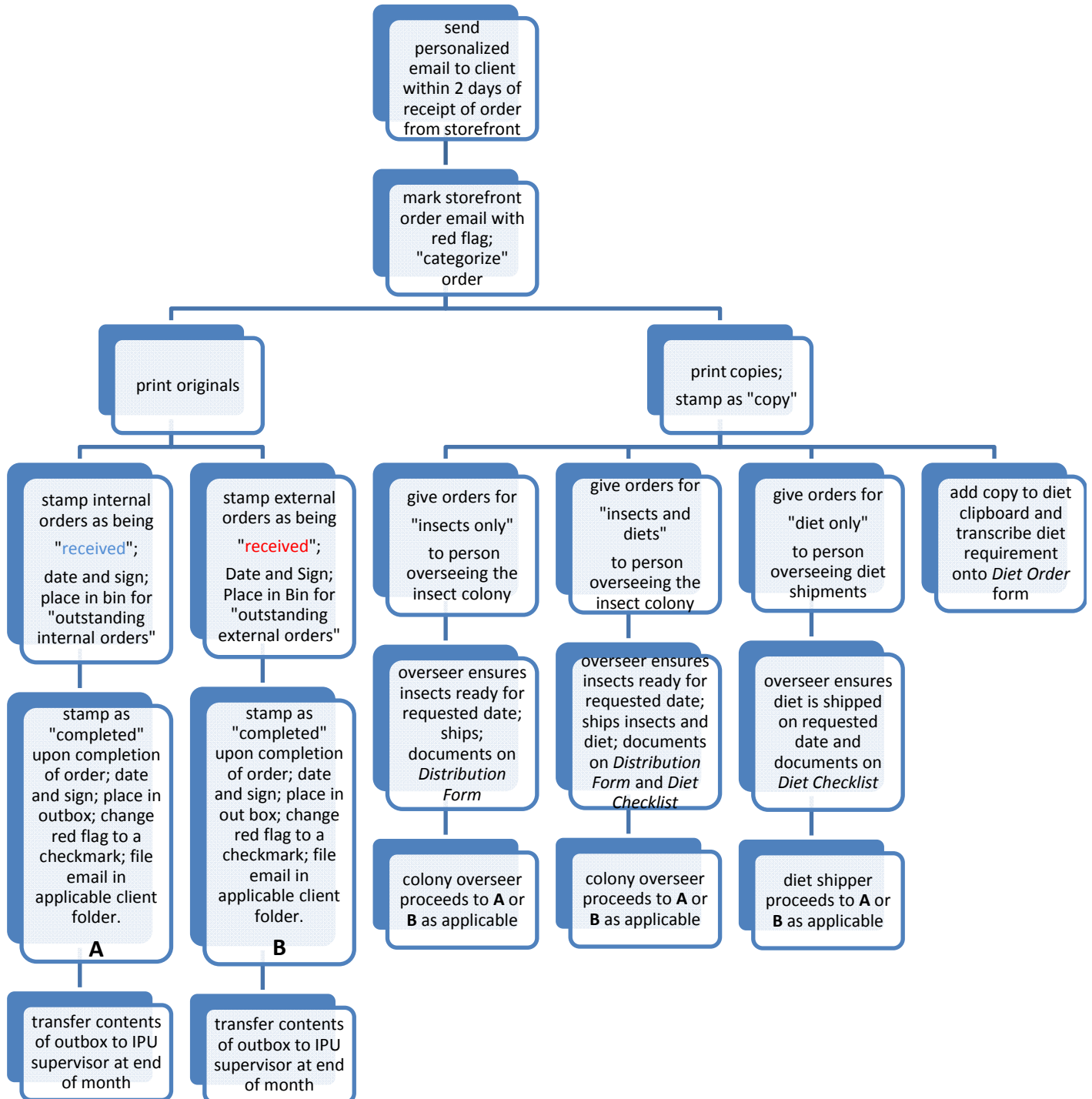
The IPU supervisor shall assign a group leader for each diet making session as having overall responsibility; however each member of the IPU shall work



together as a team to ensure that all elements of the current version of SOP Number IPS/010 (*Preparation of Artificial Diets*) are conducted as specified.

2.27 Processing of Orders for Insects and Prepared Artificial Diets

(refer to the flow chart below for sections 2.27.3 through 2.27.6)





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- 2.27.1 Orders for insects or artificial diets shall only be accepted from internal and external clients through the IPS web-based storefront (i.e., requests submitted through standard email or telephone are not to be accepted).
- 2.27.2 The IPU email account shall be reviewed daily (excluding weekends and holidays) for the receipt of orders from the storefront.
- 2.27.3 Within two days of receipt of an order:
- Send a personalized email to the client to confirm availability of requested materials and the anticipated shipping date (Note: the storefront sends an automated message as soon as an on-line order is placed, indicating the items and shipment dates requested by the client).
 - Mark the automated email message with a *red flag* to indicate that a response was made but the order is still outstanding; right-click on the email message, select “categorize”, then choose the applicable category (i.e., Diet Order, or the applicable insect species) requested by the client (repeat as necessary when orders include multiple insect species and/or diet types). The IPU mail box should appear similar to the image below once orders have been acknowledged and categorized:

Date	Size	Category	Status
Tue 2014-11-25 12:10	3 KB	Tni Order	Red Flag
Mon 2014-11-24 15:48	2 KB	Diet Order	Red Flag
Mon 2014-11-24 15:24	2 KB	DCf Order	Red Flag
Mon 2014-11-24 15:08	2 KB	Diet Order	Red Flag
Mon 2014-11-24 10:41	2 KB	OI Order	Red Flag
Fri 2014-11-21 16:15	4 KB	DCf Order	Red Flag
Wed 2014-11-12 11:11	3 KB	Tni Order	Checkmark
Mon 2014-10-27 13:14	4 KB	DCf Order	Red Flag
Tue 2014-10-21 06:24	4 KB	Diet Order	Red Flag
Mon 2014-10-13 10:04	3 KB	DCf Order	Red Flag
Wed 2014-10-08 09:49	6 KB	DCf Order	Red Flag
Mon 2014-10-06 16:25	4 KB	DCf Order	Red Flag

- Print multiple copies of the order and distribute as follows:
 - One copy shall be retained as the *original*; internal (i.e., GLFC) orders shall be stamped as “**Received**” (i.e., using blue ink) and



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- with the date of acceptance of the order; external orders shall be stamped as “Received” (i.e., using red ink) and with the date of acceptance of the order; the individual accepting the order shall provide their signature in the space provided on the stamp. *Originals* shall be placed in the bin designated as either “Outstanding Internal Orders” or “Outstanding External Orders”, as applicable.
- ii. Additional copies shall be made for each insect species and for each diet type listed on the order and shall be stamped “COPY” as follows:
- Copies of “insects only” orders shall be given to the individuals overseeing the applicable colonies; these persons shall ensure that the insects are ready for the requested date, the insects are packaged and shipped, and distribution is documented on the applicable *distribution form*.
 - Copies of “insects and diet” orders shall be given to the individuals overseeing the applicable colonies; these persons shall ensure that the insects are ready for the requested date, the insects and diet are packaged and shipped, and distribution is documented on the applicable *distribution form* and *diet checklist*.
 - Copies of “diet only” orders shall be given to the person overseeing diet shipments; this person shall ensure that the diet is packaged and shipped on the requested date, using the requested courier service, and documented on the applicable *diet checklist*.
 - Copies of orders for “insects and diet” or “diet only” shall be placed on the *diet clipboard* and the information transcribed onto the *diet order form* (also on the clipboard).
- 2.27.4 Insects shall not be distributed to clients until QC screening for the cohort/family has been completed by the QCU.
- 2.27.5 Upon completion of the shipment(s), the printed *originals* shall be stamped as “Completed”, signed and dated by the applicable technician, then placed into the out-box designated as either “Completed Internal Orders” or “Completed External Orders”, as applicable. The red flag on the original email message from the client shall be changed to “✓”, then electronically filed in a folder labelled with the client’s name. The paper “copy” of the order shall be maintained alphabetically in the file cabinet by the name of the client.
- 2.27.6 At the end of each month, IPU personnel shall transfer the contents of the out-boxes for completed internal and external orders to the IPU supervisor who will make copies of those not already paid by credit card and provide them to the GLFC finance department for billing



according to the current fee schedule. The IPU supervisor will ensure that all *originals* of completed orders are filed in the binder for the current year labeled as "Vote-Net-Revenue".

2.28 Shipping Insects and Prepared Artificial Diets

- 2.28.1 For clients internal to GLFC, IPU personnel shall telephone those who have not picked up their orders by the end of the day on which they requested to have the materials available. An email shall be sent to those who cannot be contacted by telephone.
- 2.28.2 For shipments external to GLFC:
- a) Materials shall be packaged to prevent crushing, stacking/nesting of diet cups, drying and shifting during transit.
 - b) During winter months, packages shall be identified with stickers specifying that they should not be frozen; heat packs shall be added to packages containing insects and/or diet; these heat packs shall be separated from insects and diet using paper toweling (i.e., they shall never be in direct contact). Ice packs shall be included in the package when clients require insects to remain in diapause during transit.
 - c) IPU personnel shall ensure that requested materials are shipped using the courier service and method requested by the client. IPU personnel are required to generate on-line electronic waybills using the applicable courier website. Two electronic waybills shall be printed, one to affixed to the package and the other to be archived with client records.
 - d) Packages shall be labeled with both the client shipping address and the IPU return address and shall be brought to the GLFC mail room by noon on the day of shipping.
 - e) Refer to 2.28.3 and 2.28.4 for additional requirements for international shipments.
 - f) On the date of shipping, IPU personnel shall send an email to the client indicating courier tracking information and shipping charges (if not being charged to the client's courier account).
- 2.28.3 All international shipments shall have the following additional documentation included in a clear envelope that is used to attach the waybill to the outside of the parcel:
- a) a copy of the client's import permit (when applicable)
 - b) any other required documentation required by a government agency from the country of destination (for countries other than the U.S., call the courier company to establish whether or not additional forms or labeling are required for that particular country)
 - c) three copies of a commercial invoice



- d) a list of the diet ingredients applicable to the type of insect diet in the package
- 2.28.4 Shipments to U.S. destinations shall have the following additional documentation applied to the outside of the package in such a way that they will not be damaged when the parcel is opened by customs or homeland security:
- a) electronic waybills for two destination generated using the applicable courier website (the first to a USDA inspection station and the second to the shipping address requested by the client)
 - b) red-and-white import permit sticker supplied by the client.

2.29 Customer support

- 2.29.1 Shipments of insects to new clients shall include literature for *Care Instructions* for that particular species. Other IPS promotional materials may be included at the discretion of the individual preparing the package.
- 2.29.2 Client queries (received by email, telephone, or website) shall be directed to either the IPU supervisor or to the individual responsible for the insect colony in question. Personnel shall endeavor to respond within two business days.
- 2.29.3 IPU personnel may respond to client queries regarding insect or diet QC by consulting applicable QCU reports, or forward them to the QCU for response.
- 2.29.4 All correspondence for client queries relating to potential QC issues shall be printed out or written down by IPU personnel, maintained in a binder labeled as "Client QC Queries", and shall be copied to the QCU.

2.30 Quarantine Facility

IPU personnel may enter the IQ facility upon receipt of training by the BSO and authorization by the BSO or IPS manager (refer to the current version of SOP Number IPS/030, *Insect Quarantine Facility Access Authorization*).

2.31 Calculations

The 6% bleach cleaning solution used throughout this SOP has a final sodium hypochlorite concentration of 0.3%. Bleach stock material with a 5.25% sodium hypochlorite concentration (e.g., Javex[®]) shall be diluted by combining 60ml bleach and 940ml water (i.e., 6% dilution). Bleach stock material with a 6.0% sodium hypochlorite concentration (e.g., Ultra Javex[®]) shall be diluted by adding 53ml bleach and 947ml water (i.e., 5.25% dilution). If another brand of bleach is used, volumes may need to be adjusted to provide a 0.3% sodium hypochlorite working solution.

[Note: minimum contact time of 10 minutes is required for effective sanitation]



2.32 Documentation and Reporting

- 2.32.1 Compliance to the SOP shall include completion and/or maintenance of the following forms, logs, files and binders:
- a) Binder for *Bi-Weekly Checklists*, including IPS Form Number 0020/008 (Appendix 3).
 - b) Binder for *Monthly Checklists*, including IPS Form Number 0019/006 (Appendix 4).
 - c) Equipment logbooks for each piece of equipment used in the IPU.
 - d) Inventory of non-perishable supplies that are maintained in IPS storage rooms (i.e., excel spreadsheets).
 - e) Overtime forms for IPU personnel.
 - f) Binder for results of air sampling.
 - g) Binder for results of insect QC screening.
 - h) Binder for results of QC screening for diet ingredients or prepared diet.
 - i) Binders for tracking sheets for each insect colony.
 - j) Binder for client QC queries.
 - k) File box with waybills for shipments.
 - l) Files for each external client.
 - m) Binder of completed external client orders.
 - n) Binder of completed internal client orders.
 - o) Electronic files of completed client orders
- 2.32.3 Sanitation procedures identified in section 2.14 shall be documented on the *Bi-Weekly Check List*.
- 2.32.4 Sanitation procedures identified in section 2.15 shall be documented on the *Monthly Check List*.
- 2.32.5 Maintenance or repair actions performed on equipment shall be documented in the applicable equipment logbook.
- 2.32.6 IPU personnel shall comply with all other documentation and reporting requirements specified in the SOPs referenced in section 8.0.

3.0 DISTRIBUTION AND ARCHIVING

3.1 Distribution

This SOP shall be distributed by the IPS manager to all IPU personnel.

3.2 Archiving

- 3.2.1 The IPS manager shall maintain a historical copy of this SOP when it is replaced by a new version.
- 3.2.2 The IPU supervisor shall ensure that files of all documentation identified in 2.32.1 are maintained for expedient retrieval.

3.3 Destruction of Outdated SOPs



When new versions of this SOP are available for distribution, all persons in possession of a controlled copy shall ensure the retired version is returned to the IPS manager upon request.

4.0 ASSURING SOP VALIDATION AND COMPLIANCE

4.1 Responsible Individual

- 4.1.1 The IPU supervisor is responsible for assuring that this SOP is valid.
- 4.1.2 The IPU supervisor is responsible for assuring that this SOP is followed by IPU personnel and that these persons have been appropriately trained in its use.
- 4.1.3 IPU personnel are responsible for complying with procedures specified on a *Controlled Copy* of this SOP and shall never use non-controlled copies which could be outdated.

5.0 REVISION OF THE SOP

5.1 Responsible Individual

The IPU supervisor is responsible for assuring that this SOP is current. If necessary, the IPU supervisor shall initiate the revision process.

5.2 Revision Schedule

This SOP shall be revised when its provisions no longer agree with current practices or GLFC policies, and shall be approved by the IPS manager.

6.0 CONTINGENCIES

When IPU personnel find circumstances that do not permit compliance with this SOP, the IPU supervisor shall be consulted.

7.0 CONFIDENTIALITY

IPS SOPs are not considered to be confidential documents and may be distributed to outside parties. *Controlled Copies* shall not be reproduced.

8.0 REFERENCES

- a) Current version of SOP Number IPS/001 (*Environmental Chambers and Rearing Rooms*).
- b) Current version of SOP Number IPS/010 (*Preparation of Artificial Diets*)
- c) Current version of SOP Number IPS/030 (*Insect Quarantine Facility Access Authorization*).
- d) Current version of IPS Form Number 0141 (*Insect Production Services Sign-in Form*).

9.0 APPENDICES

- Appendix 1: Insectary Floor Plan
- Appendix 2: Insectary Room Purpose



*Great Lakes Forestry Centre
Insect Production Services*

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Appendix 3: IPS Form Number 0020/008 (*Bi-Weekly Checklist*).

Appendix 4: IPS Form Number 0019/006 (*Monthly Checklist*).



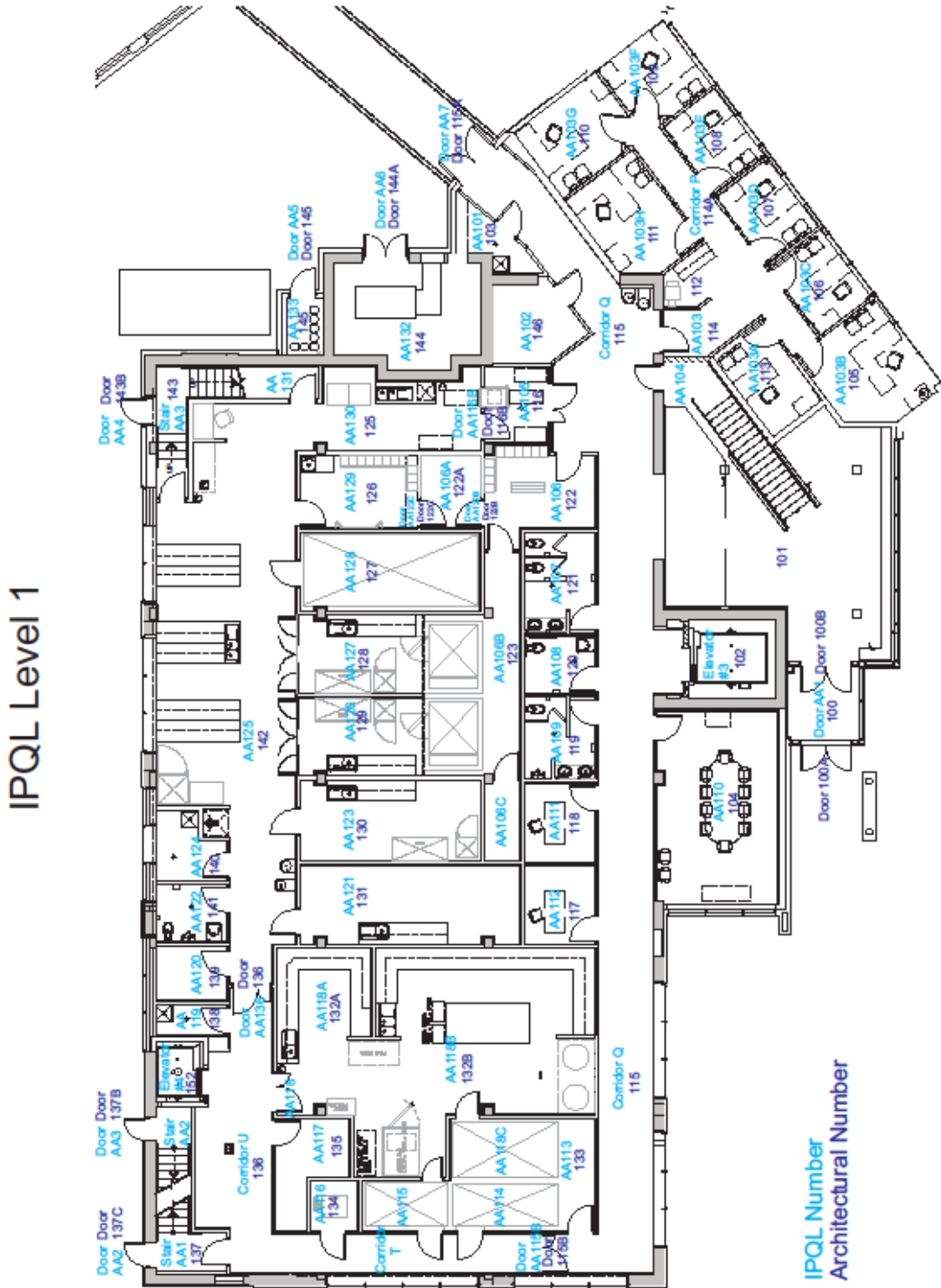
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Appendix 1a Insectary Floor Plan – Level 1



IPQL Level 1

IPQL Number
Architectural Number



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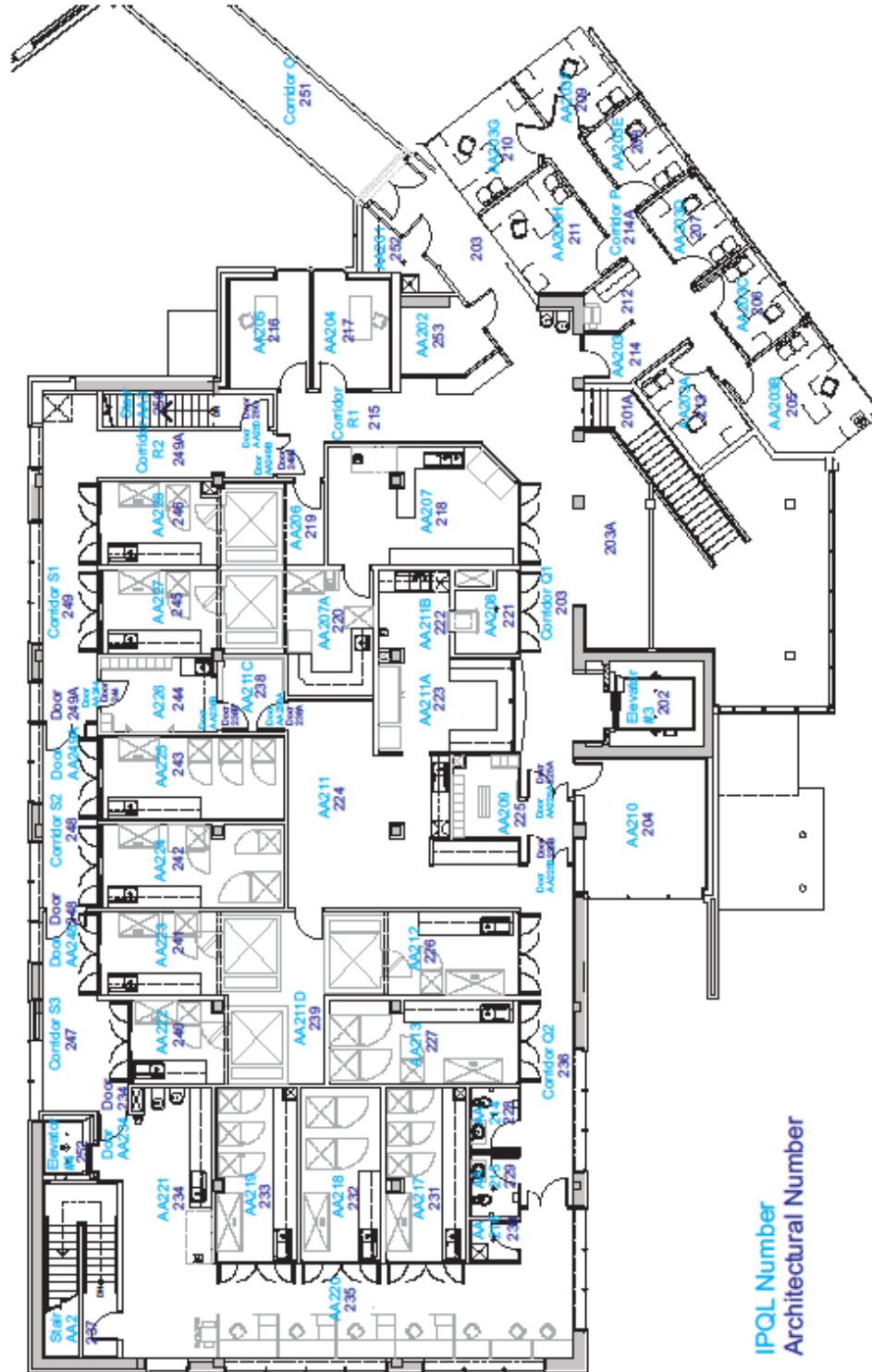
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Appendix 1b

Insectary Floor Plan – Level 2

IPQL Level 2



IPQL Number
Architectural Number



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Appendix 2

Insectary Room Purpose

Room Number	Architectural Number	Room Name	Room Purpose
AA202	253	Electrical Room	This room is used by GLFC maintenance personnel, however it also houses a clean-out canister for the portion of the central vacuum system located on the east side of 2 nd floor of the insectary.
Corridor Q1	203	Corridor	IPU personnel remove footwear and place them on the provided boot trays before entering the locker room. Materials/supplies are removed from the exterior packaging before entering the locker room or pass-through window. The wall phone is for GLFC clients to announce their arrival at the pass-through window for receipt of insects/diets.
AA209	225	Locker Room	This is a mixed gender change room for use by IPU personnel, GLFC facilities staff and escorted visitors to enter/exit the insectary. Access is by swipe card. Personnel remove jackets/coats and leave them in the provided lockers along with any personal articles. Facilities personnel and visitors don lab coats and shoe covers. A sticky floor mat is intended to reduce debris brought into the insectary.
AA208	221	Autoclave Cleanout	This room is used for waste disposal from the pass-through autoclave, or for sterilizing materials prior to entering the insectary. The body of the autoclave is located within this space to facilitate maintenance personnel not needing to enter the insectary.
Corridor Q2	236	Corridor	IPU personnel don lab coats and wireless phones, which are both located on wall racks near the entry door. The door between Q2 and AA220 segregates an area of greater cleanliness.
AA211	224	Training Room	Meeting area/break room for insectary personnel. This is also where IPU and maintenance personnel remove/store laboratory footwear before proceeding through an ante-room on their way into the quarantine



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Room Number	Architectural Number	Room Name	Room Purpose
AA211D	239	Service Core	This space houses a clean-out canister for the portion of the central vacuum system located on the west side of 2 nd floor of the insectary, as well as the mechanical compartments of several walk-in environment chambers.
AA211C	238	Anteroom	This is one of two entrances to the quarantine zone. It is dedicated to insectary personnel trained in quarantine procedures. It is integrated into the containment barrier to prevent the escape of insects. Doors are interlocked doors; lights go out when either door is opened; UV light and sticky traps are present; wall mounted mirrors are present for examining clothing to ensure that there are no hitchhiking insects when leaving the quarantine zone; access is by swipe card.
AA226	244	Change Room	This is a mixed gender change room for insectary personnel to apply laboratory clothing, wash hands (hands-free sink), and for examining clothing to ensure that there are no hitchhiking insects when leaving the quarantine zone. Privacy is not necessary since this space will only be used to apply lab coats, smocks or gowns. An air curtain is installed above the door to the anteroom to prevent the escape of insects.
AA211A	223	Shipping Room	This space is used for temporary cold/freezer storage of insects/diets prior to pick up or shipping. Materials for shipment are packaged and labelled in the area. The pass-through window is for distribution of insects/diets to local clients, or for receipt of materials/supplies by the IPU.
AA211B	222	Clean-up Area	This area is fitted with a dishwasher, sink and pass-through autoclave for cleaning/sterilizing laboratory materials and equipment.



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Room Number	Architectural Number	Room Name	Room Purpose
AA212 AA213	226 227	Methods Development Modules	These modules are used for initiating new insect colonies from field-collected insects or from other insectaries, and for developing associated rearing methods. These modules are considered “dirty rooms” because of potential pathogens harbored within the insects and plant materials. Colonies are segregated by module to reduce the incidence of spread of disease between colonies. Modules are fitted with reach-in or walk-in environmental chambers, biological safety cabinets, work benches, sinks and storage space.
AA214 AA215	228 229	Staff W/R	These washrooms are used exclusively by insectary staff, thus minimizing their necessity to leave the facility.
AA216	230	Janitor Room	Equipment and supplies in this janitor closet are dedicated to the 2 nd floor of the insectary. It is fitted with a slop-sink, janitor pail and cleaning supplies.
AA217 AA218 AA219	231 232 233	Domestic Colony Modules	These modules are dedicated to the rearing of various insect colonies. Colonies are segregated by module to reduce the incidence of spread of disease between colonies. Modules are fitted with reach-in and/or walk-in environmental chambers, biological safety cabinets, work benches, sinks and storage space.
AA220	235	Admin/Records	Work stations in this area are for record keeping duties of insectary workers. A sticky floor mat, located at the entrance to this area, is intended to reduce debris brought further into the insectary. This work space also provides access to several domestic colony modules.
AA221	234	General Work Room	The General Work room is a laboratory space supporting various insectary activities. It houses a lab bench, chemical fume hood and an elevator for accessing the 1 st floor.



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Room Number	Architectural Number	Room Name	Room Purpose
Stair AA2	237	Stairs	This stairway provides access between the 1 st and 2 nd floor, but not to the basement. It has an exterior door for emergency egress.
Elevator #4	252/152	Elevator	This elevator provides access between the 1 st and 2 nd floor, but not to the basement.
Corridors S3 and S2	247 248	Corridors	These corridors provide access to domestic colony modules.
AA222 AA223 AA224 AA225	240 241 242 243	Domestic Colony Modules	These modules are dedicated to the rearing of various insect colonies. Colonies are segregated by module to reduce the incidence of spread of disease between colonies. Modules are fitted with reach-in and/or walk-in environmental chambers, biological safety cabinets, work benches, sinks and storage space. As more space is required in the quarantine facility, these modules have the potential to be converted from insectary use (two modules at a time) by closing and alarming corridor doors and changing the air pressurization from positive to negative.
AA113	133	Service Core	This space houses a clean-out canister for the portion of the central vacuum system located at the west end of 1st floor of the insectary, as well as the compressors for the 3 cold rooms located nearby.
Corridor T	NA	Corridor	This corridor provides access to 2 cold rooms and a mechanical room. It permits access to the cold room for prepared artificial diets (AA115) so that the diet kitchen is not entered unnecessarily. It also serves as an emergency exit route from corridor Q.
AA114	NA	Cold Room	This cold room maintains various domestic insect species in their diapause stage.
AA115	NA	Cold Room	This double-entrance cold room is used to store our prepared artificial diets. Prepared diets are brought in via the diet kitchen. Diets are retrieved for use in the insectary via the entrance on corridor T.



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Room Number	Architectural Number	Room Name	Room Purpose
AA116	134	Mechanical Room	The steam generator for autoclave in the diet kitchen is located here.
Corridor U	136	Corridor	This corridor provides access to the diet kitchen, storage room, janitor room and elevator. It also serves as the emergency egress route from the quarantine facility (room AA125).
AA117	135	Storage Room	This storage space is used to store limited quantities of supplies for use within the insectary
AA118A	132A	Diet Preparation Room	This space is used for the preparation of raw diet ingredients (e.g., weighing, toasting, vacuum sealing, etc.). It houses a chemical fume hood.
AA118B	132B	Diet Kitchen	This space is used for the manufacturing of artificial diets. It houses mixers, kettles, and autoclave, and also provides access to two cold rooms.
AA118C	NA	Cold Room	This cold room holds raw diet ingredients.
AA119	138	Janitor Room	Equipment and supplies in this janitor closet are dedicated to the 1 st floor of the insectary. It is fitted with a slop-sink, janitor pail and cleaning supplies.
Basement	NA	Basement	A large portion of the basement is dedicated to storage of materials and supplies used in the insectary and quarantine facilities. This space also houses equipment used to supply our compressed air system, vacuum pump and RO system. The mechanical room for elevator #4 is located here.



Appendix 3

Monthly Checklist

Month:

Task	Initials	Date DD/MM/YY
Storage room and basement Supply Inventory taken (April and September only)		
Compare Delta System with NIST readings <input type="checkbox"/> Reach-ins <input type="checkbox"/> Walk-ins <input type="checkbox"/> Cold-rooms		
Diet Ingredient Inventory taken; Excel file updated, printed, filed		
Transfer contents of "Outboxes" to IPU Supervisor		
Shelves wiped-down in cold-rooms <input type="checkbox"/> Ingredients AA118C <input type="checkbox"/> Prepared Diet AA115 <input type="checkbox"/> Diapause AA114		
Shelves cleaned in all fridges (sprayed with bleach)		
Nilfisk vacuum cleaners (empty canister and check HEPA filter) <input type="checkbox"/> AA113 <input type="checkbox"/> AA202 <input type="checkbox"/> AA211D		
Check fire extinguishers <input type="checkbox"/> #1 Corridor-U <input type="checkbox"/> #2 Corridor-U <input type="checkbox"/> #3 AA221 <input type="checkbox"/> #4 AA220 <input type="checkbox"/> #5 AA211 <input type="checkbox"/> #6 Service Core AA211D <input type="checkbox"/> #7 AA118A		
Check emergency shower <input type="checkbox"/> IQ Corridor-S1		
Check eye-wash stations <input type="checkbox"/> Diet Kitchen AA118A <input type="checkbox"/> General Work Room AA221 <input type="checkbox"/> IQ S1		
Check first aid kits <input type="checkbox"/> Diet Kitchen AA118A <input type="checkbox"/> General Work Room AA221		
Tea towels exchanged at sinks and washed		
Check panic bar alarms <input type="checkbox"/> AA115B <input type="checkbox"/> AA2 <input type="checkbox"/> AA249B <input type="checkbox"/> AA249A		
Check screens in sinks and chamber drains (2 nd Floor Quarantine)		
Vacuum screens on air supply/return ducts (2 nd Floor Quarantine)		
Check RO water system in basement (maintenance and filter alarms)		
Check battery on emergency lighting (room AA211D)		
Archive IPS sign-in forms located at front door		

IPU Supervisor

(This checklist must be approved by IPU Supervisor before being archived)

IPS Form Number 0019/006



STANDARD OPERATING PROCEDURE

IPU Personnel Responsibilities

SOP Number: IPS/009/003/

Effective Date: 19 Jan 2015

Appendix 4

Bi-Weekly Checklist

Month: _____

Week Dates: _____

IPU Supervisor

Task	Initials	Date DD/MM/YY
Delta system printouts taken and filed		
Interior of reach-in chambers vacuumed and wiped IPU: <input type="checkbox"/> AA21701 <input type="checkbox"/> AA21702 <input type="checkbox"/> AA21801 <input type="checkbox"/> AA21802 <input type="checkbox"/> AA21901 <input type="checkbox"/> AA21902 <input type="checkbox"/> AA21903 <input type="checkbox"/> AA22202 <input type="checkbox"/> AA22401 <input type="checkbox"/> AA22501 <input type="checkbox"/> AA22502 <input type="checkbox"/> AA22503 MD: <input type="checkbox"/> AA21301 <input type="checkbox"/> AA21302 IQ: <input type="checkbox"/> AA22702 <input type="checkbox"/> AA22802		
Interior of walk-in chambers/cold-rooms vacuumed and mopped IPU: <input type="checkbox"/> AA22201 <input type="checkbox"/> AA22301 <input type="checkbox"/> AA11401 <input type="checkbox"/> AA11501 <input type="checkbox"/> AA11801 MD: <input type="checkbox"/> AA21201 IQ: <input type="checkbox"/> AA22701 <input type="checkbox"/> AA22801		
Environmental chamber and cold-room door handles wiped		
Alarm limits checked on environmental chambers		
Lab coats laundered <input type="checkbox"/> Insect <input type="checkbox"/> MD <input type="checkbox"/> Diet <input type="checkbox"/> QC <input type="checkbox"/> IQ (after autoclaving)		
Floors vacuumed and mopped (IPU, IQ 2 nd floor, stair case to diet kitchen, MD, IPU elevator)		
Bench tops bleached and windexed [®] (IPU, MD, AA226 and IQ 2 nd floor)		
Sinks cleaned: IPU: <input type="checkbox"/> AA217 <input type="checkbox"/> AA218 <input type="checkbox"/> AA219 <input type="checkbox"/> AA221 <input type="checkbox"/> AA222 <input type="checkbox"/> AA223 <input type="checkbox"/> AA224 <input type="checkbox"/> AA225 <input type="checkbox"/> AA211 <input type="checkbox"/> AA211B <input type="checkbox"/> AA118A <input type="checkbox"/> AA118B MD: <input type="checkbox"/> AA212 <input type="checkbox"/> AA213 IQ: <input type="checkbox"/> AA226 <input type="checkbox"/> AA227 <input type="checkbox"/> AA228		
Door handles wiped (rooms, corridors and entry/exit door handles)		
Light switches cleaned (IPU, MD and IQ 2 nd floor)		
BSCs vacuumed and glass wiped (vacuum under work-top panels, windex [®] glass sashes) IPU: <input type="checkbox"/> AA217 <input type="checkbox"/> AA218 <input type="checkbox"/> AA219 <input type="checkbox"/> AA222 <input type="checkbox"/> AA223(2) <input type="checkbox"/> AA224 <input type="checkbox"/> AA225 MD: <input type="checkbox"/> AA212 <input type="checkbox"/> AA213 IQ: <input type="checkbox"/> AA227 <input type="checkbox"/> AA228		
Lab shoes and shoe racks cleaned <input type="checkbox"/> IPU <input type="checkbox"/> IQ 2 nd Floor <input type="checkbox"/> MD		
Telephones cleaned Landlines: <input type="checkbox"/> Desks (5) <input type="checkbox"/> Kitchen <input type="checkbox"/> Training room Wireless: <input type="checkbox"/> IPU(8) <input type="checkbox"/> IQ 2 nd Floor (6)		
Keyboards, mouse and screen cleaned (IPU, MD and IQ 2 nd floor)		
Microscopes cleaned (IPU, MD and IQ 2 nd floor)		
Mating cage misting bottles cleaned and filled with sterile water <input type="checkbox"/> week 1 <input type="checkbox"/> week 2		
IPU Washrooms cleaned and stocked with amenities <input type="checkbox"/> Men <input type="checkbox"/> Women		
Balances cleaned <input type="checkbox"/> IPU <input type="checkbox"/> MD		
Door windows windexed [®] (including modules, link, corridors)		
Insect display case windows windexed [®] (both levels)		
Autoclaves maintained <input type="checkbox"/> flush steam generator for diet kitchen autoclave, empty drain screen <input type="checkbox"/> flush 2 nd floor autoclave, empty drain screen		
Confirm function of UV light (room AA211C)		
Check sticky trap for insects (room AA211C)		

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