The University of Pennsylvania is required under its “Assurance of Compliance with PHS Policy on Humane Care and Use of laboratory Animals by Awardee Institutions” (No. A3079-01); and under its conditions of accreditation by the Association for Assessment and Accreditation of Laboratory Animals, International (AAALAC) to prepare a disaster plan that takes into account both animals and personnel in the animal facility. In addition, a disaster plan is a requirement of the Guide for the Care and Use of Laboratory Animals (NRC, 2011).

Flooding
Vivaria are at risk of major or minor flooding from the following causes:
1. **Water main breaks** adjacent to underground vivaria. Most Penn vivaria are near to major water mains.
2. **Torrential downpours** often involve water flow into underground vivaria or into aboveground vivaria when roofs fail.
3. **Other water** sources such as sprinkler failure, failure of mechanical devices such as cage washers or plumbing/ drainage problems can result in flooding.

Vivaria do not have “water alarms” and detection of flooding will need to be by staff being watchful during their movements through vivaria. Some sump pumps have alarms and this will be helpful when they are present. The information below is a general plan which will need to be customized for each water disaster dependent on the source, scope and severity of flooding. If experiments or animals are lost or data is damaged due to flooding or relocation, ULAR will work with PIs to file for reimbursement with Penn Risk Management.

Water Disaster Management
During a flooding incident, a single “Water Disaster Commander” (WDC) will customize the action plan for ULAR based on the specifics of the incident and will direct staff actions. This will be the Associate Director for Vivarial Facilities and Planning, Mr. Derrick Dow. If Mr. Dow is unavailable, the ULAR Husbandry Manager of the affected vivarium or the Director of ULAR, Dr. Diane Gaertner, will serve as WDC.

The key point of contact for School leaders or individual concerned PIs during a water disaster should be Mr. Dow. Mr. Dow will also decide when it is time to notify scientists. If water is confined and does not enter animal rooms, it may not be necessary to notify scientists. If water invades animal rooms or if any animals must be relocated, scientists should be informed as soon as possible after the water containment/clean-up has been initiated. If Mr. Dow is unavailable, leaders and scientists shall contact Dr. Gaertner. When possible, Mr. Dow or Dr. Gaertner will keep leaders and affected scientists informed by e-mail at major progress points during major water emergencies.

Action Plan: **Rupture of a Water Main**
   a. In the event of a water main rupture, School Facilities Representatives routinely contact Mr. Dow and E-mail notification goes out to all ULAR Managers. BA’s for buildings confirm that ULAR Managers are informed.
   b. Mr. Dow and Managers will rapidly consider whether a vivarium is at risk for flooding.
   c. Mr. Dow discusses risks and initiates first actions with Manager for that vivarium, which will include:
i. assessing the source, direction and magnitude of flood in consultation with School facilities;
ii. establishing initial patrols of locations (halls, rooms, other) most likely to flood first;
iii. making plans to provide drinking water to all animals if water shut-off is expected; and,
iv. discussing options for relocations of animals within affected vivarium.

d. Mr. Dow will also decide when it is time to notify scientists. If water is confined and does not enter animal rooms, it may not be necessary to notify scientists. If water invades animal rooms or if any animals must be relocated, scientists should be informed as soon as possible after the water containment/clean-up has been initiated. Mr. Dow will decide if it is necessary to temporarily eliminate scientists’ access to animals during containment/cleanup. Scientists will be informed by email using the Polaris lists about the water disaster AND special instructions will be posted on the entry door to the vivarium for the duration of the emergency.

Reporting

a. If veterinary care or other non-husbandry staff notices flooding, they will immediately report this to the Animal Husbandry Manager or Supervisor for the area. If the Manager or Supervisor is not available, they will report the problem to the Associate Director for Vivarial Facilities and Planning (Dow) or the Director of ULAR (Gaertner).

b. Upon detection of water in any vivarium, the first Husbandry staff action shall be to call FRES and report the problem. In that report they will emphasize that this is an urgent situation because the flooding is happening in a vivarium and may endanger animal welfare and research integrity. In addition to this phone call, they will immediately follow up with an e-mail to FRES for documentation purposes. They will also inform the School Building Administrator for that building by both e-mail (for documentation purposes) and by phone (for quick response). ULAR staff will then notify the ULAR Facility Manager for that vivarium and Mr. Dow so that he can advise them regarding further action and lead the actions as WDC.

Staff actions after reporting flooding to FRES, School and the WDC:

a. Staff will then start to clean up/remove the water while waiting to make sure that FRES responds. If FRES has not responded within 20 minutes, or if the rapidity/severity of flooding increases, a 2nd call will be placed. Wet vacuums are available in some locations and can be used to help clean up water.

b. The WDC will inform the Director as soon as possible after a flood is identified and will inform her of the plans.

c. All ULAR members, including the Director of ULAR and Associate Directors, act upon the instructions of the WDC during the flooding emergency. If members of ULAR leadership or other ULAR members have suggestions for flood management or specific worries, these are channeled through the WDC for unified action.
d. The WDC is responsible for directing the oversight of physical welfare of the animals, including scheduled checks of all animals during and after the water disaster and reporting any animals as sick. This may include housing staff on campus or close to animals if needed.

e. The Associate Director for Veterinary Care and Training will ensure that animals continue to be provided adequate veterinary care during the water disaster.

f. The Associate or Assistant Director for Rodent QA will assist the WDC in deciding what locations may be appropriate if animals must be moved to remove them from flooding. After the water emergency is over, they will decide if additional health monitoring is necessary.

g. If animals must be moved, the following actions will happen:
   1. Investigators whose animals are housed in the building will be informed via e-mail.
   2. The WDC will close the affected vivarium to scientist access to minimize potential contamination of animals.
   3. Racks of animals will be covered prior to movement whenever possible.
   4. The Associate Director for Rodent QA will determine if additional post-emergency QA monitoring is needed to make sure that relocated animals were not exposed to exogenous infectious agents.
   5. The WDC will inform the Director of ULAR throughout this process and will inform scientists when animals have been returned to their regular housing areas and when scientists again have access to vivaria after flooding has been resolved.

G. Animal Evacuation Principles and Contingencies
1. In the case of an unforeseen emergency, research animals will be monitored by the ULAR Director’s Team, involving veterinary staff as needed. Veterinary staff will make assessments regarding quality of life and husbandry schedules will be altered to provide essential care for animals.

2. Animals may be moved to consolidate into fewer locations or relocated into adjacent areas with functioning utilities. Animals will only be moved when the environmental conditions are deemed a greater hazard than possibly confounding the scientific objectives.

3. Animals will only be evacuated if there is no other recourse and if doing so will not put human lives or safety in danger.
4. Euthanasia supplies are readily available; however, all possible support and care will be provided before making the decision to euthanize research animals in the face of a crisis.

*If euthanasia is the only option for humane treatment of the animal census or portions thereof, ULAR and OAW will work with the administration and scientific representatives to prioritize colonies to maintain and others to depopulate.*