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## Control and Prevention Program for Bed Bugs

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# Affordable Housing Control and Prevention Program for Bed Bugs

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**BED BUGS** continue to plague affordable housing nationwide, despite advances in detection and treatment strategies. A new program seeks to reduce the bed bug burden, allowing residents to enjoy a lifestyle free of the constant struggle with this pest.



**I**N 2019, Philadelphia was named the No. 1 bed bug-infested city in the United States, an unacceptable distinction to the folks at Allergy Technologies and Philadelphia Councilmember Mark Squilla. A preventive-based, two-year bed bug program was developed and supported, in part, by donations of material goods from Allergy Technologies and from collaborating sponsors: Rockwell Labs Ltd., Bayer Environmental Science, Target Specialty Products, and MGK. The objective of this program was to confirm this as an affordable and sustainable model of control and prevention of bed bugs at the community level within affordable housing.

A community-living complex in Philadelphia was selected as the initial demonstration site. It is a HUD property managed by an outside management firm (OMF). This site consists of a 26-story senior tower containing 165 units. These residents are mostly older with preexisting medical conditions, many requiring medical assistance from outside services.

Surrounding the tower are 38 townhome buildings (305 units), each containing from four to 14 units housing primarily low-income families. There is frequent visiting between the tower and the surrounding townhomes in this multi-generational housing community.

In total, 470 units are involved in the demonstration. Products used to detect or control bed bugs were selected based upon field-proven efficacy, low environmental impact, and long residual activity.

A key to the success of this two-year demonstration is the sustained cooperative effort put forth by the functional groups working for a common cause, including Allergy Technologies, the OMF, PMP service provider (Corbett Exterminating), canine inspection team (Key K-9), staff and resident educators (Northeastern IPM Center StopPests in Housing), and the complex residents and resident council representatives.

## Conducting the Demonstration

To manage the 470 units in this initial demonstration, the housing complex was divided into four manageable quadrants (Quads I, II, III and IV), comprising units of fairly equal size.

## Training: Pre-Phase I

Training to both staff and residents facilitated cooperation and enhanced engagement by the residents. The Northeastern IPM Center “StopPests in Housing” program provided training to housing staff and residents.

Common problems in affordable housing are language and cultural barriers. Residents spoke several languages, so training materials were provided in most languages spoken by residents: Cambodian, Chinese (Cantonese and Mandarin), English, Japanese, Korean, Spanish, and Vietnamese. Multilingual tenants were recruited to assist with translation and to address questions raised.

## Inspections: Phase I

Canine screenings of all units with subsequent visual confirmatory inspections were used. All bed bug-positive alerts were visually confirmed afterward by a trained PMP to validate the presence of live bed bugs and/or signs

## Bed Bug Infestation Grading Scale

0=Negative	No bed bugs observed
1=Introduction	1 location within a unit or common area ≤ 5 bed bugs with no multiple life forms
2=Mild infestation	1–2 locations within a unit or common area ≥ 5 live bed bugs, multiple life forms may be found
3=Moderate infestation	3–5 locations within a unit or common area ≥ 5 live bed bugs, multiple life forms may be found
4=Major infestation	≥ 5 locations within a unit or common area ≥ 5 live bed bugs, multiple life forms may be found





### Example found during Phase I

*Bed Bug Grade 2: One to two locations, with more than five bed bugs and with eggs and multiple life forms.*

## Summary of Demonstration Details (2020)

	Quad I	Quad II	Quad III	Quad IV
# Units	165	123	97	85
# Bedrooms	1-2	2-4	2-4	2-4
Total Liners Installed	191	290	224	194
# Units Heat-Treated	5	6	3	1
# Bed Bug Monitors Installed	595	591	485	393

of activity at specific locations. Bed bug infestations were also graded using the scale on page 18 during the initial visual validation process and throughout the demonstration.

Canine inspection was used to rapidly identify those units potentially requiring thermal treatment. After the initial inspection with canines, PMP visual inspections were used exclusively throughout the remainder of the two-year program.

### Treatment: Phase I

Heat treatment (Temp-Air Inc.) was the primary method used to eliminate bed bugs from any infested unit. Prior to thermal remediation, bed bugs were extracted by vacuum. The unit was then prepared, and the heat treatment, monitored by 24 heat sensors, was undertaken.

During the cooling-off period, each unit had preventive measures installed. CimeXa dust was injected into wall voids,

ActiveGuard Mattress Liners were positioned inverted on the box springs of each bed (or inverted on the mattress in the absence of a box spring), and BlackOut Bed Bug Detectors were placed under the legs of the headboard end of beds and any other selected sleeping surfaces in bedrooms and living room.

Normally, the PMP took approximately 15 minutes to install the preventive/detection measures while in the unit. Four successive visual inspections then occurred, each approximately 10 days apart, with a fourth inspection at about 60 days after treatment. Four consecutive inspections graded 0 represented that the bed bugs had been determined “cleared” for a particular unit.

### Preventive Measures: (Phase I)

Long-lasting bed bug control/prevention and detection measures were installed in every unit in the housing complex. These included ActiveGuard®

Mattress liners and CimeXa™ insecticide dust, both of which kill bed bugs for at least two years, and BlackOut Bed Bug Detectors, which capture bed bugs to indicate activity. For those units that have required initial thermal remediation, preventive measures were applied during the end of the heat treatment process.

### Surveillance: Phase II

Beginning in January 2021, all resident units undergo a monthly inspection by the PMP. Bed bug activity, or the presence of bed bugs in the monitors, and continued installation of ActiveGuard are checked. Inquiry is made of residents as to any suspected bed bug activity in their unit or common areas. If a mattress liner is missing, a replacement is installed.

All bed bug activity — detected as either live or dead, in monitors and on liners, including reports from residents — is recorded and triggers a more thorough PMP inspection. These inspections serve as the basis for the type of remediation required (localized chemical control vs. heat treatment) by the PMP. A data-driven decision to modify the frequency of monitoring to a quarterly basis in the future is being considered for those units that have not demonstrated any bed bug activity.

### Data Management

Data are collected on all details associated with the program and each living unit. Historical bed

bug infestation data for the initial demonstration site indicated that in 2018 and 2019 approximately 80–90 units were remediated for bed bugs annually. There were two COVID-19 related gaps in time when the program was placed on hiatus.

In March 2020, the OMF halted the canine screening of new units while allowing previously thermally treated units to continue to be monitored. The demonstration resumed in August 2020 with the remaining units being screened, treated when needed, and preventive measures installed. Between November 2020 and March 2021, the OMF assumed a similar position by halting the onset of scheduled monthly monitoring for bed bug activity, delaying its commencement until April 2021.

### Results: Year One (2020)

During the first 12 months of the program, 15 out of a total of 470 units were heat-treated. Also, three “resident newsletters” were distributed to all residents. A fourth newsletter with current results is in preparation.

These communications are designed to express sensitivity and assurance of adherence to all federal and local guidelines during the COVID pandemic, inform residents as to progress affected to date, and to reinforce enthusiasm, cooperativity, and engagement as to early reporting of any bed bug suspected activity.

*Continued on Page 22*



## Results: Year Two (2021)

The second hiatus, due to an increase in COVID cases throughout Philadelphia between November 2020 through March 2021, caused the OMF to delay the onset of monthly monitoring. The monthly bed bug inspections began in early April 2021 and yielded four bed bug-active units in Quad I.

Based on the grading results of infestations in these four units, the PMP “locally” treated three units with a combination of extraction,

steam, and the application of a bifunctional insecticide, while the fourth unit was heat treated. Mattress liners and monitors were replaced if missing.

Subsequently and throughout each month, every unit is inspected and remedial action taken if bed bugs are found.

Prior to this program, the four units with new bed bug activity would all have been automatically heat-treated. Early

detection and intervention coupled within a preventive strategic approach allows for a localized treatment that is timely, simpler and far more economical.

## Conclusions: Year 1

- ✓ Over 97 percent of the units did not have a reintroduction or reemergence of bed bugs.
- ✓ There was 81 percent reduction in the number of required thermal treatments with a minimum of \$40,000 savings to property management as compared to historical annual figures.
- ✓ PMP technician time on-site was reduced by approximately 40 percent, resulting from the program’s preventive, strategic approach.

## Conclusions: Year 2, in process

- ✓ 99.1 percent success rate in preventing infestations (only four units required remediation).
  - Only one unit required thermal remediation (a new tenant introduced bed bugs, and liners and interceptors were not yet present).
  - Only three units required localized treatment.
- ✓ The cost of the second year of the demonstration, without the need for the initial clean-out protocol and extremely low infestation rate, is expected to represent a \$100,000 saving, compared to historical expense.

This demonstration confirmed that the proposed program is an effective and sustainable model of control and prevention of bed bugs at the community level within affordable housing complexes. The program is easily reproducible and, while results may vary based upon site specifics, extraordinary reductions in bed bug incidents can be achieved and maintained with a streamlined pest management labor force, maximizing long-term results. **PP**

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For more information about Allergy Technologies’ ATAHCTM Preventive Program for Bed Bugs, call (215) 654-9988 or contact [info@allergytechnologies.com](mailto:info@allergytechnologies.com).

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