

APPENDEX C

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ENVIRONMENTAL HEALTH WATCH  
HUD HEALTHY HOUSE – COCKROACH ALLERGEN REDUCTION PROJECT  
November 30, 2003  
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Model Contractor Program
Cockroach Integrated Pest Management (IPM)
ENVIRONMENTAL HEALTH WATCH

Background: Integrated Pest Management (IPM) for Cockroaches

Status of IPM

- IPM is the state-of-the-art practice in the pest control industry.
- IPM is recommended by health, environmental and housing authorities.

Health Concerns Related to Cockroaches

- **Cockroaches** are a source of potent, pervasive and persistent allergens that trigger asthma attacks.

Old Approach - Monthly Spraying:

- **regular** pesticide application — whether roaches are present or not;
- **broadcast** application — spray baseboards, floors, walls;
- pesticides of worrisome **toxicity**.

Concerns Related to Pesticides

- Can contain chemicals that are lung irritants that trigger asthma attacks.
- Can contain toxic chemicals.
- Children are particularly susceptible and more likely to be exposed.
- Exposure potential:
 - **airborne** exposure from broadcast application of volatile pesticides;
 - residue remains on treated **surfaces**.

IPM Strategy

Inspection and monitoring —

- type and number of pests,
- entry points
- harborage
- food and water sources

Environmental controls —

- block entry points and vehicles
- reduce/eliminate food sources

- reduce/eliminate water sources
- reduce/eliminate harborages

Mechanical capture —

- sticky traps,
- HEPA vacuum

Pesticide use —

- only when needed
- least toxic
- smallest amount
- precision-targeted
- low-volatility
- areas inaccessible to occupants
- no broadcast application

Note -

- IPM may be more expensive initially, but will likely be the same or less expensive in the long run as the old approach.
- IPM may take longer, but will be more effective in the long run.
- Not every contractor who can spell IPM does it right.

General Contractor Guidelines:

- Conduct a visual inspection to determine the nature and extent of the roach infestation. Use sticky traps to guide and evaluate management efforts. Sticky traps by themselves can reduce the need for chemical use in small infestations.
- Do not use broadcast applications of pesticide - sprays, foggers or bombs.
- Do not apply organophosphate or chlorinated hydrocarbon pesticides.
- Do not use chemical flushing.
- Use a HEPA vacuum to remove roaches, roach debris (which attracts other roaches), and clean up food particles and dust. Do not use a regular vacuum. Vacuum before treating or baiting. Hot air from a hair dryer or heat gun can be used for flushing roaches from harborages.
- Apply borate dusts formulated for roach control into inaccessible areas, e.g., gaps behind wall-mounted cabinets, behind counter back-splashes, under the false floors of cabinets, into the motor cabinet and space under refrigerators and other inaccessible sites.
- Apply low-toxicity and low volatility paste or gel baits via syringe-type applicators or deploy bait stations as needed. Rotate baits to reduce the likelihood of behavioral resistance problems.
- Seal openings, cracks, or crevices where food debris can collect. Seal holes, cracks and crevices where roaches live and where there is roach debris. Some wall openings, cracks, and crevices can be left unsealed and used as locations to place gel baits. (May be sub-contracted.)
- Clean all roach excreta and food residue from hard surfaces. Follow procedures detailed below. (May be sub-contracted.)

- Provide information to the client on what materials are being used, why they are being used, and how they work. Make clear that do-it-yourself roach sprays will interfere with the effectiveness of baits.
- Provide information to the client on how to make their home less hospitable to roaches by denying them food, water and shelter. Bring the client into the solution of the problem rather than appearing to criticize their behaviors.

Service Delivery

Initial Service:

- Conduct visual inspection enhanced with deployment of sticky traps.
- Remove roaches and debris by HEPA vacuuming.
- Wash roach excreta and food residue from hard surfaces.
- Apply borates into cracks and crevices and voids
- Seal wall openings, cracks and crevices, as needed.
- Apply paste or gel baits as needed.
- Deploy sticky traps for population monitoring.
- Inform occupants about procedures and materials utilized.
- Provide occupants information on environmental controls.

Follow-up Service (at no additional charge): to evaluate the effectiveness of the initial treatment and to conduct additional monitoring and interventions that may be required. Following the initial comprehensive interventions, revisits should occur at 2 weeks (post-initial), 1 month, 2 months and 3 months. After these revisits, rechecks should occur every 4 to 6 months for ongoing contracts. For single service contracts, recheck only if there is a complaint.

The comprehensive intervention procedure (vacuuming, washing, etc.) may need to be repeated at 3 months (post-initial) and/or at 6 months post-initial), for an additional charge, depending on the original physical/sanitation conditions and the quality of ongoing maintenance of the IPM interventions.

Complaint Response: for six-months following the Initial Service, the contractor agrees to make additional follow-up visits (at no additional charge) in response to complaints by the occupant or by the contracting party of continued cockroach infestation. Obtain documentation of the nature of the complaint and the treatments applied.

Inspection Report

Based on the visual inspection and sticky trap survey, prepare a report, on a form provided by the contracting party, or acceptable to the contracting party, that provides the following minimum information for each dwelling unit:

- species of cockroaches

- intensity of cockroach infestation per room (average number of roaches captured per trap per day = number of roaches captured / number of traps set / number of days traps were deployed)
- locations of cockroach entry points and opportunities for exclusion
- location of harborages/nesting sites
- sanitation and maintenance level of the unit (including sources of problems)
- interventions undertaken (what, where, and when)
- next scheduled service
- detailed recommendations for occupants and building management regarding actions that each must take to abate the problem and why these actions must be taken

Treatment Specification

- Prohibited Treatments - the contractor is prohibited from the use of: 1) pesticide sprays, foggers or bombs; 2) chemical flushing and 3) application of any organophosphate or chlorinated hydrocarbon pesticides.
- Investigating all potential harborages is the first priority of the contractor. In small infestations, roaches are typically confined near sources of moisture (kitchens and bathrooms). In larger infestations, the contractor needs to turn over and inspect all furniture, partially disassemble appliances to access roaches, and investigate wall voids. Ignoring key active harborages can provide a constant source of reinvasion. The contractor should focus on likely living and breeding sites, not on where the roaches are seen in the home. Also inspect furniture, hollow table legs, conduit boxes, false ceilings, and machinery.
- Remove cockroaches, roach debris, food, other particulate and dust by HEPA vacuuming. Vacuum harborages, under, on top and around stoves and refrigerators, shelving, cabinet tops, electrical receptacles and switches, range vent hoods, floor/wall junctures, along baseboards, all around door and window frames, and other areas as needed. Hot air from a hair dryer or heat gun (less than 1,000 F) can be used to flush roaches from harborages. Do not use chemical flushing agents. When using hot air flushing, take care not to apply excessive heat to materials that could be damaged (e.g., paint, electrical wiring, and electronic components).
- Remove all roach excreta and other residues from surfaces.
 - Vacuum all horizontal surfaces with a HEPA vacuum before and after wet washing.
 - Wash roach stains from walls, ceilings, cupboards, doors, etc. Scrub-off stains with a detergent solution; remove the dirty wash solution with disposable rags; wring-out the dirty rags into separate bucket, not into the wash water. Rinse thoroughly with clean rise water and

clean rags. Wash again with a bleach solution (use $\frac{3}{4}$ cup of household bleach in a gallon of water, allow 10 minutes of contact time) and rinse. Follow bleach label precautions for skin protection and ventilation.

- For vinyl flooring, scrub with detergent solution. Mop up the dirty wash solution and wring into to separate bucket, not into wash water. Rinse thoroughly with clean rise water. HEPA vacuum.
- For carpeting, vacuum with HEPA vacuum very slowly (no faster than 4 minutes per 10 square feet).
- Apply borate powders into voids, electrical switch and receptacle boxes (install, seal and cover plates), and cracks and crevices. Borates are effective when very lightly dusted along a wall/floor juncture (e.g., at baseboards) and under/behind appliances where roaches are known to travel. Follow label instructions of all borate products.
- Seal openings, cracks, or crevices where food debris can collect. Seal holes, cracks and crevices where roaches live and where there is roach debris. Some wall openings, cracks, and crevices can be left unsealed and used as locations to place gel baits.

Sealing of wall voids in kitchens and bathrooms can be particularly important in achieving elimination. Use caulk or foam seal where sinks and fixtures are mounted to the floor or wall, cracks and crevices, baseboard molding and corner guards, where shelves and cabinets meet walls or door frames, pipe penetrations and other openings which provide entry to the unit or access to harborage. Use latex acrylic with silicone caulks to seal molding.

- As needed, apply baits using applicator syringes. Use baits from the approved list. Bait in areas of greatest roach activity, such as in food storage cabinets, under sinks, at smoke detectors and CO monitors, and on appliances (e.g., rear of gas cooking range).
- Location is critical in bait application. Cockroaches will feed on the first food they find, so it is important that they find the bait before other food sources. Thus, it is important to use many, widely distributed, small-sized application points (e.g., BB-sized dabs or 1/8 inch beads) rather than large smears of bait. Place bait beads as close as possible to harborages and feeding areas, adjacent to edges and corners.

Apply baits so that they are inaccessible to occupants and out-of-sight. Baits which can be used, include: Avert by Whitmire Micro-Gen Research Gel (active ingredient (a.i.) abamectin), Maxforce by Clorox (a.i. hydramethylnon), preempt

by Bayer (a.i. imidacloprid), Pro-Joe-S and MRF-2000 by Blue Diamond (a.i. boric acid), and Siege by American Cyanamid (a.i. hydramethylnon).

Contractor General Requirements

- The contractor shall provide all management, tools, equipment, materials, transportation and labor necessary to ensure that the pest control services are conducted according to these specifications.
- The contractor shall provide certified pest control personnel only, with training and experience in the conduct of IPM for cockroaches.
- All pest control materials used must be as specified or equivalents must be approved prior to use by the contracting party.
- All sub-contractors (e.g., cleaning; entry and harborage sealing) must be approved by the contracting party.
- All pest control products must be registered by the USEPA for residential use and must be applied according to the manufacturer's label instructions and in compliance with all applicable local, state and federal laws and regulations.
- The contractor shall provide the following:
 - Certificate of Contractor General Liability Insurance, with the contracting party named as an additional insured:
 - Certificate of Workers' Compensation Insurance.
 - Copies of current pest control licenses issued by the state.
 - Monthly report, on a form provided by the contracting party, on the service visits to each housing unit, including the date, name of technician, type of visit (initial, follow-up, complaint response), treatments, chemicals used and inspection findings.