

## **Sulfuryl Fluoride (Trade name- Vikane) A Cause for concern**

Many Family Student Housing (FSH) residents had serious concerns about the recent termite eradication because of the use of the toxic gas- Sulfuryl Fluoride, commonly known as Vikane. Here is an overview of the Category I nerve- toxin, Sulfuryl Fluoride- all the quotes are from governmental sites whose job is to assess risks of pesticides used and registered in the State of California.

1) **Problems of Exposure-** Vikane is approved by the Environmental Protection Agency (EPA) for structural fumigation use but it is also labeled as a “Toxic Air Contaminant (TAC)”. According to California Department of Pesticide Regulation (CDPR) it is also an “acute inhalation toxicity category I pesticide.” Integrated Pest Management (IPM) Policy of the State of California recommends to eliminate all EPA category I materials from use.

The toxin continuously leaks out in the open and has to be topped off in order to maintain a high level of it inside the tented structure. “Sulfuryl Fluoride is detectable in ambient air surrounding structures during all fumigation stages, at distances 5 to 50 feet away”. (CDPR) It is 3.52 times heavier than air. Residents were concerned that Vikane will settle down in their environment and cause health problems. It is also colorless and odorless. Residents will not be able to detect the pesticide in the air until symptoms appear. “During the application and aeration phases of a structural fumigation, non- worker bystanders, i.e., adjacent and nearby adult and child residents, have the potential for short- term exposure.”(CDPR)

Aeration of Vikane poses a lot of concerns: “First 2 hours of aeration the average ambient air concentration was 12ppm”. (CDPR) This is significant considering anything more than 5 parts per million of Vikane is considered unsafe for humans. “Measurable air concentration were still present in homes at 48 hours after aeration” (CDPR),” thus, there is the likelihood of short- term (seven days or less) as well as acute exposure to air concentration of Sulfuryl Fluoride.”(CDPR)

### **Symptoms**

Some of the common symptoms upon reentry are- “burning eyes, eye and throat irritation, nausea and difficulty breathing.” (CDPR) Improperly aerated structures show the symptoms of- “nausea, headache, vomiting, dizziness and chest pains.” (CDPR) Furthermore, “numerous cases show that even when the aeration period had expired and the buildings were cleared for reentry, symptoms and odor [from the added tear gas] were

still reported by residents.” (CDPR) “Sulfuryl Fluoride exposure has resulted in serious illness in California,” says the Office of Environmental Health Hazard Assessment (OEHHA).

### **Dangers of Even Less Than 7- Day Exposure**

Short- term inhalation exposure (7 day or less) to Sulfuryl Fluoride “may cause respiratory irritation followed by pulmonary edema (an accumulation of fluid in the lungs, which can cause death), nausea, abdominal pain, central nervous system depression, and numbness in extremities.” (EPA) National Institute of Environmental Health Sciences (NIEHS) warns us of “ possible effects of pesticides on the development of the immune, nervous and reproductive systems from fetal, newborn and childhood exposures.”

### **Who is most Susceptible?**

The Agency for Toxic Substances & Disease Registry warns us that “subsets of population that are susceptible to the effects of Fluoride in Vikane, include- the elderly and people with nutritional deficiencies & cardiovascular & kidney problems. Excessive fluoride levels linked to memory loss, Alzheimer’s, neurological impairment, kidney damage, cancer, genetic damage &more”. OEHHA reiterates that “individuals with a history of chronic respiratory diseases are at increased risk from exposure to sulfuryl fluoride” and that since “the brain is a primary target for sulfuryl fluoride toxicity. We are concerned that younger population may be especially sensitive to sulfuryl fluoride exposures.”

2) **Lack of Intermediate- Term Exposure Data-** Short- term exposure from Vikane is registered with CDPR as not to exceed 7 days. The fumigation plans for Storke were suppose to last for the whole month of August, making the expected exposure levels to fall under CDPR’s category of “ intermediate- term exposure- lasting more that 7 days but substantially less than 1 year.”(CDPR). The unavailability of any data on the “intermediate- term exposure” makes residents nervous for their own health and even more for the health of their children.

### **Assumption of exposure to only 1 fumigation per year**

Even OEHHA have asked CDPR to “consider evaluating chronic & subchronic exposures to bystanders since it is plausible that a family could live adjacent to more than one home being fumigated over the course of a year.” Seven different buildings were scheduled to be fumigated one after the other. Stroke residents- adults and children would have faced seven or even more times the exposure that is acceptable because five out of the seven buildings scheduled were many times bigger in size than an average house.

- 3) **Lack of Dermal Studies-** “Potential routes for human exposure to Sulfuryl Fluoride gas are inhalation, dermal, and oral, with inhalation being the major route.” But CDPR regrets that “no available studies address dermal absorption.”
- 4) **Lack of Cancer Studies-** No cancer studies were required to register Sulfuryl Fluoride as a pesticide with the EPA, the agency that assesses the risks of this nerve toxin.
- 5) **Effects on Food-** Many Storke gardeners are unsure about the quality of the food they are growing after it has been exposed to Vikane. “Data addressing the fate of Sulfuryl Fluoride in soil and biota is unavailable”. (CDPR) Although, it is proven that the “food exposed to Sulfuryl Fluoride have been shown to retain Fluoride residue”, and “foods with high fat content, such as corn oil- have demonstrated significant sorption of Sulfuryl Fluoride.” (CDPR)
- 6) **Offgassing-** “Offgassing from the treated commodities may occur”. (CDPR) for up to 45 days, according to some studies. Residues of inorganic fluoride have been found on soft surface household items such as rubber, feathers, rayon, and wool as long as 40 days after fumigation. (CDPR)
- 7) **Other Uncertainties-** OEHHA is also concerned about “the lack of developmental neurotoxicity study, unknown mechanism of action, lack of data on metabolites and their contribution to sulfuryl fluoride toxicity, lack of methods to measure the impact of cumulative toxicity of sulfuryl fluoride and other chemicals that degrade or metabolize to fluoride ion.”
- 8) **A Greenhouse Gas-** Last but not the least “no data directed to the environmental fate of Sulfuryl Fluoride” is available.” Only “limited information is available regarding any potential environmental breakdown products of Sulfuryl Fluoride” and that “sulfuryl fluoride has a long or very long atmospheric lifetime and should therefore, be considered a greenhouse gas” says the CDPR.

### **State of California sites on the Internet**

#### **All the quotes in this paper are from Governmental Agencies. The sites used are-**

Cdpr.ca.gov- California Department of Pesticide Regulation

Epa.gov- Environmental Protection Agency

Oehha.ca.gov- Office of Environmental Health Hazard Assessment

Niehs.gov- National Institute for Environmental Health Sciences

#### **Other useful sites-**

Pesticidereform.org- Californians for Pesticide Reform

BeyondPesticide.org

pesticideinfo.org  
Getipm.com  
panna.org  
pureheat.com

## **Viable Alternatives**

We came to Housing with not only our concerns regarding Vikane but also with the hope that “successful ways to reduce even eliminate hazardous pesticide use while keeping pest populations down are being used throughout California in farms, cities, forests, parks, and schools.” Californians for Pesticide Reforms (CPR) After the California Healthy School Act of 2000, even more schools, residencies, cities and organizations have adopted the Least- Toxic IPM. City after city has vowed to reduce or eliminate most acutely toxic pesticides, such as Vikane, and substitute alternatives and creative solutions that are perceived as less of a threat to public health and safety, with emphasis on non-chemical management. On January 27<sup>th</sup>, 04 even the Santa Barbara City Council approved a Least Toxic IPM, with the goal of becoming a pesticide- free city.

## **UCSB’s IPM Policy**

UCSB’s IPM Policy effective September 15<sup>th</sup>, 2000 advises to use an approach that “causes the least possible hazard to people and the environment” and “minimize use of pesticides”.

## **Thermal Pest Eradication**

“Since the days of Louis Pasteur, it’s been well- known that “heat kills”. Millions of lives have been saved through the technique of heating milk and other foods, destroying or otherwise deactivating bacteria. The application to this principle to our environment is a natural progression of that knowledge” says Dr. Richard Ashby, County Medical Director. Heat has been used since the 1950’s to eradicate unwanted pests in homes, schools, warehouses and the military establishment.

In 1990 two Professors from the University of California- Dr. Charles Forbes, Professor of Earth Sciences and Dr. Walter Ebeling, Professor of Entomology patented the Thermal Pest Eradication (TPE). Their studies proved that termites die within 7 minutes of exposure to a temperature of more than 100oF.

## **Precision Environmental, Inc.**

Over 150 residents signed the petition to stop Vikane fumigation in only two days and

use alternatives that are becoming popular all around us. Tropicana apartments that we are all familiar with used the heating method for termite- eradication very recently and are happy with the results. We have already put Project Manager, Dan Heedy, in touch with this local company that treats whole structures with heat. Precision Environmental, Inc. is has been in business for over 20 years, carries the appropriate insurance required by the University and their happy clients include- Stanford University, UCLA, SBCC, Cal Poly, National Park Service, US Navy, Santa Barbara County, Lockheed Martin, Hewlett Packard, Unified schools districts of San Francisco, Ventura and Ojai and the Santa Barbara Elementary School District. Many of these buildings were residential. They are reputed to have matched or beat the price of their competitors for past clients, like the Ventura Unified School District. Although not all houses can be treated by heat for different reasons, the contractors from Precision have surveyed our buildings at Storke I and find them a suitable candidate for the heat method.

### **Some Features of the Heating Method**

- 1 No chemicals are used.
- 2 No offgassing or residue.
- 3 It is an 8-hour process with no overnight stay and packing for a large family for a week.
- 4 It also kills mold, spores, dust mites, and other air allergens. Great for Stroke! Storke complexes have been plagued by the feeling of "sick building" syndrome for years. Our Mold Survey of the complexes completed in June, 2005 is proof of an ongoing tremendous burden that is faced each day by our residents. Mold is affecting the health of the residents and their children in a variety of ways.
- 5 Heat will rid the apartments of the dryrot that has currently put over 21 apartments offline. When the apartments are online again they can again bring in the income from the rent.
- 6 It kills the termite eggs and termite pheromones and dries out the dampness in the wood making it less feasible for the termites to return, a great preventative tool.
- 7 It comes with the same warranty as the chemical fumigation.

### **Drawbacks**

Housing talks about three possible drawbacks of the Heat eradication:

1. **Labor intensive preparation of the apartment**- Preparation of the apartment for heat is not more intensive than the preparation of the apartment for the vikane fumigation. It is different, though. Small articles such as- tupperware, cds, wax candles, lipsticks, chocolate will need to be removed or put in the refrigerator. The resident may choose to put away some electronic equipment or those items can be protected with thermal blankets. The items that needed to be removed for the vikane fumigation were food, shampoos, toothpaste, medicine, makeup, furniture upholstered in plastic like the mattresses. The fact that vikane is 3.52% heavier than

air and penetrates all surfaces provoked many residents who were affected by the imminent fumigation to pack up majority of their household items to safeguard their health and the health of their children. Some residents had even decided to rent a uhaul for taking out everything in their house. Many residents had planned to move away from FSH for the month of August and more.

2. **Heat costs more-** We have talked to a lot of vikane vendors who have quoted us prices that are comparable to the (higher) heat prices. They are infact surprised that the company fumigating for Housing is charging them prices that are even below the wholesale prices. Vendors have told us that at that price they can only supply the toxin and will not be able to cover the cost of tenting and labor. We expect the University to bargain for the lowest prices possible on our behalf but the low cost of the fumigation, at least the cost that we were told by Housing, concerns us very much. Is the cost being cut in monitering the toxin or airing it out? We asked Housing this question first week of August and they have not provided us with an answer as of yet. Both the heating and the fumigation companies carry extensive insurance to be able to work with large clients like the University. This insurance covers all liable costs. Fumigation can cause damage to the structure too- damage to roofs and eves is most common. There have been times when huge holes in the roof broke open.

3. **Heat does not kill all termites-** Although heat was used for pest eradication for a long time, termite heat eradication was approved by the State of California for structural use only after five years of extensive study called "Villa Termiti", ordered by the California Structural Pest Control and conducted by UC Berkley. At the end of the study it was concluded that "The heating process provided an effective non-chemical alternative to conventional pest control." William Curry, Director of the International Pest Management Institute and former scientist for the EPA has found termite heat treatment to be "perfectly safe for our properties and environment and throughly effective." The experts agree on heat as a effective and only non- chemical method to successfully treat entire structures.

However, if one employs Hydrex as the expert on heating method things will not look favorable for the thermal method. Companies like Hydrex might offer heat as an alternative but don't have the proper equipment, experience or even insurance to treat entire structures such as ours. Environmental Precision is dedicated to heat only just as Hydrex is dedicated to Vikane. Vikane is the biggest seller for the conventional pest eradication companies and their entire business is geared towards it. It is true that the heat method has failed in some cases but so has Vikane. If the process is not followed properly both methods can bring poor results. Surely, the failure on one vendor to properly perform the application cannot be held against the entire industry. If such is the case, if one failure should speak to the whole industry then one can also keep in mind the couple who died in Virginia after re-entering their house that was fumigated with Vikane (cdc.gov) and the miscarraige suffered by a woman in Florida the night after her neighbors fumigated with Vikane (getipm.com) and death of an healthy 39 year old adult whose neighbors were fumigating with Vikane (panna.org). These are exactly the scenarios that concern us- re- entry risks, risks to unborn

children and risk to our healthy adults. On the other hand, heat has no side effects on health whatsoever.

## **Conclusion**

Many residents were relieved and very happy when the Vikane fumigation was finally stopped. They have thanked us from the bottom of their hearts and are glad that we helped them in their hour of need. We also thank them for speaking out and standing up for themselves and our community.

We still face issues that will affect our future here at FSH. If heating is not adopted by Housing for termite eradication, they will come back to fumigate again in a few years and the residents will face all the exposure risks. If Vikane is the only method Housing is willing to use, it is better to do no more than one building per year so that the community does not face the risks of the intermediate exposure. Our hope for the future is that the Housing and Residential Services will follow the lead and example of the city we live in, the University we belong to and adopt an Integrated Pest Management policy and start using alternatives that are not only safe but today they are also effective and affordable. UCSB is already recognized in the community as a "green university" but we are told that the Housing and Residential Services operate separately from the University. Why should Housing and Residential Services expose us, the family student housing, to extremely toxic archaic technologies and products when the University has an excellent IPM policy?