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M E M O R A N D U M

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SUBJECT: FUMIGATION PLANNING RECOMMENDATIONS FOR THE FOSTER FARMS LIVINGSTON CALIFORNIA PRODUCTION FACILITY

On February 13, 2019, Senior Industrial Hygienist Harvard R. Fong and Associate Industrial Hygienist Emma R. Wilson from the Department of Pesticide Regulation (DPR) Worker Health and Safety Branch toured the Foster Farms production facility in Livingston, California to evaluate the site of a proposed Vikane fumigation. Also present were Louie Guerra and Alfonso Garcia from DPR Enforcement Branch's Central Regional Office and Jon Chapman, Carrie Mitchell, Cari Gansberger, and Cameron Stevens from Merced County. The tour was led by Bobbie Orr and Derick McNally from Western Exterminator Company.

The Foster Farms facility consists of two main buildings attached with a walkway (Figure 1). The main production area (red outline) is approximately 250,000 square feet and contains the proposed fumigation area (yellow shading), which is approximately 28,000 square feet. Processes in these sites include meat preparation, packaging, offal processing, and many other activities. The second major building is the shipping warehouse (green outline), which is approximately 200,000 square feet. The walkway connecting the structures (blue outline) is about 300 feet long.

According to the Vikane label, a connected structure is "*any structure connected with the structure to be fumigated by construction elements (e.g., pipes, conduits, ducts, etc.) which may allow passage of fumigant between the structures. If state rules and regulations do not describe or permit a process to isolate and seal a connected structure to prevent passage of fumigant from the fumigated structure, then the connected structure must be vacated during the fumigation*."

Due to the size and complexity of the structure and the isolated location of the pest pressure, the Vikane label method of "Tape and Seal" is proposed for the fumigation area. This method is recommended by the label for certain types of construction such as concrete and metal, as found in

the Fosters Farms facility. However, as also noted on the Vikane label, fumigant can penetrate and permeate through the building walls and roof, even with proper sealing when using the "Tape and Seal" method. DPR recommends that chloropicrin be used as a warning agent for the proposed fumigation. This is especially important if there are any workers in the shipping warehouse at any time during the fumigation.

Sulfuryl fluoride has a vapor pressure of 15.8 atm (12,008 mm Hg), meaning it is capable of rapid diffusion throughout structures. While this feature makes it an effective fumigant, it also presents a high potential for migration away from the treatment area and possibly to the workers' location. If 1ppm sulfuryl fluoride is detected in the shipping warehouse, an emergency evacuation plan must be implemented for workers that may be present.

The safest practice is to remove all Foster Farms workers from all potentially connected buildings. In either case, no workers should be present anywhere in or on the production facility during fumigation and aeration.

Containment

The Vikane manual describes specific materials and methods required for a "Tape and Seal" fumigation. The fumigation area contains grates in the flooring that may be difficult to seal (Figure 2). There are metal doors at the ends of the grates that should be closed during fumigation to help with retention. All label methods must be followed for sealing the treatment area, and if possible, the room's floor drainage system should be flooded with water to create a water seal, which is impenetrable to sulfuryl fluoride.

All roof openings and accesses on the production side of the facility must also be closed and sealed according to label directions during fumigation. This includes fans or other air movers on the roof, and louvers, as part of the heating, ventilation, and air conditioning (HVAC) system. If the shipping warehouse (Figure 1) remains operational, the HVAC system for that building may stay in operation. However, any portion of the production HVAC system that connects to other parts of the facility must be shut down and locked out during fumigation.

Plumbing, electrical, or any other conduits or pipes that connect the treatment area to the rest of the building must also be sealed to ensure the fumigant does not migrate through these pathways.

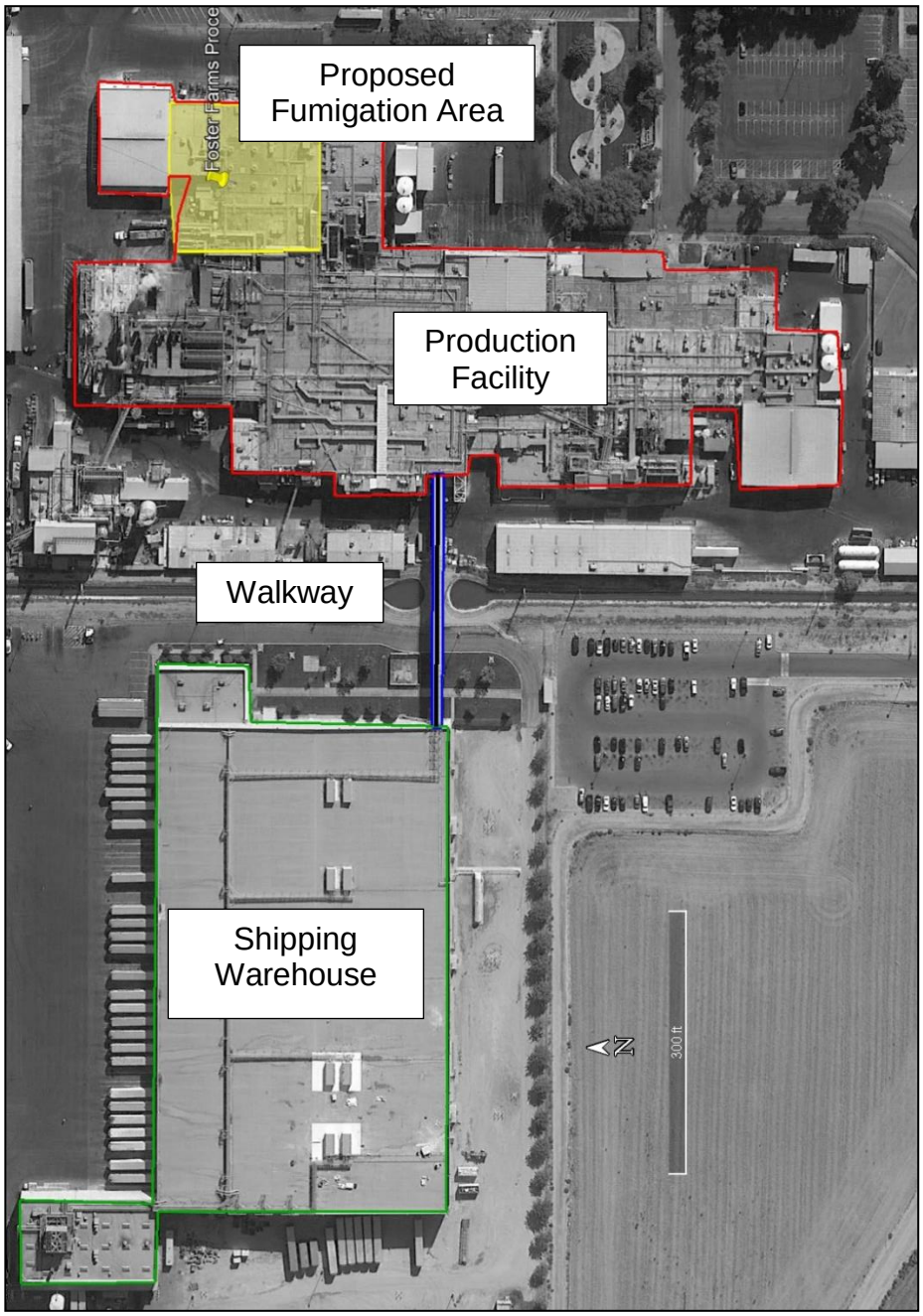

Figure 1. Map of Foster Farms production plant in Livingston, CA. Green outline indicates shipping warehouse. Red outline indicates the production section. Blue outline shows the connecting walkway between the two sections. Area shaded in yellow was the site for potential fumigation at the time of the visit.

Figure 2. Floor gratings over drain system (left) provide a unique challenge to retaining the fumigant. One measure that could help is closing the door (right) to prevent gas movement out of the room.

Monitoring

As specified on the label, "Tape and Seal" fumigations may have lower Half Loss Times and require monitoring with a Fumiscope, or other approved device, to ensure efficacy. These monitors have limits of detection of one ounce per thousand cubic feet (1 oz./1000 ft^3), or about 240 ppm sulfuryl fluoride. Although adequate to ensure efficacy, they are not to be used to assess worker safety.

Worker monitoring must be done with a label approved clearance device (Interscan, ExplorIR, MIRAN, etc.). These monitors can detect down to 1 ppm (the allowable concentration listed on the Vikane label), and should be located within the shipping area at breathing zone height (approximately 1.5 meters from floor), and in areas where workers may be present. A monitor should also be placed at the shipping entrance to the walkway. Any time workers are present, a licensee dedicated to observing and recording monitor readouts must also be present. An evacuation plan must be in place and followed immediately if sulfuryl fluoride is detected in the shipping warehouse.

No handler should be in or on the production facility unless using an appropriate monitoring device that indicates concentrations of 1 ppm or less, or wearing appropriate respiratory protection. In addition, a monitoring device should be located outside the production facility with its hose running into the structure to monitor the sulfuryl fluoride levels in the un-fumigated portion of the structure. This should be done in addition to the clearance activities listed on the label to ensure worker safety upon reentry.

During clearance, all areas of the production facility, and not just the fumigated area, should be tested for sulfuryl fluoride. Special attention should be given to any pits, enclosed areas, or below-grade areas.

Walkway

The walkway connecting the production to the shipping section of the facility will be difficult to completely seal. Figure 3 shows the end of the walkway next to the production facility and the conveyor belt that runs along the length of the walkway. Consultation with an engineer is strongly recommended to determine if any structural changes could be made to the walkway to improve sealing. If no physical separation of the walkway from the production facility is feasible, the conveyor belt should be disassembled and sealed at both ends of the walkway that connect to the two structures. Electrical conduits that connect the two structures should be sealed or blanked to prevent fumigation movement.

Additionally, it is recommended that fumigation fans be used to push and pull the air across the walkway where doors are located (Figure 3). One fan should be located at the exterior-communicating door closest to the shipping side of the tunnel, and be positioned to blow exterior air into the tunnel, perpendicular to the long axis of the tunnel. A second fan, located at the exterior-communicating door closest to production, should be positioned to blow air out of the tunnel. This will create an air wall (barrier) that will reduce the potential for sulfuryl fluoride to migrate towards the shipping side of the walkway.

Figure 3. Walkway end on production-side of the facility (left). Exterior of walkway (right) with yellow arrows indicating the recommended location of the fans.

Emergency Planning
Before fumigation begins, an evacuation and medical plan must be in place. In case of a catastrophic emergency (e.g., Vikane tank leak), local emergency personnel must be notified of the fumigation before it occurs.

Modeling
Due to the large space expected to be fumigated, it is recommended that the facility coordinate with DPR's Environmental Monitoring Branch, Air Monitoring Program for any non-occupational bystander exposure prior to any fumigation activities.

The recommendations addressed in this memorandum pertain only to the proposed fumigation area as shown on Figure 1 (yellow shaded area). If any other part of the facility requires fumigation, additional consultation will be required. Recommendations are meant to mitigate the potential risk to workers only, not for the protection of any food or feed products that are in the facility's structures (currently there are no set tolerance levels for sulfuryl fluoride on poultry or poultry products). All recommendations herein are pursuant to Title 3 of the California Code of Regulations (CCR), section 6780, and Title 8 CCR Section 5223.

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