
Date February 11, 2025
To Sunflower Redevelopment, LLC
From Dr. Kanan Patel Coleman, DEnv, MPH
Subject Kansas House Bill No. 2340

Good afternoon, Mr. Chairman and members of the Committee. My name is Dr. Kanan Patel-Coleman. I hold an undergraduate degree in medical biology, a master's in public health, and a doctorate in environmental science and engineering, specializing in environmental health risk assessment. I am the National Risk Assessment Practice Leader for Burns & McDonnell Engineering Company, leading an expert team of risk assessors. I have more than 20 years of experience in performing human health risk assessments related to chemical release exposures on over 400 projects with industrial facilities, commercial enterprises, military installations, government clients, educational campuses, and others.

For the pesticide applications at the former Sunflower Army Ammunition Plant (Sunflower), I have studied the available soil data and was the technical lead in preparing the *Human Health Risk Assessment for Management of Pesticide-Impacted Soil* for commercial/industrial land use and construction activity at the Sunflower and the subsequent *Addendum* and *Revised Addendum* for residential land use. These documents were submitted by Sunflower Redevelopment, LLC (SRL) to the Kansas Department of Health and Environment (KDHE) on November 28, 2022, January 17, 2023, and April 18, 2023, respectively. This brief discusses the findings and conclusions of these risk assessments related to the human health risks posed by exposure to residues from the US Army's historical pesticide (termiticide) application at Sunflower to routinely control termites at occupied buildings.

The risk assessments focused on 10 acres at Sunflower exhibiting the most highly concentrated area of pesticide applications. The area selected was intentionally a "worst case" scenario for the risk of encountering pesticides from 25 existing structures in this 10-acre area, or 2.5 structures per acre. No other 10-acre area on Sunflower had this density of buildings with historical pesticide application. There are a total of 530 remaining structures with historical pesticide application over the approximately 6,000 acres to be developed by SRL, or less than 1/10 structures per acre. This means that the study was very conservative in its approach and tried to capture the highest concentration of pesticides in soil located at Sunflower. As part of the risk assessment, 2,016 soil samples were collected from three depth intervals across the 10 acres and analyzed for the four historically applied pesticides (aldrin, chlordane, dieldrin, and heptachlor).

When human health risks are calculated for exposures to chemical releases in the environment, two types of health effects are evaluated: noncancer hazards that affect organs or organ systems (like the bladder or nervous system) and cancer risk. The acceptable noncancer hazard level (or index) is less than or equal to 1 as determined by KDHE, which follows the United States Environmental Protection Agency (USEPA) standard. The KDHE acceptable cancer risk is less than or equal to 0.1 in 10,000. The USEPA acceptable cancer risk is less than or equal to 1 in 10,000.

The results of the risk assessment showed that the noncancer hazard index and cancer risk were acceptable for commercial/industrial or construction worker populations at the site. As to residential use, the noncancer hazard index was acceptable; the cancer risk was greater than the KDHE acceptable level but less than the USEPA acceptable cancer risk level. For context, consider that:

- The lifetime cancer risk in the United States is 3,930 per 10,000 people

- The lifetime risk of being in a drunk driving accident is 3,000 per 10,000 people
- The lifetime risk of unintentionally dying from a preventable injury is 500 per 10,000 people
- The lifetime risk of being in a motor vehicle accident is 100 per 10,000 people
- The lifetime risk of a non-fatal bathroom injury is 1 per 10,000 people 15 years or older

The USEPA cancer risk threshold of 1 extra cancer case per 10,000 people from exposure to site chemicals released in the environment is still quite small compared to cancer risks from all other sources and compared to other risks in daily life.

There is also a pragmatic factor that occurs during site development that will further reduce the risks of exposure that our calculations were not able to capture. As typical during ordinary site development, area-wide soil disturbances and excavations will occur. Site development will involve removing topsoil; general grading to balance site topography; installing drainage, water, sewer, and power lines; constructing road infrastructure and hardscapes; and/or placing additional topsoil for landscaping or grass. These activities will redistribute pesticides in the soil, thereby lowering concentrated exposure risk and making it even safer for human health than the risk assessments found.

Finally, the same termite control chemicals that were used at Sunflower were widely used on residential houses throughout Kansas that are not being cleaned up. The risks associated with residual pesticides at Sunflower would not be expected to be any different because they would have been applied the same way as for homes. And, as the risk assessments demonstrate, the noncancer human health risks are within acceptable levels for KDHE and USEPA and the cancer risks are within acceptable levels for USEPA.