

Commissioner Pigott Responds to Residents' Concerns

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On October 12, 2019, Dr. Sherrie Steiner and students in her Social Theory course presented the findings and analysis of the second moss study to a community meeting in Hartford City, IN. Local residents, a small group from North Manchester High School, some activists in Muncie and candidates for the upcoming mayoral race gathered at *The Pickle* to learn whether or not the air was continuing to be contaminated near Hartford Iron and Metal (HI&M) since they had begun implementing a quarterly fugitive dust remediation program.

The first study, conducted in 2016, had used moss as a bioindicator for air pollution. Dr. Steiner and her students had worked with residents to gather moss from trees in the neighborhood surrounding HI&M to compare it to moss gathered from a nearby park. Findings for all heavy metals were significantly elevated. HI&M responded by implementing a quarterly dust program. A weakness of the first study was that the timeframe of exposure could only be estimated and contamination from normal community activities (e.g.,



Picture 1. Henry Epling, intern, with Dr. Steiner checking the moss in the Dept. of Biology greenhouse.

household lead paint, driving cars) could not be separated from contamination from the activities of how HI&M was processing steel (e.g., car crushing, torching of metal). Dr. Steiner partnered with Dr. Marshall to conduct a second moss study that would establish a known timeframe of moss exposure to the air. The control was changed from the park to a similar neighborhood across town to control for normal neighborhood activities. Moss was grown in the Department of Biology greenhouse and tested for heavy metals (See Picture 1). Lab tests indicated that the moss was free of any heavy metal contamination. Dr. Steiner's intern, Henry Epling, helped Eric Evans, president of Blackford County Concerned Citizens, build nine moss stations to place in the community (See Picture



Picture 2. Henry Epling, intern, building a moss station with Eric Evans, President of Blackford County Concerned Citizens.

2). The moss was then placed in the stations that were located around HI&M and in a control station (See Figure 1). Residents were asked to monitor and nurture the moss in each station.

Residents were also given journals and asked to make daily notations of any unusual activities or occurrences associated with either the moss station or HI&M. We initially recruited residents for what we anticipated would be a three month project but weather impacted moss growth, so the project was extended to twelve months. Residents took excellent care of the moss and showed significant

commitment to the community project throughout the duration of the moss placement despite the unexpected increase in time commitment. The moss was exposed to the air for a year.

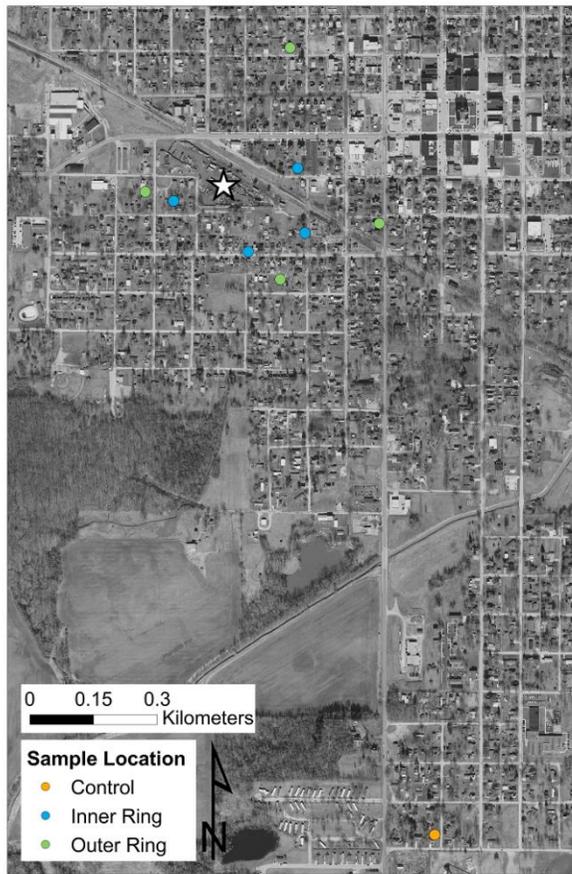


Figure 1. Locations of eight stations adjacent to a steel recycling plant and a control station.

The blocks adjacent to HI&M were greater than the control for each heavy metal indicating that the elevated levels that students would graph to present to the community were statistically meaningful.

Students in Dr. Steiner’s Social Theory course created posters during Fall 2019 that displayed the results in ways that could be easily communicated to, and understood by, the local residents. Students were asked to present the data for each heavy metal that was tested and provide information about the health effects of airborne exposure to the heavy metal as well as provide information about what residents could do to reduce toxic exposure. Poster drafts were reviewed by Dr. Indra Frank, MD, MPH, who serves as the Director of Environmental Health and Water Policy for Hoosier Environmental Council. After

At the end of the exposure period, Dr. Steiner and Eric Evans, President of Blackford County Concerned Citizens, collected the journals from residents, gathered the moss and sent the moss for laboratory analysis. Dr. Steiner went through the collection of journals and residents documented at least 28 explosions (See Table 1). All samples contained contamination exceeding the detectable limits and the moss samples surrounding HI&M had higher levels of each heavy metal than the amount found in the control. Dr. Jordan Marshall analyzed the results as blocks adjacent to

Table 1. Dates, times, and counts of explosions noted by participating residents adjacent to Hartford Iron & Metal. Asterisk (*) indicate record of explosions without recorded counts.

Date	Time	Explosions Count
15 July 2018	9:55 am	*
15 July 2018	8:55 pm	2
31 July 2018	3:35 pm	2
01 August 2018	9:00 am	*
02 August 2018	8:36 am	4
02 August 2018	9:45 am	3
03 August 2018	7:10 am	*
27 August 2018	4:20 pm	*
30 August 2018	12:30 pm	2
30 August 2018	12:45 pm	*
05 September 2018	8:15 am	*
24 April 2019	Afternoon	*
03 May 2019	Morning	*
03 May 2019	Evening	*
06 May 2019	Morning	6

HI&M compared to the control with an ANOVA (See Figure 2).

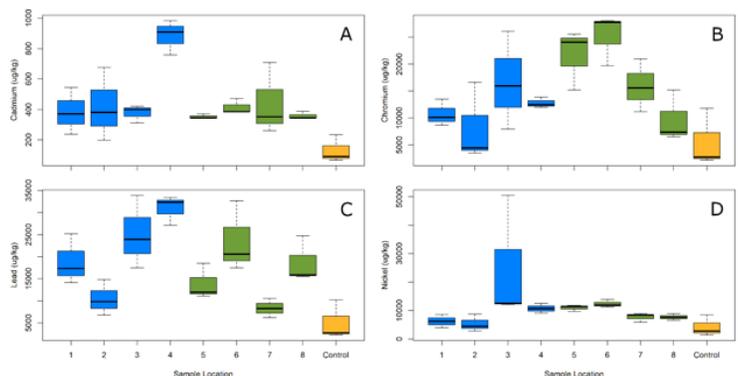


Figure 2. Between station comparisons of cadmium (A), chromium (B), lead (C), and nickel (D). Blue locations = inner ring (Fig. 1); Green locations = outer ring (Fig. 1); Orange locations = control (Fig 1).

explained to residents that research indicates that steel recycling plants that use processing methods involving fire (e.g., torches, explosions) have been shown to produce airborne hexavalent chromium which is highly carcinogenic. The moss method is unable to determine the form the chromium is taking and the machines needed to make that determination are beyond the resources available to most universities. Given that airborne exposure represents a direct avenue of contamination, these findings were of high concern and further research is warranted.



Picture 3. The community gathers at *The Pickle* on October 12, 2019 in response to moss study #2.

Eric Evans, President of Blackford County Concerned Citizens, communicated to the community that the Department of Homeland Security and the Indiana Department of Environmental Management (IDEM) are two

state agencies that have the resources to test the air for hexavalent chromium. Several of the residents wrote the Governor Holcomb and Commissioner Pigott to express their concerns and ask for immediate testing for airborne hexavalent chromium (See Picture 4).



Picture 4. Residents ask Governor Holcomb and Commissioner Pigott to test the air for hexavalent chromium.

In early December, Commissioner Pigott responded positively to resident’s concerns. Plans are already underway for installation of the equipment needed to conduct further testing in Spring. Commissioner Piggot’s response represents an important step forward in resident’s efforts to have their concerns recognized and addressed by government agencies. If hexavalent chromium is found to be present in the air surrounding Hartford Iron and Metal,

this evidence would suggest that the processing methods associated with the way the company conducts its ongoing business operations is problematic for ongoing location in a residential community.