Introductory Remarks

We understand that the situation at Poe Hall has been challenging and stressful for all involved, and that many employees have concern for their health; the health of their friends, family and coworkers; and the health of the broader university community. We appreciate the time that management and employees took to review NIOSH's health hazard evaluation (HHE) report. We also appreciate the time employees took to submit questions.

The following responses are intended to address your questions as clearly as we can, based on the findings of the evaluation presented in the NIOSH report: Evaluation of Exposure to Polychlorinated Biphenyls (PCBs) and Cancer Concerns Among University Employees). The questions and responses should be considered in the context of the full report.

If any employee would like to talk with us further, please contact the HHE Program at HHERequestHelp@cdc.gov or 513-841-4488. We will continue to answer questions to the best of our ability.

The following are questions submitted by NCSU employees in the Department of Psychology and College of Education and provided to NIOSH by employee representatives. Questions appear in bold and draft responses prepared by the NIOSH team appear in regular font.

1. **I have cancer. How do I know that I am in the data you presented?**

   Your cancer diagnosis should be included in the data presented if both of the following apply to you:

   (1) You were a North Carolina State University employee with a workspace in Poe Hall at any time during 1995–2022.
   (2) You were living in North Carolina when you were diagnosed with cancer during 1995–2022.

   If both of those things are true, your diagnosis met the eligibility requirements of the analysis and was likely captured through the North Carolina Central Cancer Registry, which is the source we used to identify cancer cases for this evaluation.

2. **The WRAL independent report tested offices. The NIOSH report does not report PCB at the office level so the exposure is very inexact. Why didn't you link cancer victims to their offices? Why is there a lack of specificity in the NIOSH report?**

   As part of the HHE, we reviewed reports prepared by NCSU staff and their consultant describing environmental assessments and air, surface, and bulk building material sampling conducted for PCBs from April 2018–April 2024. The reports we reviewed included information about where in the building samples were collected.

   In the front portion of our NIOSH report, we provide broad observations based on all of the sampling results. We also provide more detailed information including specific rooms when discussing results in the Supporting Technical Information section of the report.

   Although ideally we would like to be able to understand and estimate individual-level PCB exposure, linking individual people to specific offices or rooms was not possible with the data available, for two reasons:

   First, the university records available were not detailed enough to reliably assign specific individuals to specific rooms for the time they worked at the university. The records only told us if a person was ever assigned to a workspace in Poe Hall. They

did not tell us the specific room the person was assigned, and the system was not necessarily updated if a person's assigned room changed.

Second, an individual's assigned work location alone would not fully describe their potential exposure. This is because we assume that most employees would move between spaces such as classrooms, hallways, bathrooms, laboratories, and breakrooms. In addition, activities such as eating or drinking and the number of hours spent in spaces would also likely vary by person and play an important role in estimating individual-level exposure.

The goal of this evaluation and report was to determine whether PCBs were present in the building, especially in air and on surfaces in spaces where people spent their time, at levels known or suspected of causing cancer. This evaluation was not designed to estimate employee exposures to PCBs, which we recognize may be frustrating especially for employees who are trying to understand their personal risk.

The recommended feasibility assessment should consider what data are available to build upon the findings in the NIOSH report, including whether additional data exist, or could be gathered, to develop better group or individual exposure estimates.

3. **The report states "Tests exist to measure PCB levels in blood, body fat, and breast milk. However, the tests cannot determine when or how long persons were exposed or whether they will develop health effects." I understand this is true if the tests show PCBs. If someone does a test and no PCBs are detected, are the tests good enough to mean the person wasn't exposed?**

   Blood tests can detect PCB levels in the body, but a result showing no elevated PCBs does not necessarily mean you were never exposed.

   Most people have low levels of PCBs in their body because nearly everyone has been exposed to PCBs that persist in the environment. Different kinds of PCBs remain in blood for varying amounts of time ranging from as little as 1 year to more than 20 years. Because of this, a blood test taken today may not reflect PCB exposure that occurred years ago.

   A blood test can show if your PCB levels are higher than levels in the general population, which would suggest past exposure to above-normal levels of PCBs.

However, if your blood test results are similar to those of the general population, that alone cannot confirm you were not exposed to higher levels of PCBs in the past. Importantly, these tests also cannot determine when or how long you were exposed, where the exposure occurred, or whether you will develop health effects.

Because interpreting PCB blood test results can be complicated, test results should be reviewed and carefully interpreted by physicians with a background in environmental and occupational medicine.

Sources:
Polychlorinated Biphenyls (PCBs) | ToxFAQs™ | ATSDR
Polychlorinated Biphenyls (PCBs) | Public Health Statement | ATSDR
Public Health Implications of Exposure to Polychlorinated Biphenyls (PCBs)

4. **What are the names and ways to get the PCB level tests?**

PCB testing is typically ordered by a healthcare provider and processed by a laboratory. Tests exist that can measure PCB levels in blood, body fat, and breast milk. If you are interested in being tested for PCBs, we recommend you speak with your healthcare provider, or a healthcare provider with a background in environmental and occupational medicine to request testing and discuss your results.

You can find an occupational medicine healthcare provider in your area through a variety of sources, including the Association of Occupational and Environmental Clinics and the American College of Occupational and Environmental Medicine.

5. **The median length of employment was quite low (2 years). When all of the short-term employees are not considered, what is the rate of cancer occurrence?**

Unfortunately, we were unable to perform that specific analysis as part of this evaluation for two reasons:

First, excluding short-term employees would have greatly reduced the number of people and cancer cases in the analysis. With fewer people, statistical analyses of

cancer rates would be less precise and reliable, which may have made it harder to draw conclusions about cancer rates.

Second, to protect privacy of medical information, we received only aggregate case counts from the cancer registry. We did not receive individual-level data. This prevented us from comparing rates across additional groups.

We understand some of the limitations of this analysis leave meaningful questions unanswered. A specially designed epidemiologic study could address questions about how cancer rates vary by duration of employment and estimated levels of exposure. The recommended feasibility assessment can determine if the data needed to address those questions exist or could be gathered.

6. **Is there a relationship between person time in the building and cancer occurrence? I see it was considered but it is not clear what the relationship was. It looks like it was only considered for excluding people who developed cancer "too fast" after being hired.**

   We did not evaluate the relationship between time in the building and the occurrence of cancer as part of this analysis. The closest measure for time spent in the building available to us was duration of employment at the University, which we used to understand the timing of cancer diagnoses relative to work in the building.

   We were unable to go further with this analysis for three reasons:

   First, in the university setting, employment duration may be a poor proxy for the amount of time spent in a specific building, making results difficult to interpret meaningfully.

   Second, the number of cancer cases of each type was relatively small, limiting our ability to analyze additional sub-groups.

   Third, to protect privacy, we received only aggregate case counts from the cancer registry rather than individual-level data. This prevented us from comparing rates across additional groups.

   We understand some of the limitations of this analysis leave meaningful questions unanswered. A specially designed epidemiologic study could address questions

about how cancer rates vary by duration of employment. The recommended feasibility assessment can determine if the data needed to answer those questions exist or could be gathered.

7. **Testing in October 2023 (before closing Poe Hall) showed very high levels of PCBs in some areas. "Testing in October showed bulk samples taken in the fifth floor women's bathroom were 38 times EPA limits, and other bulk samples tested high for PCBs." (from WRAL). NC State's independent analysis showed much lower levels. Why?**

   PCBs were present in bulk building materials (for example, insulation sealants, lined duct insulation facing, window caulk) sampled by NCSU staff or their consultants. In samples taken in October 2023, Aroclor-1262 was detected in bulk building material samples such as insulation facing, insulation sealant, insulation fibers (range: 52–1,900 mg/kg). These concentrations exceeded the Toxic Substances Control Act (TSCA) PCB Bulk Product Waste criterion of 50 mg/kg. The sample with the highest level (1,900 mg/kg) was approximately 38 times the TSCA PCB Bulk Product Waste criterion. Additional sampling of bulk materials conducted in January and March 2024 found concentrations of PCBs ranging from 0.91– 53,000 mg/kg, with most samples exceeding the TSCA PCB Bulk Product Waste criterion of 50 mg/kg. These findings are described in the Supporting Technical Information section of the report (pages B2–B4).

   It is important to understand that bulk material samples and air or surface samples measure different things and are not directly comparable. The concentration of PCBs in building materials identifies potential PCB sources and dictates disposal requirements but does not by itself indicate the level of exposure experienced by building occupants. Once PCBs are released from materials, occupants can be exposed through inhalation or contact with contaminated surfaces. Air and surface sampling more accurately reflects actual exposure levels for people spending time in the building.

   Without knowing which specific results are being referred to as NC State's independent analysis, we are unable to directly address that comparison. What we can say is that all air samples collected were below EPA reference levels (Exposure Levels for Evaluating PCBs in Indoor School Air for adults, 0.5 micrograms per cubic meter of air) and two surface samples exceeded EPA reference levels (threshold for PCBs on non-porous surfaces, 10 micrograms per 100 square centimeters). The

university's consultants did find bulk samples above the TSCA PCB Bulk Product Waste criterion of 50 mg/kg), but those findings are not a direct indication of exposure intensity for building occupants.

If you are able to share the specific results you are referencing, we can try to clarify the difference.

8. **I disagree with the report that years of employment is such a poor proxy that the relationship between years employment and cancer rate should not even be estimated. Median employment duration of 2 years is exceptionally short but surely there was a sample of employees that spent more than 5 years in the building. Simply comparing those two groups would at least be some indication of the effects of longer-term exposure even if imperfect.**

   We appreciate this feedback and understand the reasoning. To clarify, we did not mean to imply that years of employment should not be assessed as a proxy for exposure in future work. We only meant to explain that it was not feasible within the scope of this evaluation, which had a goal to determine whether an excess or unusual pattern of cancer had occurred among employees.

   We were unable to evaluate the association between employment duration and cancer for three reasons:

   First, in a university setting, employment duration can be a misleading proxy for time spent in the building. For example, a student worker may have been formally employed for a short period but spent considerably more time in the building than a faculty member during that period.

   Second, the number of cases of each cancer type was relatively small, limiting our ability to reliably analyze subgroups.

   Third, to protect privacy, we received only aggregate case counts from the cancer registry rather than individual-level data, which would be necessary to compare rates between groups such as those employed for ≤5 years versus >5 years.

   We understand that some of the limitations of this analysis leave meaningful questions unanswered. How best to evaluate the relationship between potential PCB exposure and cancer occurrence, potentially including analyses by duration of

employment, is exactly the kind of question that could be addressed in a specially designed epidemiologic study if a feasibility assessment determines it would be beneficial and possible.

9. **What are the implications of using the EPA standard for "indoor school air" versus an office building? In school/educational settings, students and teachers are in the spaces for less time than an office building and the spaces in educational settings are physically larger (not individual offices). Faculty, staff, and graduate students spent time in the building as an office building.**

   The EPA Exposure Levels for Evaluating PCBs in Indoor School Air were based on calculations where the EPA assumed that adults were in school for 8 hours per day, 185 days per year. This would be equivalent to 37 five-day work weeks, or slightly over 9 months. It is not clear that the size of the space would contribute to the exposure levels since they are expressed in units of nanograms per cubic meter of air.

   We used the EPA exposure levels as a reference for this evaluation because they are the most applicable standard available for an academic building. EPA does not have alternative guidelines for evaluating PCBs in office buildings. We recognize that the underlying assumptions of the school air standard may not precisely reflect the experience of all employees who worked in Poe Hall, as some may have spent more or less time in the building. This is an important consideration in interpreting the results of this evaluation.

10. **What should we tell our medical doctors? How should we advocate for ourselves? And how could we get any additional tests covered by our insurance? What documentation can we provide to demonstrate the medical necessity for screening or additional tests so that insurance covers it?**

    We understand how important it is to advocate effectively for your health. Employees can share a copy of this report with their healthcare provider to provide meaningful context for discussions about health concerns.

    Regarding insurance coverage, we are unable to provide advice on navigating that process. However, documentation such as this report, combined with a physician's written assessment of medical necessity for specific tests, may be useful in supporting coverage requests. We encourage you to discuss this directly with your healthcare provider and, if needed, your insurance carrier.

11. **Is there a plan to distribute the HHE to alumni (graduate and undergraduate students) and former employees?**

    The HHE report is publicly available and we encourage it to be shared widely. NCSU posted the report at NIOSH completes its HHE related to Poe Hall | Poe Hall Updates. The report is also published on the NIOSH HHE Program webpage and as a direct download here. Anyone, including former employees, graduate and undergraduate alumni, and their families, can access and share the report using these links.

    Decisions about actively reaching out to former employees and alumni to distribute the report are within NCSU's purview. We encourage you to direct that question to university leadership.

12. **Did you use the right latency period? You used 4 years for melanoma/breast cancer, but the report says some studies suggest 10–20+ years. If latency is longer, are you missing connections?**

    We selected a 4-year latency assumption for melanoma and breast cancer to be as inclusive as possible. This assumption was based on a review of the available literature for different groups of cancers conducted by the NIOSH World Trade Center Health Program.

    We recognize that some studies suggest latency periods of 10 years or more for certain cancers, and we discuss this in the Supporting Technical Information of the report. Applying a longer latency assumption would have reduced the number of cases, and the number of person-years included in the analysis, which would have further reduced precision. We opted for the bias that may arise from including a few more cases than for the bias that may arise if our latency assumptions were too stringent. Using different latency assumptions could result in alternative findings and conclusions.

    That said, we understand the concern that a longer latency period could reveal either a larger excess of cancers or no excess of cancers among employees. The effect of different latency assumptions on cancer rates is exactly the kind of question that a specially designed epidemiologic study could systematically evaluate if a feasibility assessment indicates that would be beneficial.

13. **Should I be monitored long-term? What about my child, with whom I was pregnant, in the building? The report does not outline a clear follow-up program. Who is responsible for tracking future health outcomes?**

    We understand the concern behind this question. While we are not able to provide recommendations for individual-level medical care, we encourage you to discuss your specific situation with your and your family's healthcare providers. Sharing the NIOSH report with your provider may help give them important context for evaluating your health history and that of your child.

    Regarding long-term monitoring and tracking of future health outcomes, those are decisions that could be discussed during a feasibility assessment and would be part of planning any future epidemiologic study. We encourage you to direct questions about next steps to university leadership or your state and local health departments who are better positioned to address questions about next steps.

14. **Did you miss cases? You only counted cancers diagnosed in-state among employees (not all occupants). What about people who moved away, contractors, and students? Why couldn't you connect the occupant data to other states' cancer registries?**

    This analysis may have missed cancer cases. Our analysis only included cancer diagnoses reported to the North Carolina Central Cancer Registry. Cancer among employees who lived or moved out of state before being diagnosed, were not captured. This means the number of observed cancer cases is likely an undercount, which could bias the results, making it harder to see an excess. This is discussed as a limitation of this analysis in the Supporting Technical Information section of the report (page B-18).

    This analysis was limited to NCSU employees and did not include students or other building occupants. Although these are groups who may have spent considerable time in the building and whose health outcomes are understandably of concern, we were not able to include them. The NIOSH HHE Program is authorized under the Occupational Safety and Health Act of 1970, which limits its scope to workplace health and safety. Although students who were not employed by the university and other building occupants were not included in the analysis, employees are a group who likely spent the most time and had the most complete and readily available documentation indicating time spent in the building. While the findings presented here may not be generalizable to non-employees, focusing on employees allowed

us to focus on a population with well-documented potential for having spent time in the building and provides context for all people who spent time in the building.

Linking to multiple state cancer registries is possible, though it requires additional time and resources.

Expanding the analysis to include out-of-state diagnoses and broader groups of building occupants is an important step we recommend be considered during a feasibility assessment to inform the design of a future epidemiologic study.

15. **Given the small size of our college the total number of employees seems to be an overcount. I am wondering if there were university supervisors and cooperating teachers included in the count - they are never or rarely on campus. It was also noted that there was double counting - someone who was at one time a student and then later a faculty member was counted twice. I think more context is needed to arrive at a more accurate count of employees.**

We appreciate this type of insight from those with direct knowledge of the building, college, and department.

To clarify, we obtained the list of employees ever assigned to Poe Hall during 1995–2022 from the university's human resources department. The list included both the College of Education and the Department of Psychology, and employees of many types including faculty, staff, postdoctoral fellows, and graduate or undergraduate student workers. Each person was counted only once in the total (n = 4,660) and in the cancer analysis. Table C1 of the report is the only place where individuals may appear in more than one employee type category if their role changed over time. The totals are presented in this way to describe the population included but it did not affect the overall count or the analysis.

We acknowledge that being assigned a workspace in the building does not necessarily mean an individual spent significant time in the building, and that some categories of employees may rarely have been on campus. This is an important limitation and is consistent with points discussed in the Supporting Technical Information section of the report about employment records being an imperfect proxy for actual time spent in the building. Identifying or gathering additional data to better understand time spent in the building is another consideration we recommend for a feasibility assessment and any future epidemiologic study.

16. **The data was disaggregated by gender. It would be interesting to also disaggregate by employee type - staff, faculty, graduate student, undergraduate student. These differences likely reflect different amounts of time in the building. This analysis could reveal more significant differences within the employee groups.**

    We agree that disaggregating the data by employee type could provide meaningful insight, as these groups likely differ in how much time they spent in the building and in what capacity.

    We were limited in this evaluation by the small number of cancer cases, by many people moving between employee type categories during their employment, and by having access only to aggregate data from the cancer registry rather than individual-level records. These constraints prevented us from conducting more granular analyses at this time.

    A specially designed epidemiologic study could include these types of analyses if a feasibility assessment found that the necessary data were available and it would be beneficial.

17. **What other diseases and health issues will be looked into besides the specific cancers considered in the HHE?**

    Research in animals and humans has shown associations between PCB exposure and non-cancer health effects including immune system, reproductive, developmental, and endocrine effects, in addition to its classification as a human carcinogen.

    This evaluation focused specifically on cancer because this was the focus of the request. State cancer registries provide a reliable, existing system that can help us identify and count cases even when we can't contact all people who should be included in the analysis. Some non-cancer health outcomes are more difficult to evaluate systematically, as comparable public health tracking infrastructure is not as widely available and additional data collection would likely be required.

    We recognize this leaves important questions unanswered for those who may be experiencing or concerned about non-cancer health effects. A specially designed epidemiologic study could consider a broader range of health outcomes if a

feasibility assessment indicated that doing so would be both beneficial and possible.

Source: Health Effects of PCBs | US EPA

18. **Why were students and alumni not included in the cancer study? Many students and past students spent years in Poe Hall. And many of them have also been affected.**

    The NIOSH Health Hazard Evaluation Program's statutory authority is limited to evaluating workplace health hazards. For this evaluation, we defined employees as faculty, staff, and graduate or undergraduate students who were employed by the university at any point during 1995–2022. This means that students and alumni who worked for the university at any point during this time frame were included in the analysis. However, students who attended classes in the building but were not employed by the university were not included in the analysis because they were outside the NIOSH Health Hazard Evaluation Program's statutory scope and authority.

    This is a limitation of this evaluation. Potential exposure and health outcomes of students and others who spent time in Poe Hall are an important consideration, and a feasibility assessment could include an evaluation of whether students and other building occupants should be included in future work and if the data needed to do so are available or could be gathered.

19. **I worked in Poe Hall for a long time and was never approached by NIOSH about my health conditions. This would suggest many other long-term building employees and students who had health issues were also not contacted by NIOSH. Whom did NIOSH contact for this study? How many faculty and staff? How many students? Why wasn't the study more comprehensive? What further steps will be taken to ensure the full and accurate story is revealed for ourselves and our deceased colleagues?**

    We understand that many people spent many years working in Poe Hall, have concerns and health conditions to report, and may feel frustrated or left out of approaches taken to evaluate concerns so far.

    To explain how this evaluation worked: NIOSH received a request from NCSU management for a health hazard evaluation (HHE). The request concerned exposure

to PCBs and the occurrence of cancer among employees. Following standard HHE Program procedures, we spoke with both NCSU management and employee representatives to understand the situation. NIOSH did not directly contact individual employees to collect health information for this evaluation. Instead, the NIOSH team worked with the NC Department of Health and Human Services to match a comprehensive list of employees with North Carolina Central Cancer Registry records. We took this approach because it allowed us to systematically identify cancer cases during a 27-year period, including cancers that occurred among employees we could not contact, such as those who died or moved without forwarding information since they were employed at NCSU.

We understand that this methodology, while systematic, means that many personal experiences and non-cancer health conditions were not captured in this evaluation. We also acknowledge that this HHE represents only one piece of the full picture of what the community of people who worked in Poe Hall has experienced. Whether additional data collection efforts, including direct outreach to employees or others, would be feasible and beneficial is an important question for a feasibility assessment to address.

We encourage those with health conditions or experiences they wish to share to let NCSU management know they would like to understand next steps in the process.

20. Does the HHE support the understanding that there was a cluster of cases for the two diseases identified as deviating from the norm?

A cancer cluster is defined as a greater than expected number of the same or etiologically related cancer cases that occurs within a group of people in a geographic area over a defined period of time. Etiology refers to causes and risk factors associated with the development of disease. In this evaluation, we looked at the occurrence of cancers among people who shared the same workplace, even if they lived in different places.

Our findings suggest that there may be a higher number of melanoma and breast cancer cases among these employees, which aligns with some aspects of a cancer cluster. However, please note that the presence of a cancer cluster does not mean that all of the cases have the same cause. It is also important to note that while exposure to PCBs could potentially contribute to the observed cancer cases, there could be other factors at play. For example, university employees often have better

access to healthcare and regular cancer screenings than the general population, which might result in more cases being diagnosed among employees.

21. Is it a fair interpretation of your study to say that women in Poe Hall have a higher chance of getting melanoma or breast cancer?

This evaluation found that among female employees who worked in Poe Hall during 1995–2022 more melanoma, and possibly breast cancer cases were observed than expected based on women of a similar age in North Carolina. However, this finding does not necessarily mean that women who worked in Poe Hall have a higher chance of developing these cancers for the following reasons:

First, this evaluation looked backward at the observed number of cancer cases that had already occurred and compared that with the number expected to have occurred during the same period if employees experienced these cancers at the same rate as the state population. It did not assess individual or population risk of developing cancer moving forward.

Second, this evaluation was not designed to identify why female employees appeared to have experienced more melanoma and possibly breast cancer than the general population. One important consideration is that university employees often have better access to healthcare and regular cancer screenings than the general population, which can result in more cancers being diagnosed earlier, without necessarily reflecting an increase in the underlying risk of developing cancer.

22. Could further testing of the physical space in Poe Hall help determine whether a causal link exists between the building contaminants and the increased cancer prevalence? In other words, could demolition of the building prevent future investigations from collecting necessary data, or have sufficient samples been collected to date?

Additional environmental sampling of the physical space is unlikely to provide meaningful new information about past exposures. This is because environmental testing can only document exposures on the days of sampling and in the locations sampled.

Therefore, although we understand the thought, additional sampling is unlikely to strengthen a future causal analysis. A feasibility assessment committee considering a specially designed epidemiologic study may benefit more from focusing on whether historical exposure records, prior sampling data, and individual health records are sufficient to support that work.