Review of AECOM Memo on Vapor Intrusion Risk Evaluation Building 1156
November 29, 2021

Based on a quick review our preliminary comments are:

The analysis in AECOM's memo results in a hazard quotient (HQ) below levels of concern but its documentation is not complete enough to understand if the results are justified. We believe additional follow up will be helpful and have identified "preliminary questions" below for Chemours/AECOM.

AECOM's attenuation factor for the extrapolation of a sub-slab gas concentration to an indoor air concentration assumed a very high building ventilation rate that would dilute the sub-slab gas as it enters the building but did not provide documentation or details of how the ventilation rate was calculated. Hourly air exchange values for non-residential buildings are highly dependent upon building use and can range widely (on the order of approximately 0.3 to 4.1).[1] AECOM used an hourly exchange rate of 6.98, which roughly equates to replacing all the air in the building every 9 minutes.

The AECOM analysis also appears to have only focused on air exchange on the first floor of the building. Upper floors of the building appear to have been removed from the calculation although it is not clear why. It is possible that the construction of the building would justify this, but the justification was not provided. Using the volume of the entire building would reduce the air exchange rate by a factor of 3. Other building information that would help inform VI potential were not included (e.g., is ventilation via an exhaust fan that creates negative pressure in the building?).

AECOM's HQ for PFOA was also reduced by applying an exposure ratio based on 8 hours per day and 250 days per year, which is consistent with standard non-residential exposure assumptions for a composite worker. The exposure ratio could potentially justifiably be lowered further based on Chemours' statement that workers do not spend their entire shift in the Building 1156.

NJ DEP Division of Science and Research has developed a proposed inhalation toxicity value for PFOA that is illustrative and useful for comparison purposes. It is likely that Chemours and AECOM was not aware of the proposed value. AECOM did not use New Jersey's PFOA inhalation toxicity value, which would result in a higher HQ (nearly double).

AECOM used the ECHA toxicity value for 6:2 fluorotelomer alcohol (FTOH) but we note that this is not a high-quality reference concentration and results in a low confidence 6:2 FTOH conclusion.

AECOM's assessment did not address all of the PFAS measured in the sub-slab gas samples.

Additional, information noted below would be helpful, however, a well-designed, longer-term sampling system and employee biomonitoring would provide more direct information to ensure worker safety.

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[1] P. 30: [HYPERLINK "https://www.epa.gov/sites/default/files/2015-09/documents/oswer-vapor-intrusion-technical-guide-final.pdf"]

Preliminary questions:

The ECHA toxicity benchmark is based on one study for one FTOH. Our initial review indicates that some relevant toxicology studies cited in peer reviewed publications were not considered by ECHA. Does Chemours or DuPont have FTOH toxicity and metabolism data that is not publicly available?

What toxicity values does Chemours recommend using for other PFAS for which screening risk values were not calculated (i.e., PFBA; PFHxA; and 4:2, 5:2, 7:2, 8:2 and 10:2 FTOHs)?

How was the building air exchange rate determined? Typically building air exchange rates change seasonally. Is there an estimated range of exchange rates for Building 1156?

What consideration was given to using the estimated rate at which sub-slab gas enters the building (Qsoil)? The default Qsoil value (5 L/min = 0.3 L/m^3) was used. Was an assessment made on the slab of Building 1156 relative to the sources for the default value? Are cracks, holes, or openings visible? Is there a sump system? What other building design features and systems would be expected to influence VI levels? Please note that site-specific adjustments to the attenuation factor are not permitted pursuant to NJDEP regulations and technical guidance.

Has longer-term sampling been conducted measuring average PFAS air concentrations in the building? If so, can the data and methodology (e.g., procedure, sorbent material, spiking, etc.) be provided? Is employee biomonitoring done (e.g., blood samples) measuring PFAS levels?