-----Original Message-----
From: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>
Sent: Wednesday, December 04, 2019 3:34 PM
To: Walker, Stuart <Walker.Stuart@epa.gov>; Noto, Katie <boluska@ornl.gov>
Cc: Dolislager, Fredrick G. <dolislagerf1@ornl.gov>; Clements, Julie A CIV (USA) <Julie.A.Clements@usace.army.mil>
Subject: RE: [EXTERNAL] RE: Draft for Army Corps review -- radon intrusion into buildings calculator

Stuart, please find my comments attached. Looks pretty good. I will keep playing with it but thank you for the opportunity to review.
Dave

-----Original Message-----
From: Walker, Stuart
Sent: Friday, November 01, 2019 6:10 PM
To: Garufi, Katherine <Garufi.Katherine@epa.gov>
Subject: Draft for Army Corps review -- radon intrusion into buildings calculator

Hi Kate, this email is to request review of the draft Radon Vapor Intrusion Screening Levels (RVISL) Calculator by the ACE under your contract. I was hoping to get comments by Friday November 22.

The RVISL calculator can be used for risk based, dose based (if a dose based standard that includes radon is used for ARAR compliance), WL or Working Levels based (for UMTRCA as an ARAR compliance) and 4 pCi/l (for state standards as an ARAR compliance).

The RVISL may be found at this URL:
https://epa-visl.ornl.gov/radionuclides/
[redacted]

The RVISL is set up in a similar manner as the existing Vapor Intrusion Screening Level (VISL) calculator which may be found at:
https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator

I can be contacted if you have any questions at (703) 603-8748

Model comments:

1. The models work well.

2. Recommend model outputs be in pCi/l rather than pCi/cubic meter, or allow user to specify output units.

3. There appears to be some discrepancy between how total dose/risk is calculated from different models. As an example I used the groundwater Rn-222 concentration to determine dose/risk. I then used that model output of indoor air concentration of Rn-222 and put it into a different calculation as the measured indoor air concentration. The total dose/risk for the same indoor concentrations between the models differed significantly. The dose/risk from Rn-222 itself was identical but total dose was significantly different. The difference appears to be the daughter contributions. This may be confusing to some users as the total dose would be expected to be the same from same indoor air concentrations.

4. The addition of Pb-210 as a daughter product and assigning risk and dose from it should be based on ingrowth. It is unclear if it is ingrown or just assumed to be in equilibrium. I may have missed it but recommend the branching ratios and decay ingrowth factors be discussed.

Editorial:

E1. User guide Webpage: States: “It is suggested that users read the RVISL FAQ page before proceeding.” However, link is titled “Frequent Questions”. Recommend the words “Frequent Questions” replace “FAQ” in the sentence.

E2. Section 1.1: The introduction section calls the model into question. Rather than stating “Radon is gas at room temperature and these criteria will be ignored for this calculator.”; recommend the guide state why the model can/should be used. Also, recommend the term Advective Transport be defined in the text.

E3. Section 1.2: Recommend clarification or deletion of the sentence “This calculator only offers one output option whereas other EPA risk and dose calculators off three options.” It offers little context and is somewhat contradicted by sentence in next paragraph that states “The risk and dose-based outputs ….”

E4. Section 1.3.1: Recommend here and throughout that all acronyms be spelled out at first use (eg. HEAST, ICRP, etc.).

E5. Section 1.4 para 2: States: “2.Vapor Pressure (VP) (mmHg> at 25°C) is taken from Table 11.” This sentence should be linked to the next sentence stating reference (delete period). LEL is used throughout the guide, is this necessary? Recommend explaining why in text or delete.

E6. Section 2.4 and the RVISL equation page link do not provide equations but state the following: “•Pure Phase Vapor Pressure - Radon and Thoron are considered sufficiently volatile and toxic to pose inhalation and external exposure risk via vapor intrusion from a soil source. •Groundwater Vapor Concentration - Radon and Thoron are considered sufficiently volatile and toxic to pose inhalation and external exposure risk via vapor intrusion from a groundwater source.” Consider removal from the equation links and place in general discussions sections.

E7. Section 4.4: Clarify or delete as repetitive the sentence: ”he measurement of air exchange rates can be done by placing tubes that emit and collect perfluorocarbon tracers throughout a building”.

E8. Note: USACE appreciates the calculations for workers exposure. This mitigates a problem with how Rn is typically regulated (one standard for all buildings regardless of exposure scenarios).

E9. I recognize the model use is voluntary but assume it may be required in the future. Given the relative high risk from Rn the calculated screening levels are typically very low and often below the detection capabilities. It would be beneficial to have some comparison to detection limits or guidance such as PQLs on the chemical side.