Message

From: Craig Bias [cbias@remwerks.com]
Sent: 4/30/2021 3:14:56 PM
To: Hays, David C Jr CIV USARMY CENWK (USA) [David.C.Hays@usace.army.mil]; Praskins, Wayne [Praskins.Wayne@epa.gov]; Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) [derek.j.robinson1@navy.mil]
CC: Liscio, Matthew P CIV USN NAVSEA DET RASO VA (USA) [matthew.liscio@navy.mil]
Subject: RE: HPNS Navy RESARD BUILD Results

We'll get there. I believe it is calculating the intake activity which simplifies to RMVFR*Q(t). Q is the fixed surface activity and is what varies with time due to all the gain and loss processes.

As you ponder the ingestion rate, I still think our CSM is settled dust and therefore we should be calculating indirect ingestion. To do that with the same assumptions as we did with direct, the rate for a 12x12 room and lower walls would be the total area (~43 m^2) divided by the exposure time (~123,500 h) or 3.46E-04/h which is 3.5x higher than the default. Air release fraction needs to be non-zero. We would use the spreadsheet as we did with direct. As an example, even with the air fraction at 1, Cs ingestion dose is 1 mrem and ingestion risk is 8.5E-07.

From: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>
Sent: Friday, April 30, 2021 9:57 AM
To: Craig Bias <cbias@remwerks.com>; Praskins, Wayne <Praskins.Wayne@epa.gov>; Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1@navy.mil>
Cc: Liscio, Matthew P CIV USN NAVSEA DET RASO VA (USA) <matthew.liscio@navy.mil>
Subject: RE: HPNS Navy RESARD BUILD Results

Craig, Thank you. FYI: I believe Q is what the spreadsheet column M is basically calculating. Still think simple enough to rearrange equation to provide a better estimate of the actual value RESRADBLd is using in the dose calculation. In that the RESRADBLD dose is the basis for the spreadsheet calculation, I believe being closer to the value that RESRADBLD uses to determine the dose is our most defensible position. Always willing to discuss.

Hope all have a great weekend,
Dave

From: Craig Bias <cbias@remwerks.com>
Sent: Friday, April 30, 2021 9:28 AM
To: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>; Praskins, Wayne <Praskins.Wayne@epa.gov>; Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1@navy.mil>
Cc: Liscio, Matthew P CIV USN NAVSEA DET RASO VA (USA) <matthew.liscio@navy.mil>
Subject: [Non-DoD Source] RE: HPNS Navy RESARD BUILD Results

Dave, I'm reporting the cumulative equivalent dose (mrem) over the exposure period (about page 11 in output), not the average equivalent dose rate (mrem/yr) reported on the last page.

I disagree that we need to calculate Q, but will let you look into as well. Cheers.

From: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>
Sent: Friday, April 30, 2021 8:40 AM
To: Praskins, Wayne <Praskins.Wayne@epa.gov>; Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1@navy.mil>
Cc: Liscio, Matthew P CIV USN NAVSEA DET RASO VA (USA) <matthew.liscio@navy.mil>; Craig Bias <cbias@remwerks.com>
Subject: RE: HPNS Navy RESARD BUILD Results

Wayne, In short; the larger the source, the more activity is available to be ingested. Since we are modeling the source as the entire floor and walls to 2m high, the building dimensions set/equal the source. I still believe with some additional survey work and actual data, the Conceptual Site Model (CSM) could be modified which would change how modeled and likely resolve many issues (obviously just my opinion and realize simplified). In lieu of that, we are taking a conservative approach which results in the issues we are trying to solve. The approach is typical so not criticizing it, just does not always end up with our issues. It should be noted that not all the terms of equation E.2 are discussed in the email. For example the ingestion rate (1/h) term is related to source area as well, the removable fraction, and other terms also impact the result.

I believe the Qns(t) term is what we need to make the DON spreadsheet work well (a better approximation) for ingestion risk. Still looking into external.

Note:
$Q_{ns}(t)$ = total average radionuclide activity over the exposure duration, ED, in the source (pCi) at time t.

Craig, for the summed ingestion dose presented in the spreadsheet column K, is this the sum of doses for each time evaluated as discussed in RESRADBLD user manual J.1.4? Just want to make sure I am comparing apples to apples. Also note other discussions (e.g. building lifetime etc.) in this section, may be able to use to help with CSM, but defer to you on that?

All, The ingestion rate (1/h) term also requires adjustment. The calculation does not match how RESRADBLD suggests and is difficult to compare to EFH accordingly. I will send another email with more details on this and will relate the value to the EFH as well. Additionally, I am looking into the different assumptions of fraction in compartment (room) (Fi) between DON 0.542 and BPRG 0.67. Hope to have more on that next week.

Hope this helps. I apologize for the long email.
Dave

From: Praskins, Wayne <Praskins.Wayne@epa.gov>
Sent: Thursday, April 29, 2021 5:28 PM
To: Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1@navy.mil>
Cc: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>; Liscio, Matthew P CIV USN NAVSEA DET RASO VA (USA) <matthew.liscio@navy.mil>; Craig Bias <cbias@remwerks.com>
Subject: [Non-DoD Source] RE: HPNS Navy RESARD BUILD Results

I see in Equation E.2 that dose (and risk) via the ingestion pathway is proportional to contaminated area. What is the rationale for assuming a 12' 12' room if larger room/building sizes increase the estimated dose and risk?

Wayne Praskins | Superfund Project Manager
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From: Craig Bias <cbias@remwerks.com>
Sent: Thursday, April 29, 2021 10:00 AM
To: Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1@navy.mil>; Praskins, Wayne <Praskins.Wayne@epa.gov>
Cc: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>; Liscio, Matthew P CIV SEA 04, NAVSEA DET RASO <matthew.liscio@navy.mil>
Subject: RE: HPNS Navy RESARD BUILD Results

Sorry, I mistyped 17.7 pCi Co below... I meant 9.61E+06... compared to the calculated unit intake activity of 5.43E+05 in Column M.

From: Craig Bias
Sent: Thursday, April 29, 2021 11:44 AM
To: Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1@navy.mil>; Praskins, Wayne <Praskins.Wayne@epa.gov>
Cc: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>; Liscio, Matthew P CIV SEA 04, NAVSEA DET RASO <matthew.liscio@navy.mil>
Subject: RE: HPNS Navy RESARD BUILD Results

Here is an input file for Co-60 to check our DCFs.

For clarification on a couple things today regarding Equation E.2 in BUILD manual.

- D(t) is not an instantaneous direction ingestion dose, but rather an integrated dose over the 26 years.
- Q(t) is basically the total source activity and is 100% fixed. That is the input activity concentration (2.25E+05 pCi/m2 for Co-60) times the total contaminated area (~43 m^2) or ~17.7 pCi for Co-60.
- Since the ingestion DCF and SF are dose per unit intake, we need to redefine the quantity in Column M (estimated activity, pCi). That is the calculated unit intake (pCi) and quantitatively is (24 ED Fin Fi) ERl fR Q(t) in Eqn E.2. It is not just Q(t).
- Similarly, since the external DCF and SF are dose per unit time-integrated activity concentration, we need to redefine the quantity in Column W (estimated activity concentration, pCi/m^2). That is the calculated unit time-integrated activity concentration (1/yr/pCi/m^2) if we use the surface DCFs. RESRAD is actually assuming the source term is a volume source that is 0.01 cm thick and uses Eqn F.1 and the volume DCFs. To calculate W, I guess we could divide the external dose by the volume DCFs to get the unit time-integrated activity concentration (1/yr/pCi/g) and then multiply by the soil volume SFs, but it should be a similar result.

Craig

From: Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1@navy.mil>
Sent: Thursday, April 29, 2021 11:11 AM
To: Praskins, Wayne <Praskins.Wayne@epa.gov>
Cc: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>; Craig Bias <cbias@remwerks.com>
Subject: RE: HPNS Navy RESARD BUILD Results

Yes, please do. I encourage the information exchange.

I included Craig on this response, so that he knows to expect your call.

Derek

From: Praskins, Wayne <Praskins.Wayne@epa.gov>
Sent: Thursday, April 29, 2021 8:41 AM
To: Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1@navy.mil>
Cc: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>
Subject: [Non-DoD Source] RE: HPNS Navy RESARD BUILD Results

Derek –

Thanks for setting up this morning's call. To keep things moving, is it OK for Dave to call Craig Bias if he has additional questions?

Wayne Praskins | Superfund Project Manager

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From: Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1@navy.mil>
Sent: Tuesday, April 27, 2021 12:49 PM
To: Praskins, Wayne <Praskins.Wayne@epa.gov>
Cc: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>
Subject: RE: HPNS Navy RESARD BUILD Results

Thanks Wayne and Dave! I sent the follow-up meeting request and will let you know.

From: Praskins, Wayne <Praskins.Wayne@epa.gov>
Sent: Tuesday, April 27, 2021 12:05 PM
To: Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1@navy.mil>
Cc: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>
Subject: [Non-DoD Source] HPNS Navy RESARD BUILD Results

Derek –

Dave Hays and I had a chance to talk about last week's Navy building RG submittal this morning. Dave has a question or two he would like to ask and should be able to join us this Thursday; I just forwarded your invite.

I don't expect we'll be able to have a detailed discussion on Thursday and would like to schedule a followup call for next week. Dave is in training Monday thru mid-day Thursday; is your group available for a followup call Thursday, 5/6 between noon and 2 PDT? I'm copying Dave on this email.

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