

**RAIs for Vermont Yankee 20.2002 Request
August 2020**

1. Comment:

The version of the Site-Specific Dose Assessment Methodology (SSDA) used for the calculation of the doses for the appears to differ from the version reviewed by the NRC in 2018.

Basis:

US Ecology, Inc. (USEI) previously requested NRC's review of Version 3 of their SSDA methodology (Agencywide Documents Access and Management System [ADAMS] Accession No. ML17230A221). During this review, USEI submitted an updated revision, Version 3a, of the SSDA spreadsheet and Technical Basis Document to the NRC. This revision corrected an error in the spreadsheet and contained other changes to certain assumed parameter values. One parameter value that was changed that affects the projected dose from the disposal of the waste included in the Vermont Yankee request is the waste contact time for the treatment workers. In Version 3a of the SSDA, the tanker survey time was incorporated into the treatment worker task, and 10 minutes of exposure time was added to the treatment worker task resulting in a total waste contact time of 55 minutes or 0.92 hr. However, in the calculations submitted for the current 20.2002 disposal request, a waste contact time of 45 minutes (0.75 hr) was assumed.

The NRC based its conclusion that the use of Version 3 was an appropriate method to evaluate future proposed disposals at USEI and that the SSDA methodology can be used to satisfy the criteria in 10 CFR 20.2002(d) on its review of the final Version 3a of the SSDA (ADAMS Accession No. ML18164A070). Any differences between the calculations in the spreadsheet reviewed previously by the NRC and the calculations used in the current submittal would need to be reviewed by the NRC. However, it is not clear what, if any, additional differences (aside from the treatment worker waste contact time) exist between the version of the calculations reviewed by the NRC and the calculations used for the disposal of water from Vermont Yankee.

Path Forward:

- Provide a justification that the exposure time of 0.75 hr used for the treatment worker task is appropriate or provide an updated calculation of the treatment worker dose including a contact time of 0.92 hr.
- Provide a list of any other changes to the calculations between the final Version 3a spreadsheet and methodology reviewed by the NRC (ADAMS Accession Nos. ML18085A238 and ML18124A017) and the version used to calculate the doses for the VY request.

2. Comment:

The potential dose for an individual who excavates or drills into the waste reported in this 20.2002 request exceeds the “few millirem” dose criteria.

Basis:

The doses reported in this 20.2002 request for the “Construction Scenario” and “Well Driller Scenario” are 7.67 mrem/yr and 7.2 mrem/yr, respectively, which is slightly above the “few millirem” dose criteria the NRC uses for evaluating 20.2002 disposal requests. In the 20.2002 request, it is stated that these inadvertent intruder doses are not intended to be applied to the “less than a few millirem” criteria. A basis was not provided for why these scenarios were not considered to be plausible scenarios. The reported doses do appear to be calculated using conservative assumptions and a more realistically calculated dose might be expected to be lower. For example, the dose calculation for the “Construction Scenario” did not appear to take credit for the mixing of the waste with clean material located above the waste. Similarly, the dose calculation for the “Well Driller” scenario did not appear to take credit for the mixing of the waste with clean material located above the waste or with clean material located between the waste and the resource the well driller is attempting to reach (e.g., the groundwater table).

Path Forward:

- Provide a justification for why the “Construction Scenario” is not plausible for the USEI site or provide a dose estimate demonstrating that the dose from this scenario is within a “few millirem”.
- Provide a justification for why the “Well Driller Scenario” is not plausible for the USEI site or provide a dose estimate demonstrating that the dose from this scenario is within a “few millirem”.

3. Comment:

Information is needed on the potential for disposal of waste under the previous 20.2002 request for Vermont Yankee and the current request in the same calendar year.

Basis:

The NRC previously approved the disposal of water from Vermont Yankee at the USEI facility under 20.2002. The timing of the final shipments of the water included in the previously approved 20.2002 from Vermont Yankee to USEI is unclear. When waste is disposed under multiple 20.2002 requests from the same licensee to the same disposal facility during the same calendar year, the “few millirem” criteria for that year would apply to the combined dose from all of that licensee’s 20.2002 requests.

Path Forward:

- Provide the volume of waste, if any, from the previous 20.2002 request for Vermont Yankee that could be disposed in the same calendar year as the waste in the current 20.2002 request.

- If waste from the previous 20.2002 request is anticipated to be disposed in the same calendar year as the current request, provide an estimate of the expected combined annual dose from the previous Vermont Yankee 20.2002 request for disposal of water at USEI and the current one.

4. Comment:

More information is needed on the transfer of contaminated water to and from the tanker trucks.

Basis:

The 20.2002 request states that after the water is received at the rail transfer facility, the railcar is surveyed and then the water is transferred into tanker trucks for the final drive to the USEI facility. At the USEI facility, the water is transferred into a steel pan for stabilization with clay. The 20.2002 request provides doses for the gondola surveyors who survey the railcar when it arrives at the rail transfer facility, the tanker truck drivers who drive the water to the USEI site, and the stabilization workers. It is not clear if there are any other individuals who could potentially receive a dose from the water included in this 20.2002 request. For example, it is not clear if there are any additional workers who could receive a dose during the transfer of water from the railcar to the tanker truck. It is also not clear if any cleanout and/or survey is needed for the railcars and tanker trucks, and, if so, if anyone could potentially receive a dose in this process.

Path Forward:

- Provide information on whether any additional workers, beyond those that were evaluated in this 20.2002 submittal, could potentially receive a dose from the water included in this 20.2002 request. If any additional workers could potentially receive a dose, provide a justification that their dose is bound by the dose of the workers previously evaluated or provide a calculation of the potential dose for the additional worker roles.
- If the railcars and/or tanker trucks are not cleaned out and surveyed after the transfer of water, provide information on the process that will be used to ensure that there is no potential for individuals to be exposed to residual radioactivity in the railcars and tanker trucks.

Clarification Question:

- C1.** Clarification is needed on the volume of waste used in the calculation of the potential dose. The 20.2002 request consists of the disposal of “2,000,000 gallons (~267,000 ft³)” of water. However, the volume of waste included in the SSDA calculation worksheet is 272,109 ft³. Please clarify the intended volume of waste in this 20.2002 request.