Honeywell
THE POWER OF **CONNECTED**

Performance Materials and Technologies
2768 North U.S. 45 Road
P.O. Box 430
Metropolis, IL 62960
www.honeywell.com

February 4, 2019

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Director, Office of Nuclear Material Safety and Safeguards
11555 Rockville Pike
Rockville, MD 20852

Docket No. 40-3392; License No. SUB-526

SUBJECT: HONEYWELL METROPOLIS WORKS RESPONSE TO RAIs FOR THE UNIMPORTANT QUANTITY DOCUMENT SUBMITTED ON JULY 12, 2018

On July 12, 2018 Honeywell Metropolis Works (MTW) submitted a document on the unimportant quantities (UIQ) determination related to the Closure of Surface Impoundment Ponds B, C, D, and E at MTW. The U.S. Nuclear Regulatory Commission (NRC) staff completed the review of the document and provided MTW with a Request for Additonal Information (RAI) on the original submittal. A draft of the MTW RAI response was sent via email on December 17, 2018. A teleconference was held between NRC and MTW staff on January 8,2019. The due date was revised to February 13, 2019 per the NRC Project Manager. A second teleconference was held between NRC and MTW staff on January 24, 2019. Following the discussion on January 24, 2019, this letter transmits MTW's final response to the RAI.

We hope that you find the enclosed materials to be complete and that our response is helpful in furthering your review of the MTW UIQ document. If you have questions or comments regarding this submittal, please contact Mr. Sean Patterson, Regulatory Affairs Manager at (618) 524-6341.

Sincerely,

Jeff Fulks
Plant Manager

Enclosure 1 – Response to RAI on July 12, 2018 UIQ Document

Cc: U.S. NRC Region II
Attn: Tilda Liu
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, GA 30303-1257

NMSSZD

Honeywell Metropolis Works
USNRC Source Materials License SUB-526
Docket No. 40-3392

Response to Requests for Additional Information on
Unimportant Quantity Submittal Dated July 12, 2018

UIQ - RAI 1

As proposed in Section 3.2, Waste Packaging and Transport, Honeywell plans to load the waste material into supersacks and, after each supersack is surveyed, arrange the supersacks within the rail gondola car in such a manner that ensures that the average shipment content in each gondola car meets the Title 10 of the Code of Federal Regulations (10 CFR) Paragraph 40.13(a) requirements for unimportant quantities. As described, this approach could result in individual supersacks exceeding unimportant quantity limits, even if the net average over the entire rail car is below the unimportant quantities limit.

This approach is inconsistent with the U.S Nuclear Regulatory Commission's (NRC's) policy regarding mixing that is documented in the Concentration Averaging and Encapsulation Branch Technical Position, Revision 1 (BTP). As discussed in the BTP, blending and averaging can only occur within a single unit or container and, in this case, the supersack is the single unit. Although the BTP was originally developed to address averaging considerations for 10 CFR Part 61-related waste, this approach would also apply to other NRC-regulated material, including the radioactive waste being considered for transport and disposed at US Ecology.

Honeywell is requested to provide the regulatory basis for which the proposed act of mixing complimentary supersacks would be acceptable and ensure that the receiving entity, US Ecology, does not come into possession of source material at greater than unimportant quantities by re-arranging the supersacks during receipt, handling or disposal operations; or consider modifying the approach for packaging to ensure that each supersack meets the 10 CFR 40.13(a) requirements for unimportant quantities.

Response

Honeywell recognizes a mutual interest in developing and implementing an approach to blending waste materials in a manner that not only meets regulatory expectations but also ensures safety of the general population from potential releases of or exposures to radioactive material during or after disposal at US Ecology (USE). This response seeks to describe Honeywell's interpretation of how known pond material waste characteristics are applied to the regulatory framework for waste disposal of an unimportant quantity of source material, specifically 10CFR40.13(a). Furthermore, Honeywell agrees that although the BTP referenced in the RAI was originally developed to address averaging considerations for 10 CFR Part 61-related waste, the BTP provides a useful approach for concentration averaging of other radioactive wastes such as averaging of source material and unimportant quantities of source material within a specified waste package. The portions of the BTP pertaining to blendable material form the regulatory basis for Honeywell's assessment of the waste presented for shipment and disposal.

Honeywell considers the waste to be disposed of as a single "waste stream" and "waste type" as defined in the BTP.

Section 3.1.1 of the BTP states in part:

> "Waste streams are considered distinct (i.e., different from one another) if the concentrations of radionuclides of concern (see the Glossary) typically differ by more than a factor of 10"

As shown in Table 3-1 of Honeywell's UIQ submittal, the radionuclide concentrations for each isotope across the four ponds are within a factor of 10, with one non-material exception. (Th-228 concentrations range from 0.04 pCi/g to 0.43 pCi/g.)

Section 3.1.2 of the BTP further states in part:

> "Waste is considered to be a single waste type if the waste has relatively uniform physical characteristics."

The material being sent for disposal at USE was generated from a single process in which wastes predominantly containing relatively inert calcium fluoride were settled into storage ponds. The waste therefore has a "relatively uniform" concentration of radionuclides of concern and physical characteristics.

Because the pond material is a single waste stream and waste type as defined in the BTP, the guidance provided in section 3.2.1, *Concentration Averaging for a Single Blendable Waste Stream,* of the BTP is applicable. This section states in part:

> "If a waste package contains a single blendable waste stream, radionuclide concentrations for waste classification may be averaged over the waste in the package. That is, an

average radionuclide concentration may be based on its total activity in the package divided by the volume or mass of the waste in the package."

The BTP recognizes a distinct difference between "blendable" material and material that is "blended" during preparation for disposal. From the BTP glossary definition of blendable waste:

> "For the purposes of this CA BTP, a waste type is "blendable" if:
> (1) the waste can be physically mixed to create relatively uniform radionuclide concentrations or
> (2) the waste is not expected to contain durable items with significant activity.
>
> Footnote 48: Radionuclide concentrations are "relatively uniform" if an intruder who encounters the waste is unlikely to encounter waste more concentrated than the class limit by a factor of 10."

In addition to providing a contextual definition of "blendable waste" the footnote definition of "relatively uniform" assists in providing an important upper bound on the concentration of radioactive material that may be found to be present at the disposal site. Specifically, a factor of 10 higher than the disposal class limit.

In general, a vast majority of the shipments are expected to contain "blendable material" in discrete supersacks that has not been intentionally blended for purposes of meeting the unimportant quantity of source material limit. The staff's assertion in the RAI that the proposed approach could result in individual supersacks exceeding unimportant quantity limits, even if the net average over the entire rail car is below the unimportant quantities limit is theoretically valid. However, for disposal of an unimportant quantity of radioactive material, waste is considered "relatively uniform" if the maximum concentration of source material in any "Hot Spots" remain less than a factor of 10 higher than the 10CFR40.13(a) limit for an unimportant quantity. The characterization data for the Metropolis pond material indicates that all materials are well within the upper concentrations proposed in the BTP for relatively uniform, blendable wastes.

To provide an adequate margin of safety between measured concentrations and this threshold, in addition to selectively loading supersacks based upon content and averaging of the entire contents of the railcar to concentrations below 500 ppm, an action level on the source material concentration within any one supersack loaded into a railcar shall be imposed such that each supersack has a concentration that remains within a factor of 10 of the unimportant quantity limit prior to being loaded into the waste package. Supersacks found to measure more than this action level will receive further blending with other pond materials to a concentration below the action level before being loaded into a railcar. Therefore, all material in the package will confidently meet the described definition of relatively uniform in addition to the average concentration of the entire package meeting the 500 ppm threshold for an unimportant quantity of source material.

With respect to the relevant container for purposes of blending and averaging, Honeywell is not packaging, preparing or manifesting the supersacks as waste packages for either transportation

or ultimate disposal. Each railcar shall have a large interior liner that secures and encloses the pond material for transportation. This liner shall be sealed shut prior to release of the railcars from the restricted area. Rather than dumping pond material directly into this interior liner, Honeywell is using the supersacks as intermediate containers for improved handling and bulk material management during onsite storage (e.g., relative to a stockpile) and to facilitate railcar loading. The package being offered for transportation and disposal is the fully loaded gondola railcar profiled as a bulk radioactive material shipment. This approach is consistent with the definition of package within 49CFR173.403 which states that:

> "Package means the packaging together with its radioactive contents as presented for transport."

The BTP provides additional context in section 3.2.2, *Concentration Averaging for Multiple Blendable Waste Streams*, which states in part:

> "In some cases, blendable waste streams of the same waste type (e.g., primary and secondary resins) may be combined in the same container without blending. If the CA BTP Table 1 thresholds are not exceeded, the waste does not need to be blended and the radionuclide concentrations can be averaged over the volume of the waste or container as a single waste stream (i.e., as in Section 3.2.1)."

As previously described, the maximum radiological content for any supersack will be limited to less than a factor of 10 of the unimportant quantity threshold. A sum of fractions in comparison to the unimportant quantity of source material limit more than 10 is not mathematically possible for a railcar. Therefore, the first category of characteristics of most concentrated influent waste stream "Sum of fraction less than 10" is applicable. In this category, there is "No limit" to the volume of the mixture to be used to demonstrate adequate blending under all listed waste classifications. Therefore, in practice no additional blending of supersack bags is required.

Considerations for "adequate blending" described in section 3.2.2 of the BTP, *Concentration Averaging for Multiple Blendable Waste Streams,* provide an alternate basis for the proposed approach. Table 4 of the BTP, describes in part an allowable classification volume or mass for two or more blendable waste streams that have been combined (e.g., placed in a single container) but which have not been physically mixed together. This classification again refers to Table 1 which again places no limit on the volume of the mixture being averaged due to the discussed single supersack concentration limit. As a result, Honeywell's approach is consistent with section 3.2.2 of the BTP and no changes to the proposed approach to blending and averaging of the material is necessary.

US Ecology will treat the gondola railcars as 'bulk' packages of waste upon receipt and will offload the railcars en masse without regard to the individual contents of each supersack. Supersacks that have been loaded into lined railcars will be offloaded at an offsite rail-transfer facility into trucks using a mechanical excavator. No individual supersacks will remain intact following

unloading from the railcar. Although not implicitly required from a regulatory perspective, additional, incidental blending of pond material will occur while unloading each railcar and during final disposition of the material at the waste disposal site due to these bulk handling methods.

NRC has accepted averaging of radioactive materials in gondola railcars to US Ecology previously. An example is the Hematite Decommissioning Project in Missouri which shipped 175,000 tons of low-enriched uranium and byproduct material to US Ecology Idaho (USEI) between 2011-2015. Westinghouse was authorized by NRC to blend in small quantities of higher activity soils and debris into bulk quantities of low-activity material in gondola railcars provided that it could be shown that both project procedural requirements and USEI's waste acceptance criteria were being met. Westinghouse successfully blended higher-activity project wastes into the gondola railcars throughout the project and these wastes were received and offloaded as bulk packages at USEI in the same manner as what is being proposed for Honeywell Metropolis.

10CFR40.13(a) states in part:

> Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the Act to the extent that such person receives, possesses, uses, transfers or delivers source material in any chemical mixture, compound, solution, or alloy in which the source material is by weight less than one-twentieth of 1 percent (0.05 percent) of the mixture, compound, solution or alloy.

The considerations and practices presented in this document describe that in addition to ensuring each package presented for shipment is by weight less than 500 ppm or 0.05 percent, the physical nature and radioactive contents of the material is relatively uniform. Thus, no additional blending of the material is merited. Therefore, Honeywell intends to transfer unimportant quantities of source material that meet the requirements of 10CFR40.13(a) from the calcium fluoride settling ponds in lined railcars to US Ecology for disposal as waste.