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DEPARTMENT OF ECOLOGY

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August 4, 1992

Mr. Eric Goller
U.S. Department of Energy
Richland Operations Office
P.O. Box 550
Richland, WA 99352

Dear Mr. Goller:

Re: HSBRAM, M-29

Ecology transmitted Comments to the U. S. Department of Energy (USDOE) May 19, 1992, on the Hanford Site Baseline Risk Assessment Methodology. The three parties met June 9, to discuss the Methodology (HSBRAM). Informal response to and status of the Comments was thereafter received from USDOE. Here are clarifications and proposed resolutions to several Ecology Comments.

Ecology Comment 21A

This Comment remains unresolved. Populations for the four future land use scenarios should be described with as much specificity as possible in the Methodology. To describe populations in each of the dozens of risk assessments that will be conducted would be redundant, inefficient, and potentially disruptive.

Ecology Comment 21B

This Comment may be resolved by the authors' partial response. Ecology will review the text to be provided by the authors before making a final determination. There will have to be significant additions to the Section, because it presently describes only current populations.

Ecology Comment 22

The reference EPA 1991a lists pathways that are "evaluated on a routine basis" for appropriate scenarios. These pathways are:

Ingestion of Potable Water
Ingestion of Soil and Dust
Inhalation of Contaminants
Consumption of Homegrown Produce
Consumption of Locally Caught Fish

The set of three bullets on HSBRAM, page 25, does not include:

Ingestion of Dust
Consumption of Homegrown Produce
Consumption of Locally Caught Fish

These three pathways must be added to the list to coincide with the explanation of the second sentence of the second paragraph of Section 2.2.3.2.

The reference EPA-10 1991, Table 4-1, lists ten pathways for appropriate scenarios. These are:

Ingestion of Water
Inhalation of Volatiles
Dermal Contact With Water
Consumption of Fish/seafood
Ingestion of Sediment
Dermal Contact With Sediment
Soil Ingestion
Dermal Contact With Soil
Inhalation of Particulates/volatiles From Soil
Consumption of Produce, Meat, Milk

The set of three bullets on HSBRAM, page 25, does not include:

Dermal Contact With Water
Consumption of Fish/seafood
Ingestion of Sediment
Dermal Contact With Sediment
Dermal contact with soil
Consumption of Produce, Meat, Milk

These six pathways must be added to the list to coincide with the explanation of the second sentence of the second paragraph of Section 2.2.3.2.

The reference EPA-10 1991, Table III, lists five pathways for appropriate scenarios. These are:

Water Ingestion
Soil & Dust Ingestion
Inhalation
Dermal Contact With Soil
Dermal Contact With Water

The set of three bullets on HSBRAM, page 25, does not include:

Dust Ingestion
Dermal Contact With Soil
Dermal Contact With Water

These three pathways must be added to the list to coincide with the explanation of the second sentence of the second paragraph of Section 2.2.3.2.

In summary, the following pathways must be added to the list to coincide with the explanation of the second sentence of the second paragraph of Section 2.2.3.2.

Ingestion of Dust
Consumption of Homegrown Produce
Consumption of Locally Caught Fish
Dermal Contact With Water
Consumption of Fish/seafood
Ingestion of Sediment
Dermal Contact With Sediment
Dermal Contact With Soil
Consumption of Produce, Meat, Milk

The discrepancies must be corrected. Each of the pathways must be expressly addressed. The "in addition" and "also selected" pathways do not fill the list and are out of context with the explanation on the second paragraph of the Section. The use of "include" in the introduction of the three pathways does not circumvent its incompleteness. Please provide a complete and coherent list of pathways that coincides with the references cited.

Ecology Comment 23

The language suggested in USDOE's Response acceptably addresses the concern expressed in the Comment.

Ecology Comment 26A

The point of departure for the application of future land use scenarios is that all four be applied at each site. To not use one or more scenarios would then have to be justified on a site-by-site basis, with the agreement of the operable unit managers. It may be possible for the Risk Assessment Working Group to agree on some aggregate area limitations on the scenarios, pending the conclusions of the land use stake-holders group.

Ecology Comment 26C

The current industrial land use scenario would be distinct from the future industrial land use scenario. The current situation is not truly a "scenario," since it represents actual conditions of worker access to and exclusion from potential exposure pathways. Institutional control is a remedial alternative, not a land use. Because current conditions depend on institutional controls, continuation of the current land use would actually be a remedial alternative. If the current land use is industrial, then the assessment of that scenario must assume the collapse of institutional controls, and the appearance of "civilian" industrial uses. Although USDOE may wish to conduct a risk assessment of current institutional conditions, such an analysis would not substitute for the future land use scenarios subject of Comment 26A.

Ecology Comment 31

The Comment was originally written in reference to the report on the draft Framework. Since then, the final Framework has been promulgated. The overall conceptual process, Figure 1, has not changed. Some of the components have been refined, most significantly the problem definition. Validity of the Comment has not diminished. If it is suggested that the Methodology depart from the Framework, then the advantages of that departure must be explained and justified. See below the discussion of Comments 32 & 37.

Ecology Comments 32 & 37

These two Comments would be resolved by adding a clarifying explanation after the first sentence of the first paragraph of Section 3.2. State that:

> This explanation of the problem definition process is based on the Framework for Ecological Risk Assessment, which should be examined for a full understanding of the process.

The reference to the draft Framework of Fava, *et al.*, in the first sentence would require updating.

Ecology Comment 38
EPA Comment 16

State the qualifications present in the Ecology and EPA Comments. Make the technical references. Allowing for "best professional judgement" is fine, but more methodological specificity is needed. State that this subject may be further developed in the future as site specific information becomes developed.

Ecology Comment 45

The Response does not provide a point for further discussion.

The authors may point out precisely where the Methodology "provides for the development of site-specific ecological information." The authors may reconcile the Methodology statement that "it is not possible to provide detailed guidance" with the Response that "the methodology provides for the development of site-specific ecological information." The authors may look to the Framework for Ecological Risk Assessment, Section 3.2.3., for support.

This Comment reflects issues similar to those of Comment 46. Comment 46 was accepted by USDOE. We expect to see a comprehensive list of potential site-specific ecotoxicological tests provided in the Methodology. This will help address the concerns expressed in Comment 45.

Ecology Comment 57

In Appendix A, age groups are not used consistently across a pathway. For example, the following table illustrates the information currently available for the residential scenario for noncarcinogens.

Pathway		Age Group Exposure Factors
Soil	-ingestion	children
	-dermal	children and adults
Air	-inhalation	children
Groundwater	-ingestion	children
	-inhalation	adults
	-dermal	adults
Surface Water	-ingestion	children
	-inhalation	adults
	-dermal	adults

Sediment	-ingestion	children
	-dermal	children and adults
Biota	-game	adults
	-fish	adults

A literal interpretation of the above table suggests that children drink tap water, but somehow avoid taking baths, showers, or breathing the air. Likewise, these children drink surface water without getting wet or breathing the air around the river. Also, they do not eat fish from the river or fruits/vegetables from their gardens. This type of illogical situation is present on many of the tables. A consistent and conservative approach for noncarcinogens is to assume child exposure to all pathways, at a minimum, and children and adults for every pathway.

The carcinogenic Tables have similar inconsistencies. We recommend that the 30-year exposure period be divided into 6-years as children, and 24-years as adults as a standard for all carcinogenic calculations, regardless of pathway.

Please feel free to contact me for discussions of any remaining issues. I shall be awaiting the proposed text from USDOE to resolve other comments.

Sincerely,

Steve Cross
CERCLA Unit
Nuclear and Mixed Waste Management Program

SC:dr

cc. Paul Day, EPA
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