United States
Environmental Protection
Agency

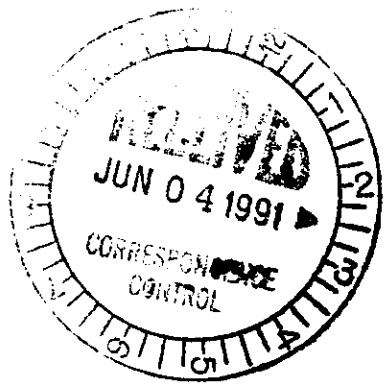
Region 10
Hanford Project Office
712 Swift Boulevard, Suite 5
Richland WA 99352

9102439

EPA

START

May 30, 1991



Robert K. Stewart
Unit Manager
U.S. Department of Energy
P.O. Box 550, A6-95
Richland, Washington 99352

Re: 1100-EM-1 Remedial Investigation

Dear Mr. Stewart:

This letter has several purposes. First, the enclosure to this letter should provide the clarifications requested by the U.S. Department of Energy (DOE) on February 28, 1991 (Ref: Letter, S. Wisness to P. Day).

Secondly, due to other commitments (e.g. Tri-Party Agreement negotiations) and internal communication problems, combined EPA and Ecology comments on the "Remedial Investigation Phase 2 Supplemental Work Plan for the Hanford Site 1100-EM-1 Operable Unit" and the "Phase I and II Feasibility Study Report for the Hanford Site 1100-EM-1 Operable Unit" will be delayed by not more than 30 days. I expect to send any comments on the above documents by June 28, 1991.

Finally, in response to the April 26, 1991 letter from Mr. Wisness to Mr. Day, I understand and agree that interim milestones M-15-01B (November 1991) and M-15-01C (April 1992) are in jeopardy. I will work with you to develop an aggressive and attainable schedule upon which to develop a change package.

If you have any questions, please call me at 376-3883.

Sincerely,

David R. Einan
Unit Manager

cc: R. Hibbard, Ecology
J. Stewart, USACE
T. Veneziano, WHC
Administrative Record (1100-EM-1)

CLARIFICATION OF 1100-EM-1 REMEDIAL INVESTIGATION ISSUES RAISED BY U.S. DEPARTMENT OF ENERGY

May 24, 1991

1. Identification of land areas for agricultural/residential land use exposure scenarios

The 1100-EM-1 subunits that should be included in the evaluation of risk from residential exposures for the baseline risk assessment are shown in Table 1. The rationale for including or excluding each subunit is also presented in Table 1.

The quantitative risk assessment of a residential scenario will provide risk estimates that are protective of agricultural health threats because an exposure pathway including homegrown vegetables and fruits is required. Agricultural scenarios do not need to be included in the baseline risk assessment. In addition, the health risk to agricultural workers is adequately addressed in the industrial scenario as provided in the baseline risk assessment (U.S. DOE, 1990).

2. Residential exposure scenario for the 1100-EM-1 baseline risk assessment

A residence should be located directly adjacent to each subunit. For the Horn Rapids Landfill, the residence should be placed near monitoring well MW-12.

Receptor populations should include typical populations such as children, adults, and the elderly.

Table 2 shows each subunit with its associated contaminants, exposure medium, and exposure routes. The information presented in Table 2 assumes that exposure to contaminants includes the following pathways: inhalation of vapors and particulates, accidental ingestion of soil, ingestion of homegrown vegetables and fruits, ingestion of drinking water, dermal contact with potable water, inhalation of vapors during showering, and dermal contact with soil.

The existing data are sufficient for performing residential risk assessments for the subunits listed in Table 1. All subunits should address exposure pathways related to contaminated soil. The Horn Rapids Landfill, however, should also address exposure pathways related to groundwater. Potential groundwater health threats will be assessed for the other subunits in the Phase 2 remedial investigation if the data support the need to do so.

It is appropriate to present the residential risk assessment in the baseline risk assessment uncertainty section.

3. Reasonable maximum exposure

A table summarizing exposure parameters used, references for those parameters, and rationales for using each parameter should be included as part of the baseline risk assessment.

Example calculations for one contaminant in each pathway should be provided in an appendix. The appendix should include generic equations as well as example calculations.

Reasonable maximum exposure parameters as outlined in Region 10 guidance (U.S. EPA, 1990a) should be used. If Region 10 guidance for a particular parameter is not published or established, then reasonable maximum exposure parameters as provided by U.S. Environmental Protection Agency (EPA) headquarters (1989) should be used. If U.S. EPA guidance is not available, then exposure parameters found in open literature or developed using professional judgment should be used.

4. Toxicity screening

The preliminary toxicity screening first compares contaminant concentrations to background, then to calculated toxicity screening criteria. The first step is acceptable. The second step may eliminate chemicals that individually may not pose a health risk, but cumulatively might pose health risks. Not enough information is provided by U.S. Department of Energy (U.S. DOE) (1990) to determine this. A table summarizing critical effects for all potential contaminants of concern before implementing the screening should have been provided in the Phase 1 remedial investigation report. Therefore, the acceptability of the screening method cannot be determined at this time.

Based on available information, the preliminary toxicity screening contains the following technical flaws:

- It appears that the screening criteria for lead is an applicable or relevant and appropriate requirement (ARAR). It is not appropriate for screening purposes to use an ARAR. Therefore, lead should be included in the baseline risk assessment.

- The use of the Occupational Safety and Health Administration's permissible exposure limit for polynuclear aromatic hydrocarbons (PAHs) as the surrogate residential exposure limit development is not appropriate. U.S. EPA (1990b) recommends that critical toxicity values for benzo(a)pyrene be used in the absence of critical toxicity values for PAHs. However, because the sampled PAH level exceeds the surrogate residential exposure limit screening criterion, and PAHs were not eliminated from the risk assessment at that point, it is not necessary to develop a new preliminary toxicity screening criterion for PAHs based on benzo(a)pyrene information. In the future, the critical toxicity values for benzo(a)pyrene should be used for developing a PAH toxicity screening criterion.

Lead appears to have been inappropriately screened out from the baseline risk assessment. Other contaminants with similar effects also may have been screened out. As mentioned above, the information provided by U.S. DOE (1990) does not allow determination of whether chemicals with cumulative effects were inappropriately eliminated.

U.S. DOE should submit a technical report that clearly presents the steps taken in the screening process. The report should be written as a self-contained document and should include:

- The rationale for using the preliminary toxicity screening (the rationale should consider the information presented in Section 5.9 of EPA risk assessment guidance)
- A step-wise description of the preliminary toxicity screening including all key decision points and a flowchart
- A list of all the potential contaminants of concern before screening with their associated key effects as listed in the EPA Integrated Risk Information System or other appropriate sources
- A list of the exposure parameters used for calculating the screening criterion, and justification of the use of parameters different from those given in EPA Region 10 guidance
- A list of reference doses and slope factors used for calculating the screening criterion
- Example calculations
- References as appropriate, and a reference list
- A list of contaminants of concern included in the baseline risk assessment

TABLE 1
RATIONALE FOR INCLUDING 1100-EM-1 SUBUNITS
RESIDENTIAL SCENARIO RISK ASSESSMENT

Subunit	Decision to Include	Rationale
Battery Acid Pit (1100-1)	No	The lead found in soil samples is most likely associated with backfill materials. The arsenic levels are not significantly elevated above background levels.
Paint and Solvent Pit (1100-2)	Yes	Significant levels of tetrachloroethene was found in soil. (Tetrachloroethene may also pose a groundwater health threat, but inclusion in the risk assessment will be based on Phase 2 RI results.)
Antifreeze and Degreaser Pit (1100-3)	Yes	Significant levels of lead, arsenic, and chromium were found in surface soil. (Chromium may pose a groundwater health threat, but inclusion in the risk assessment will be based on Phase 2 RI results.)
Antifreeze Tank Site (1100-4)	No	The tank has been removed and the subunit is located in a building. (Alpha and beta radiation may pose groundwater health threats, but inclusion in the risk assessment will be based on Phase 2 RI results.)
Radiation Contamination Incident (UN-1100-5)	No	Contamination no longer exists.

TABLE 1
RATIONALE FOR INCLUDING 1100-EM-1 SUBUNITS
RESIDENTIAL SCENARIO RISK ASSESSMENT
(Continued)

Subunit	Decision to Include	Rationale
Discolored Soil Site (UN-1100-6)	Yes	Significant levels of BEHP and chlordane were found in surface soil. (1,1,1-trichloroethane may pose a health threat in groundwater, but inclusion in the risk assessment will be based upon Phase 2 RI results.)
Horn Rapids Landfill	Yes	Significant levels of arsenic, chromium, lead, PCBs, tetrachloroethene, trichloroethene, and 1,1,1-trichloroethane were found in soil. Trichloroethane was found in groundwater. (Tetrachloroethene and 1,1,1-trichloroethane may pose groundwater health threats, but inclusion in the risk assessment will be based on Phase 2 RI results.)
Pit 1	No	Pit 1 is an operational gravel pit.
Ephemeral Pool	Yes	Significant levels of PCB and chlordane were found in surface soil.

Definitions:

RI = Remedial Investigation
BEHP = Bis(2-ethylhexyl)phthalate
PCB = Polychlorinated biphenyl

TABLE 2
EXPOSURE MEDIA AND EXPOSURE ROUTES FOR 1100-EM-1
RISK ASSESSMENT RESIDENTIAL SCENARIO

Subunit	Contaminants of Concern	Exposure Medium	Exposure Route IHL	ING	D
Paint and Solvent Pit (1100-2)	Tetrachloroethene	Soil	C		
Antifreeze and Degreaser Pit (1100-3)	Arsenic	Soil	C,S	C,S	C,S
	Chromium	Soil	C	S	S
	Lead	Soil	S	S	
Discolored Soil Site (UN-1100-6)	BEHP	Soil	C	C,S	C,S
	Chlordane	Soil		C,S	C,S
Horn Rapids Landfill	Arsenic	Soil	C,S	C,S	C,S
	Chromium	Soil	C	S	S
	PCB	Soil	C	C	C
	Tetrachloroethene	Soil	C		
	Trichloroethene	Soil	C		
		Groundwater	C	C	
	1,1,1-Trichloroethane	Soil	S		
	Lead	Soil	S	S	
Ephemeral Pool	Chlordane	Soil		C,S	C,S
	PCB	Soil		C	C

Definitions:

IHL = Inhalation
ING = Ingestion
D = Dermal
C = Exhibits carcinogenic effects in exposure route indicated
S = Exhibits systemic noncarcinogenic effects in exposure route indicated
BEHP = Bis(2-ethylhexyl)phthalate
PCB = Polychlorinated biphenyl

REFERENCES

U.S. DOE, August 1990. Phase 1 Remedial Investigation Report for the Hanford Site 1100-EM-1 Operable Unit. U.S. Department of Energy, Richland, WA.

U.S. EPA, December 1989. Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A), Interim Final. EPA/540/1-89/002. U.S. Environmental Protection Agency, Washington, DC.

U.S. EPA, January 1990. Statement of Work RI/FS Risk Assessment Deliverables. U.S. Environmental Protection Agency, Region 10, Seattle, WA.

U.S. EPA, September 1990. Slope Factors for PAHs (American Cross Armory, Chehalis, WA). Memo from Pei-Fung Hurst, Chemical Mixtures Assessment Branch, to Dana Davoli, Environmental Services Division, U.S. Environmental Protection Agency, Region 10, Seattle, WA.

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Author	Addressee	Correspondence No.
DR Einan/USEPA	RK Stewart/DOE-RL	Incoming: 9102439

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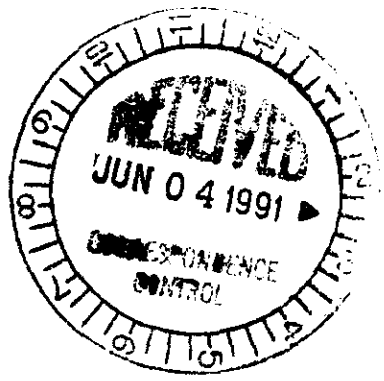

Distribution Corrections: Marian Cram - 6-4123 - A3-01 or cc:Mail