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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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November 10, 1994

Mr. Robert G. Holt  
Acting Hanford Project Manager  
U.S. Department of Energy  
Richland Field Office  
P. O. Box 550  
Richland, WA 99352



Dear Mr. Holt:

Re: 100 NR-1 Qualitative Risk Assessment Document Number BHI-00054, rev. 00

38236

The Washington State Department of Ecology and the Environmental Protection Agency have reviewed the above referenced document and are providing you with our comments. The applicable section precedes the comment and suggested resolution.

Should you or your staff have questions regarding this submittal, please do not hesitate to contact me at (509) 736-3029.

Sincerely,

Phillip R. Staats  
Unit Manager  
Nuclear Waste Program

PS:skr  
Enclosure

cc: Bryan Foley, USDOE ✓  
Pam Innis, USEPA

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## INTRODUCTION

The Washington State Department of Ecology (Ecology) and the Environmental Protection Agency (EPA) have reviewed the Qualitative Risk Assessment for the 100-NR-1 Source Operable Unit Revision 0, (BHI-00054). The document was prepared for the Hanford site by the U.S. Department of Energy (USDOE) and is dated August 1994. The review focused on the report's technical accuracy and completeness. General and specific comments on the report are presented below.

### General Comments

Overall, the human health risk assessment of the 100-NR-1 qualitative risk assessment followed appropriate guidance; no significant deficiencies were noted. However, a number of key figures were omitted, there were some inconsistencies between tables, and errors in risk numbers were found in Section 3.

### Specific Comments

#### Section 1.1, page 1-1, first paragraph

**Deficiency:** The reader is unable to locate the four options for unrestricted land use described as being recommended by the Hanford Future Site Uses Working Group (HFSUWG). The copy of the recommendation, dated November 13, 1992, is available and lists the HFSUWG recommendations as being: 1) Native American Uses, and 2) Clean Enough for Limited Recreation, Commercial Uses and Wildlife. There is no reference to N Reactor's use as a museum or wildlife and recreation uses as separate listings.

**Recommendation:** Please verify the reference document or revise the text to reflect the two recommendations described above.

#### Section 1.1, page 1-2, first paragraph

**Deficiency:** The overall risk from the Hanford site to current offsite residents may, in fact, be  $10^{-4}$  to  $10^{-6}$ , however, to say that 100-NR-1 contributes only a part of any offsite risk and, therefore, currently meets the target range for offsite exposure, may be misleading. The risk associated with 100-NR-1 may be significantly higher, but when viewed as part of the risk associated with the entire site, may be diluted by that inclusion.

**Recommendation:** Please clarify what is meant by the leap of logic stated in this paragraph and specifically state what offsite risk is specifically posed by the unit of concern which is 100-NR-1.

**Table 1-3, page 1T-3**

**Deficiency:** This table presents the human health toxicity factors for radionuclide contaminants. Manganese-54 and cerium-144 are not, but should be included, in this table. Manganese-54 and cerium-144 were detected in the 116-NR-1 soils and were included in the risk tables in Section 3. In addition, slope factors for both of these contaminants are included in EPA guidance (1993).

**Recommendation:** This table should be reviewed to ensure all radioactive contaminants which are evaluated for risk in Section 3 are included.

**Table 2-1**

**Deficiency:** There is not, but should have been, a table presenting the maximum concentrations of radionuclides detected at site 116-N-1, so the risk values in Section 3 can be verified.

**Recommendation:** Please revise the table to include the maximum concentrations of radionuclides detected at site 116-N-1.

**Tables 2-6, 3-14, and 3-15**

**Deficiency:** Table 2-6 presents the maximum detected concentrations of radionuclides at site 1322-N, while Tables 3-14 and 3-15 present the site 1322-N risk assessment summary for 1992 and 2018. The contaminants listed in these three tables are not consistent. These tables should be revised so the contaminants detected (Table 2-6) are the same as those evaluated (Tables 3-14 and 3-15). In addition, Table 2-6, or a new table, should list the radionuclide concentrations used to evaluate sites 116-N-2, 1322-N, and 166-N in year 2018. Without this information, it is difficult to verify the risk numbers shown in Section 3.

**Recommendation:** Please ensure the information presented throughout the document is consistent. Include a new table which lists the radionuclide concentrations for 116-N-1, 1322-N and 166-N in the year 2018.

**Table 3-14, page 3T-14**

**Deficiency:** This table presents the risk estimates for radionuclide contaminants detected at site 1322-N. Based on the reviewer's calculations, the numbers in this table do not appear to be correct and should be recalculated. According to Table 2-6, the concentration used to evaluate cobalt-60 is 7 picocuries per gram (pCi/g). Using USDOE's equations and exposure factors (1994) the external exposure risk is  $1.4E-3$  and the ingestion risk is  $1.4E-7$ ; the risks presented in Table 3-14 are  $1E+2$  for external exposure and  $1E-2$  for ingestion.

**Recommendations:** The risk numbers in this table and the other human health risk tables in Section 3 should be checked to verify their accuracy.