Department of Energy
Washington, DC 20585

December 3, 2008

Dr. Keith I. McConnell, Deputy Director
Decommissioning and Uranium Recovery Licensing Directorate
Division of Waste Management and Environmental Protection
Office of Federal and State Materials and Environmental Management Programs
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Submission of the Phase 1 Decommissioning Plan (DP) for West Valley Demonstration Project (WVDP) for U.S. Nuclear Regulatory Commission (NRC) Review

Dear Dr. McConnell:

The purpose of this letter is to submit the Phase 1 DP for the WVDP for NRC review and comment.

Twenty paper copies of the plan are provided to this end, along with 20 compact disks, each of which contains an electronic copy of the plan and the Residual Radioactive (RESRAD) input and output files associated with the dose modeling described in the plan. Sets of key plan references, mainly site-specific technical reports, are also being provided on compact disks.

Basis for NRC Review of the Plan

The U.S. Department of Energy (DOE) understands that this review will be performed by NRC in a manner consistent with Public Law 96-368, the WVDP Act of 1980, which provides authority for NRC to review and consult with DOE informally on matters related to the project.

Submittal of this plan for the Commission's review is consistent with the 1981 Memorandum of Understanding (MOU) between DOE and NRC on the WVDP (the Project), which states that the Department will prepare a Project DP which will be reviewed by NRC and comments provided to the Department. In a letter dated February 3, 2003, NRC specifically requested that DOE submit a DP for the WVDP portion of the site. DOE agreed to do so in a letter dated February 28, 2003.

Consistent with the MOU and the Act, the Department will review and consider the NRC comments on the plan and provide responses in writing to NRC prior to initiating the Phase 1 decommissioning activities.

Background

Under the provisions of the WVDP Act, New York State has made available to DOE the facilities and high-level radioactive waste at the Western New York Nuclear Center (the Center), which are necessary for completion of the Project. The Center is owned by the New York State Energy Research and Development Authority (NYSERDA), the NRC licensee.

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The Phase 1 DP has been prepared by DOE to fulfill part of its statutory obligations under the WVDP Act, which holds the Department responsible for decontamination and decommissioning of the tanks and other facilities of the Center that were used in connection with the project. Thus, a high-level radioactive waste solidified under the project was stored, facilities used in solidification of high-level radioactive waste, and material and hardware used in connection with this project. Phase 2 of the decommissioning would be accomplished later after completion of additional studies and evaluation using an approach determined to be the most appropriate.

The proposed decommissioning would be accomplished in two phases following a "phased decision-making" approach.

Plan Content

This plan addresses Phase 1 of the decommissioning. After completion of additional studies and evaluations, Phase 2 of the decommissioning would be accomplished using an approach determined to be the most appropriate.

The decommissioning approach described in this plan is based on the preferred alternative in the Revised Draft Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center, which is referred to in the plan as the Decommissioning EIS. Should DOE ultimately decided upon an approach that differs from the current preferred alternative in the Draft Decommissioning EIS, this DP will be revised as necessary to reflect the changes.

The Phase 1 DP describes:

(1) The activities that would take place during this phase of the decommissioning;

(2) The site conditions that would exist at the conclusion of Phase 1; and

(3) The methods that would be used to organize and manage the project, to protect the health and safety of workers and the public, to protect the environment, and to ensure quality in the decommissioning work.

The Phase 1 decommissioning activities include but are not limited to near-term removal actions such as removal of the Main Plant Process Building, the Vitrification Facility, the source area of the North Plateau groundwater plume, and the Wastewater Treatment Facility lagoons, along with certain ancillary buildings, foundations, concrete slabs, and asphalt and gravel pads.

The organization and content of this plan are based on NRC guidance in Volume 1 of NUREG-1757, Consolidated Decommissioning Guidance, Decommissioning Process for Materials Licensee, and agreements made between NRC and DOE on the applicability of this guidance to the Phase 1 plan as described in the NRC summary of the public scoping meeting on the plan held on May 19, 2008. Consistent with these agreements, the plan provides for DOE control of the following aspects of the Phase 1 decommissioning in accordance with the Department's regulations, directives, and technical standards:

- Project management and organization;

- Radiological safety controls and monitoring of workers;
- Environmental monitoring and control; and
- Radioactive waste management.

While this plan provides for removal of certain radioactive facilities and remediation of surface and subsurface soil on portions of the project premises, it does not address license termination, as licensing matters are not within DOE's purview, since DOE is neither the licensee nor the property owner. However the work accomplished under this plan will result in data that can potentially be used by NYSERDA in support of license termination for all or portions of the Center.

Provisions to Facilitate NRC Review

To facilitate NRC staff review, Appendix A to the plan provides a copy of the NRC DP review checklist from Appendix D to NUREG-1757, Volume 1. This checklist has been annotated to reflect the agreements made in the May 19, 2008 meeting. It shows the section number and page number where each applicable topic in the checklist is addressed in the plan.

To also facilitate NRC staff review, each section and appendix of the plan begins with a brief summary of the purpose of that section or appendix, the information it contains, and its relationship to other parts of the plan. Please note that the information on relationships to other parts of the plan is important to the NRC staff review because portions of the plan are interdependent, and some parts cannot be effectively reviewed without consideration of information in the other related parts of the plan.

Given the complexity of the Phase 1 DP and the WVDP site, a briefing on the plan contents may be appropriate before NRC begins its review. DOE can provide such a briefing to NRC staff upon NRC's request.

Dose Modeling Considerations

Section 5 of the plan describes dose modeling for Phase 1 of the decommissioning. This matter is of special interest because of the complexity of the site and the uncertainty about the approach that will be taken in Phase 2 of the decommissioning.

DOE appreciates the efforts of NRC staff in supporting two separate scoping meetings on dose modeling for the Phase 1 Decommissioning Plan, which were held on July 24, 2008 and October 21, 2008. Some of the issues discussed during these meetings go somewhat beyond the matters related to dose modeling that are normally addressed in decommissioning plans as specified in the NUREG-1757 checklist.

To facilitate NRC staff review, a list of these issues, including DOE action items from the October 21 meeting, is enclosed (Attachment 1). This list identifies where in the plan each issue or action item is addressed.

One item not yet completed is the groundwater modeling to predict the effect of engineered barriers to be installed during Phase 1 on groundwater flow velocities and gradients. DOE plans to revise the DP in the spring of 2009 to incorporate radiological

data from additional characterization of subsurface soil in the area of the north plateau groundwater plume. The results of the additional groundwater modeling to determine flow velocities and gradients will be incorporated in that revision, which will be provided to NRC for review.

Please note that two significant changes were made in the dose modeling approach described at the meeting of October 21, 2008. One change involved use of more realistic distribution coefficients in the conceptual models used for developing derived concentration guideline levels for surface soil. The other change involved use of the RESRAD non-dispersion groundwater model, rather than the RESRAD mass balance model, for development of surface soil DCGLs. These changes resulted in somewhat higher derived concentration guideline levels and cleanup goals for uranium radionuclides in surface soil.

For Further Information

Please let us know if NRC needs any additional references or other information for review of the plan. Please refer any questions about this submittal to Moira Maloney of the WVDP staff at (716) 942-4255.

Sincerely,

Cynthia V. Anderson

Cynthia Anderson
Deputy Chief Operations Officer

Enclosures: 1. Attachment 1: Matters of Interest Related to Dose Modeling
2. Phase 1 of the WVDP DP (20 copies with CDs)

cc: B. Diamond, DOE,-HQ, GC-51, w/o enc.
M. J. Letourneau, DOE-HQ EM-11, CLOV, w/enc.
F. Marcinowski, DOE-HQ, EM-10, FORS, w/enc.
I. Triay, DOE-HQ, EM-1, FORS, w/o enc.
L. Camper, NRC, w/o enc.
C. Glen, NRC, w/o enc.
R. Tadesse, NRC, w/o enc.
B. McCrae, DOE-HQ, GC-52, w/o enc.
P. J. Bembia, NYSERDA (6 copies)
Reading Rooms: (w/enc.)
U.S. Dept. of Energy, FOIA Reading Room (DOE-HQ, Room 1E-190)
Hulbert Library, Springville, NY
Ashford Office Complex Public Reading Room (West Valley, NY)

Matters of Interest Related to Dose Modeling Addressed in the Decommissioning Plan

Content[1]	Reference	Section	Page
Demonstrate understanding of how Phase 1 and 2 sources contribute to the peak dose.	NRC 2008a	5.1.3 App D	5-9 D-6
Evaluate erosion of Phase 1 sources for the entire compliance period.	NRC 2008a	Not done[1]	-
Develop realistic scenarios and evaluate less likely, but plausible exposure scenarios.	NRC 2008a	5.2.1	5-20
Justify models to derive DCGLs, use conservative assumptions when uncertainty is great.	NRC 2008a	5.2.1	5-20
Use DEIS information on groundwater analysis and modeling to estimate flow directions and timing from Phase 1 source areas and potential overlap of Phase 1 and 2 sources.	NRC 2008a	App D	D-6
Model subsurface contamination in the saturated zone at the bottom of the excavations.	NRC 2008a	5.2.1	5-22
Consider erosion that would deplete the cover materials, gully intrusion into the lagoons.	NRC 2008a	5.1.4	5-13
Use dose to source factors to account for sediment as a continuing source to groundwater.	NRC 2008a	Not done[2]	-
Model the engineered barrier performance to ensure that there are no unintended impacts, consider how barrier performance and degradation would affect the flow field, and justify any assumptions.	NRC 2008a	Not done[3]	-
Evaluate the sensitivity of model results to parameter values and alternative conceptual models.	NRC 2008a	5.2.4	5-33
Develop site-specific parameter values for those parameters with the most impact on dose or use conservative assumptions.	NRC 2008a	Table 3-19 Table 3-20 Table C-1	3-70 3-76 C-3
As additional data are collected to reduce uncertainty in the source concentrations, revise DCGLs as necessary, and after remediation is complete, use actual data to estimate the potential dose from Phase 1 sources.	NRC 2008a	5.4.2 5.4.5	5-50 5-51
Provide information regarding development of site-specific K_ds for Sr-90 and other constituents.	NRC 2008a	Table 3-20	3-76
NRC would note that while DCGLs derived for streambed sediments will guide remediation of existing streambed contamination, cumulative impacts from future seeps or discharge to surface water from remaining source areas should be considered in deriving DCGLs for these source areas (although dose contributions from surface water exposure pathways may not be limiting). (NRC 1)	NRC 2008b	5.1.6	5-15

[1] No source erosion was considered in the interest of conservatism.

[2] Did not turn out to be practical as explained by DOE at the October 21, 2008 meeting (NRC 2008b).

[3] Long-term durability was not modeled as explained by DOE at the October 21, 2008 meeting (NRC 2008b). However, Appendix D (page D-6) provides qualitative information on the durability of the engineered barriers.

Matters of Interest Related to Dose Modeling Addressed in the Decommissioning Plan

Content[1]	Reference	Section	Page
NRC stated that additional characterization is important for understanding the nature and extent of contamination, and for estimating the relative contribution of radionuclides to dose (radionuclide ratios for DCGL calculations) in non-excavated areas. [DOE also indicated that it planned to characterize the Lavery Till along pilings at the base of excavations below the Main Plant Process Building to verify the potential for vertical migration of contamination to the Kent Recessional Sequence (KRS).]. (NRC 2)	NRC 2008b	7.3.9	7-26
NRC suggested that DOE make comparisons against surface DCGL (or elevated measurement concentration DCGLs) which would be assumed to provide a bounding evaluation of the potential impacts from erosion to help justify its conclusion that the dose impacts associated with erosion are insignificant. Regardless, if DOE does not intend to perform an erosion simulation it should justify its lack of consideration of this scenario (e.g., demonstrate that the subsurface DCGL scenario is more limiting). (NRC 3)	NRC 2008b	5.1.4 5.4.4	5-13 5-50
NRC indicated that it might not be acceptable to use the mean or most likely value for those parameters that have the largest impact on dose in a deterministic analysis (e.g., for parameters such as K_ds that have a large parameter range and uncertainty). (NRC 4)	NRC 2008b	Further evaluation planned[4]	-
Depending on the combination and range of parameter values selected and models employed (e.g., mass balance versus non-dispersion model in RESRAD), key radionuclides and pathways, the results of the sensitivity analysis could be misleading and the full range of uncertainty difficult to determine. Selection of parameter values should be guided by conservative assumptions when uncertainty is large and cannot be reduced. To determine the impact of a particular parameter value on the dose results, DOE must identify key risk drivers and perform a comprehensive sensitivity analysis to ensure that its selection of parameter values in its deterministic analysis errors on the side of conservatism. (NRC 5)	NRC 2008b	Further valuation planned[4]	-
NRC noted that the acute dose to a well driller should also be evaluated. (NRC 6)	NRC 2008b	5.2.1	5-28
Provide information in DP on (a) impact of Phase 1 engineered barriers (e.g., slurry walls) on groundwater flow directions and velocities away from source areas following Phase 1 removal actions; and (b) functionality of the French Drain including discharge locations. While interested in the affect of the engineered barrier systems on the flow field, NRC commented that the risks associated with the	NRC 2008b	App D	D-5

[4] DOE is still evaluating whether the degree of conservatism in input parameters selected for the base case conceptual models is sufficient in all cases. Any changes to the base case models resulting from this evaluation and the associated changes to DCGLs and cleanup goals will be incorporated into Revision 1 of the Phase 1 Decommissioning Plan.

Matters of Interest Related to Dose Modeling Addressed in the Decommissioning Plan

Content[1]	Reference	Section	Page
engineered barriers was expected to be highest during operational activities when there is a potential for early failures to lead to recontamination of excavated areas. (DOE action 1)[5]			
Include a discussion on screening analysis performed or rationale for the list of eighteen "radionuclides of interest" (e.g., page 30 of presentation). (DOE action 2)	NRC 2008b	5.2	5-19
Include sensitivity analyses of plant transport factors (slide 35). (DOE action 3)	NRC 2008b	Table 5-9 Table 5-10 Table 5-11	5-35 5-38 5-40
Discuss the subset of radionuclides of interest that are expected to be the key risk drivers based on preliminary characterization results and dose analysis. These key risk drivers should be the primary consideration in selecting parameter values that have the largest impact on peak dose based on the results of the sensitivity analysis. (DOE action 4)	NRC 2008b	5.2.4	5-35
As the total volume of material and distribution of contamination following an intrusion event (e.g., well drilling scenario) can have a large impact on the peak dose, the DP should discuss in detail the development of the conceptual model for derivation of subsurface soil DCGLs including parameter such as the well diameter, depth, contaminated zone thickness and area (e.g., page 39 of presentation). (DOE action 5)	NRC 2008b	5.2.1	5-23 5-24
DOE should justify lack of consideration of the dose contribution of subsurface contamination at depth (at the top of the Lavery Till) including potential for preferential pathways in the subsurface that may lead to lateral migration to surface water (e.g., through Lavery Till sand) and vertical migration to KRS (e.g., page 42 of presentation). (DOE action 6)	NRC 2008b	5.1.7	5-16
DOE should explain and reconcile any inconsistency with the conceptual model for derivation of streambed DCGLs with the RESRAD conceptual model for contaminant leaching and transport. Any discrepancies between the conceptual models should be discussed and additional pathways or processes not considered in RESRAD that are expected to be operable in the real system should be evaluated and discussed (e.g., flooding, seasonal fluctuations in surface water levels, baseflow, groundwater seeps). (DOE action 7)	NRC 2008b	5.2.1	5-28
DOE should justify why the estimates of dose from the external pathway calculated by RESRAD are representative of the expected dose to the external dose pathway given the geometry of the receptor and stream banks in the real system. DOE should evaluate the sensitivity of changes in the fish bioaccumulation factors to the predicted doses. (DOE action 8)	NRC 2008b	5.2.1 Table 5-11	5-30 5-40

[5] The additional modeling to quantify the effect of engineered barriers on groundwater flow velocities has not yet been completed.

Matters of Interest Related to Dose Modeling Addressed in the Decommissioning Plan

Content[1]	Reference	Section	Page
DOE should evaluate cumulative impacts due to contributions from multiple sources (e.g., commingling of contaminant plumes in groundwater and cumulative impacts of releases to surface water) and either demonstrate: (a) source areas do not overlap in space or time, or (b) the dose contribution from remediated source areas in WMAs 1 and 2 are so low that they would be insignificant relative to dose standards and dose contributions from Phase 2 sources such that Phase 1 activities would not be the limiting factor in demonstrating compliance with radiological criteria for license termination at the end of Phase 2. (DOE action 9)	NRC 2008b	5.1.5	5-14

References

NRC 2008a, *Report of July 24, 2008 Meeting with U.S. Department of Energy to Discuss Dose Modeling Approach for the West Valley Demonstration Project Phase 1 Decommissioning Plan*, U.S. Nuclear Regulatory Commission, Washington, D.C.

NRC 2008b, *Report of October 21, 2008 Meeting with U.S. Department of Energy to Discuss Dose Modeling Approach for the West Valley Demonstration Project Phase 1 Decommissioning Plan*, U.S. Nuclear Regulatory Commission, Washington, D.C.