U.S. Department of Energy

West Valley Demonstration Project

Phase 1 Decommissioning Plan for the West Valley Demonstration Project

Revision 2

December 2009

Prepared by

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The proposed 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 as the Decommissioning EIS. If changes to that document occur during the course of the National Environmental Policy Act process that affect this plan, such as changes to the preferred alternative, or if a different approach is selected in the Record of Decision, this plan will be revised as necessary to reflect the changes.

Note that many of the comments received during the public comment period for the Revised Draft Decommissioning EIS stated that the 30-year time period for making the decision on the approach to Phase 2 of the decommissioning was too long. Therefore, as the agencies consider the public comments, DOE is evaluating the potential to reduce this time period. In recognition of this potential change, this plan acknowledges that the Phase 2 decision could be made within 10 years from the issuance of the Record of Decision and Findings Statement if the Phased Decisionmaking Alternative is selected.

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Record of Revisions

No.	Date	Purpose
0	December 2008	Initial issue for U.S. Nuclear Regulatory Commission review.
1	March 2009	(1) Corrected some page numbers in the Contents. (2) Changed the preliminary, order-of-magnitude dose estimate for Waste Management Area 2 on page ES-19 from approximately 0.1 to approximately 0.05 millirem per year. (3) Added report USGS 2007 in the Section 3 reference list. (4) Incorporated radiological data on subsurface soil from the 2008 background and Process Building area north plateau groundwater plume investigations into Section 4. (5) Replaced Figure 5-3 with a modified figure to more accurately show the Lavery till depth where samples were taken. (6) Revised Table 5-1 to reflect the 2008 radiological data. (7) Corrected values in Table 5-10 and Table 5-11 to be consistent with Table C-1. (8) Revised Section 5.4.4 to show a maximum of 1.3 millirem per year for Waste Management Area 1 and 0.04 mrem per year for Waste management Area 2, clarified basis for estimates. (9) Corrected French drain location on Figure 7-10. (10) Corrected soil data reference on Figure 7-11 and modified the figure to more accurately show the Lavery till depth where samples were taken. (This figure is the same as Figure 5-3.) (11) Added WVNSCO 2004 to Section 7 references. (12) Corrected some values in Table 9-1, 9-2, and 9-3. (13) Changed cited page numbers on pages A-12 and A-13. (14) Incorporated radiological data on subsurface soil from the 2008 background and Process Building area north plateau groundwater plume investigations into Appendix B. (15) Revised Table C-4 to add the 2008 data and to clarify the content. (16) Added Appendix C, Attachment 2 to provide another electronic file (Table C-4B Excel spreadsheet for the preliminary, order-of-magnitude dose estimates). (17) Revised Appendix D to describe additional groundwater modeling using revised STOMP model. Corrected French drain location on Figure D-2. Revision 1 changes appear in a blue font. Vertical lines used in the right margin to identify these changes were removed in Revision 2.

Record of Revisions

No.	Date	Purpose
2	December 2009	Revision 2 incorporates changes made in response to the Requests for Additional Information (RAIs) submitted by the U.S. Nuclear Regulatory Commission (NRC) on May 15, 2009 and includes other changes made in response to comments on the plan submitted by other agencies. DOE specifically identified the changes being incorporated in Revision 2 of the plan in connection with the RAIs in the RAI responses provided to NRC. Revision 2 changes appear in a red font and are marked with vertical lines in the right margin with the following exceptions. Two types of prevalent changes are not so marked: changing “would” to “will” to make the plan appropriately prescriptive and deleting the word “proposed” for the same reason. The three appendices added in Revision 2 (E, F, and G) are not marked either because they are entirely new. Because Revision 2 changes appear in all parts of the plan, each page is identified as Revision 2 to facilitate a complete reissue of the plan, although the contents of some pages are unchanged from Revision 1. Changes of “would” to “will” and deleting the word “proposed” were made in each part of the plan. The following summary identifies other key changes. **Executive Summary.** Added information on DOE onsite presence after Phase 1 and movement of vitrified high-level waste canisters. Provided for optional surface soil remediation during Phase 1 in selected areas. Updated derived concentrations guideline levels (DCGLs) and cleanup goals. Clarified text related to NRC review and underground waste tank status. **Section 1.** Expanded information on Phase 1 studies, changed period for the Phase 2 decision from 30 years to the possibility that the decision could be made within 10 years, provided for NRC review of certain detailed designs, added Waste Management Plan, made several clarifications. **Section 2.** Made minor changes to Table 2-5. Added information to Table 2-17. Made several clarifications. **Section 3.** Updated information on groundwater modeling, geologic interpretation, maximum probable flood, underground waste tank status, the permeable reactive barrier, the Supernatant Treatment System, and historical earthquakes. Made several clarifications. **Section 4.** Provided clarifying information on uranium radionuclide ratios, underground waste tank status. Made minor changes to Tables 4-9 and 4-10 for consistency with other similar tables and made several clarifications. **Section 5.** Revised Table 5-1. Added information on analyses of alternate conceptual models. Renumbered some subsections. Added new Section 5.2.7 on probabilistic uncertainty analysis and new Section 5.2.8 on multi-source analysis. Revised cleanup goals based on results of these analyses. Added information on DOE presence after completion of Phase 1. Added new Figure 5-12 to define where streambed sediment cleanup goals apply.

Record of Revisions

No.	Date	Purpose
2	December 2009	**Section 6.** Added new Section 6.2 on ALARA good practices, new Section 6.3.6 on intergenerational concerns. **Section 7.** Replaced Figures 7-6 and 7-8, added new figures showing filled deep excavations, revised conceptual schedule. Expanded information on mitigative measures. Added information on DOE presence after completion of Phase 1. Provided for optional surface soil remediation during Phase 1 in selected areas. Made other clarifying changes. **Section 8.** Clarified acceptance criteria. Updated some references. **Section 9.** Added new Section 9.4.4 on applying data quality objectives. Added new tables, other information on scan surveys. Expanded information on in-process surveys. Revised text for consistency with contents of Characterization Sample and Analysis Plan and Final Status Survey Plan, deleting some not-applicable information and rearranging other information. Made reference to new Appendix F and Appendix G. **Appendix A.** Changed page numbers to reflect Revision 2 changes. **Appendix B.** Only changed “would” to “will” and omitted “proposed.” **Appendix C.** Made changes to reflect minor changes in the deterministic conceptual models. **Appendix D.** Added information on hydraulic barrier wall design. Provided for providing final designs to NRC for review. Added information on DOE monitoring, maintenance, and security after Phase 1. Incorporated changes in groundwater model. **Appendix E.** Added new appendix on probabilistic uncertainty analysis details. **Appendix F.** Added new appendix on details of subsurface piping and the associated residual radioactivity. **Appendix G.** Added new appendix on the conceptual framework for the Final Status Survey Plan.

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Note that other tables appear in the Appendix C, Attachment 1 electronic files.
A single Table (C-4B) is included in the Appendix C, Attachment 2 electronic files
Additional tables are also included with the Appendix E electronic files.

NOTATION

Acronyms and Abbreviations

AEC	U.S. Atomic Energy Commission
ALARA	as low as reasonably achievable
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
BH	bore hole
CG	cleanup goal
DCGL	derived concentration guideline level
$DCGL_W$	derived concentration guideline level, wide
$DCGL_{EMC}$	derived concentration guideline level, elevated measurement concentration
$DCGL_{scan}$	derived concentration guideline level, scan
DOE	Department of Energy
DQO	data quality objective
DSR	dose/source ratio
E	east
EIS	environmental impact statement
EMC	elevated measurement concentration
EPA	U.S Environmental Protection Agency
F	Fahrenheit
FR	Federal Register
FUSRAP	Formerly Utilized Sites Remedial Action Program
HEPA	high-efficiency particulate air
HLW	high-level waste
ICORS	Interagency Steering Committee on Radiation Standards
K	hydraulic conductivity
K_d	distribution coefficient
KRS	Kent recessional sequence
LLW	low-level waste
LTR	License Termination Rule
LTS	Lavery till sand
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDC	minimum detectable concentration
MMI	Modified Mercalli Intensity
N	north

NOTATION

ND	not detected
NDA	NRC-Licensed Disposal Area
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NPR	New Production Reactor
NRC	Nuclear Regulatory Commission
NFS	Nuclear Fuel Services, Inc.
NYSDEC	New York State Department of Environmental Conservation
NYSERDA	New York State Energy Research and Development Authority
PUREX	plutonium uranium refining by extraction
QA	quality assurance
QC	quality control
qtr	quarter
RCRA	Resource Conservation and Recovery Act
RESRAD	Residual radioactivity [computer code]
RFI	RCRA facility investigation
S&G	sand and gravel
SAIC	Science Applications International Corporation
SB	subsurface soil
SD	stream bank sediment
SDA	State-Licensed Disposal Area
SPDES	State Pollutant Discharge Elimination System
SS	surface soil
THOREX	thorium uranium extraction process
TLD	thermoluminescent dosimeter
ULT	unweathered Lavery till
W	west
WLT	weathered Lavery till
WMA	waste management area
WSMS	Washington Safety Management Solutions
WVDP	West Valley Demonstration Project
WVES	West Valley Environmental Services
WVNSCO	West Valley Nuclear Services Company

NOTATION

Units

Ci	curie
cfm	cubic feet per minute
cm	centimeter
cm^2	centimeter squared
cm^3	centimeter cubed
cpm	counts per minute
dpm	disintegrations per minute
g	gram [mass]
g	acceleration due to gravity [in reference to accelerations]
h	hour
kg	kilogram
km	kilometer
L	liter
m	meter
mCi	millicurie
millirem	0.001 Roentgen equivalent man
mL	milliliter
mrem	millirem
mR	milli Roentgen
µCi	0.000001 curie
µR	micro Roentgen
µrem	micro rem
µL	0.000001 liter
pCi	10^{-12} curie
R	Roentgen
rem	Roentgen equivalent man
s	second
y	year

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