West Valley Demonstration Project

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WEST VALLEY DEMONSTRATION PROJECT
TECHNICAL SAFETY REQUIREMENTS

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LIST OF ACRONYMS & ABBREVIATIONS

AC	Administrative Control
ALARA	As Low As Reasonably Achievable
AMAD	Activity Median Aerodynamic Diameter
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulation
CHBWV	CH2MHILL•B&W West Valley, LLC
DOE	U.S. Department of Energy
DSA	Documented Safety Analysis
EPA	U.S. Environmental Protection Agency
OGC	Off-Gas Cell
PE-Ci	Plutonium-239 Equivalent Curies
PSRs	Process Safety Requirements
R&SC	Radiation and Safety Committee
RHWF	Remote-Handled Waste Facility
SAC	Specific Administrative Controls
SC	Safety Class
SER	Safety Evaluation Report
SS	Safety Significant
SSCs	Structures, Systems, and Components
TRU	Transuranic
TSRs	Technical Safety Requirements
WVDP	West Valley Demonstration Project

1.0 USE AND APPLICATION

1.1 Introduction

The Technical Safety Requirements (TSRs) presented in this document set forth specific requirements in accordance with the mandates contained in 10 CFR 830, *Nuclear Safety Management*, to ensure the safe operation of non-reactor NUCLEAR FACILITIES at the West Valley Demonstration Project (WVDP). The TSRs are based on analyses documented in WVNS-DSA-001, *Documented Safety Analysis for Waste Processing and Support Activities*.

10 CFR 830 states that "The exact form and contents of technical safety requirements will depend on the circumstances of a particular nuclear facility as defined in the documented safety analysis for the nuclear facility."

This document complies with the "content expectations of the appendix to Subpart B of the Nuclear Safety Management rule." In accordance with 10 CFR 830 and Section 5.2.6 of DOE Guide 423.1-1, this document does not require a "Bases Appendix."

1.2 Definitions

Defined terms in the following list appear in capitalized type throughout this document.

APPROVED CONTAINER(S) - containers that satisfy the following requirements: 1) are fabricated from a non-combustible material such as carbon steel, stainless steel, or galvanized steel; 2) have a lid in place with all bolts, snap rings, clips, or other fastening devices in place; and 3) have been procured or have otherwise been determined to be acceptable per an approved Quality Assurance program. The CH2MHILL•B&W West Valley, LLC (CHBWV) Radiation and Safety Committee (R&SC) may also approve other "special containers" as APPROVED CONTAINERS so long as they satisfy the above described requirements.

FACILITY – A FACILITY or FACILITY segment, as identified in Section 3.3.2.2 of WVNS-DSA-001.

IMMEDIATE/IMMEDIATELY – Without delay and as soon as physically possible, yet not with such haste so as to endanger personnel or violate protocol established by applicable WVDP and CHBWV policies, plans, and procedures, unless the situation clearly warrants speedy or rash efforts and/or violation of protocol to prevent significant harm to the health and safety of personnel or major property damage.

LIMITING CONDITIONS FOR OPERATION - the limits that represent the lowest functional capability or performance level of safety structures, systems, and components required for safe operations. (From 10 CFR 830.3)

LIMITING CONTROL SETTINGS - the settings on safety systems that control process variables to prevent exceeding a safety limit. (From 10 CFR 830.3)

NUCLEAR FACILITY(IES) - any facility, system, process, activity, equipment, structure, or grounds with a nuclear hazard categorization of 1, 2, or 3 in accordance with DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*. The hazard category for a given NUCLEAR FACILITY at the WVDP is provided in WVDP-227, *WVDP Facility Identification and Categorization Matrix*.

OPERATING LIMITS - those limits required to ensure the safe operation of a NUCLEAR FACILITY, including LIMITING CONTROL SETTINGS and LIMITING CONDITIONS FOR OPERATION. (From 10 CFR 830.3)

PE-Ci - A means for normalizing the inhalation hazards of the components of a mixture of radionuclides to that of Pu-239 for the purpose of radiological analyses. To obtain this correlation, the 50-year effective whole-body dose commitment or dose conversion factor for a unit intake of each radionuclide is used. For a known radioactivity quantity and radionuclide distribution, the Pu-239 equivalent activity is determined using radionuclide-specific weighting factors. The Pu-239 equivalent activity (AM) is characterized by

$$AM = \sum_{i=1}^{K} \frac{A_i}{WF_i}$$

where K is the number of radionuclides, A_i is the activity of radionuclide i, and WF_i is the PE-Ci weighting factor for radionuclide i. WF_i is further defined as the ratio

$$WF_i = E_o/E_i$$

where E_o (rem/µCi) is the 50-year effective whole-body dose commitment due to the inhalation of Pu-239 particulates with a 1.0 µm activity median aerodynamic diameter (AMAD) and a weekly pulmonary clearance class, and E_i (rem/µCi) is the 50-year effective whole-body dose commitment due to the inhalation of radionuclide (i) particulates with a 1.0 µm AMAD and the pulmonary clearance class resulting in the highest 50-year effective whole-body dose commitment. Weighting factors are obtained from the values of E_o and E_i contained in DOE/EH-0071.

SAFETY CLASS - those structures, systems, or components, including portions of process systems, whose preventive or mitigative function is necessary to limit radioactive hazardous material exposure to the public, as determined from safety analyses. (From 10 CFR 830.3)

SAFETY LIMITS - the limits on process variables associated with those safety class physical barriers, generally passive, that are necessary for the intended facility function and that are required to guard against the uncontrolled release of radioactive materials. (From 10 CFR 830.3)

SAFETY SIGNIFICANT - those structures, systems, and components which are not designated as safety class structures, systems, and components, but whose preventive or mitigative function is a major contributor to defense in depth and/or worker safety as determined from safety analyses. (From 10 CFR 830.3)

SPECIFIC ADMINISTRATIVE CONTROL - Administrative Controls (AC) that are selected to provide preventive and/or mitigative functions for specific potential accident scenarios and which also have safety importance equivalent to engineered controls that would be classified as Safety Class (SC) or Safety Significant (SS) if the engineered controls were available and selected.

SURVEILLANCE REQUIREMENTS - requirements relating to test, calibration, or inspection to ensure that the necessary operability and quality of safety structures, systems, and components and their support systems required for safe operations are maintained, that FACILITY operation is within SAFETY LIMITS, and that LIMITING CONTROL SETTINGS and LIMITING CONDITIONS FOR OPERATION are met. (From 10 CFR 830.3)

TECHNICAL SAFETY REQUIREMENTS (TSRs) - the limits, controls, and related actions that establish the specific parameters and requisite actions for the safe operation of a NUCLEAR FACILITY and include, as appropriate for the work and hazards identified in the documented safety analysis for the FACILITY: SAFETY LIMITS, OPERATING LIMITS, SURVEILLANCE REQUIREMENTS, ADMINISTRATIVE CONTROLS and management controls, use and application provisions, and Design Features, as well as a Bases Appendix. (From 10 CFR 830.3)

TRU WASTE AREA – an area meeting specific criteria that is designated for operations involving TRU waste.

TSR VIOLATION - A TSR VIOLATION occurs as a result of failing to comply with a TSR AC requirement, as specified in Section 5.10.

1.3 Administrative Controls

Administrative Controls (ACs) are the provisions relating to organization and management, procedures, record keeping, assessment, and reporting necessary to ensure safe operation of a FACILITY (from 10 CFR 830.3). NUCLEAR FACILITY-specific ACs are developed based on the hazard and accident analyses contained in WVDP documented safety analyses, and engineering judgment, to ensure the safe operation of a given NUCLEAR FACILITY.

2.0 SAFETY LIMITS AND LIMITING CONTROL SETTINGS

Analyses in WVNS-DSA-001, *Documented Safety Analysis for Waste Processing and Support Activities*, have not identified active SAFETY CLASS or SAFETY SIGNIFICANT equipment associated with operation of WVDP facilities. Therefore there are no SAFETY LIMITS or corresponding LIMITING CONTROL SETTINGS required for NUCLEAR FACILITIES at the WVDP.

3.0 LIMITING CONDITIONS FOR OPERATION

Analyses in WVNS-DSA-001, *Documented Safety Analysis for Waste Processing and Support Activities*, have not identified active SAFETY CLASS or SAFETY SIGNIFICANT equipment associated with operation of WVDP facilities. Therefore there are no LIMITING CONDITIONS FOR OPERATION required for NUCLEAR FACILITIES at the WVDP.

4.0 SURVEILLANCE REQUIREMENTS

There are no LIMITING CONTROL SETTINGS or LIMITING CONDITIONS FOR OPERATION associated with any WVDP systems, structures or components. Therefore, there are no SURVEILLANCE REQUIREMENTS for NUCLEAR FACILITIES at the WVDP.

5.0 ADMINISTRATIVE CONTROLS

5.1 CHBWV Responsibility

The Manager of a NUCLEAR FACILITY SHALL be appointed by the CHBWV General Manager. The appointed NUCLEAR FACILITY Manager SHALL be responsible for the overall safe operation of the NUCLEAR FACILITY. The shift supervisor or equivalent as identified in WVDP-022, *WVDP Emergency Plan*, for a

NUCLEAR FACILITY SHALL be responsible for the local command function, which entails responsibility for the operation and performance of NUCLEAR FACILITY systems, equipment, and personnel during normal and emergency situations.

5.2 CHBWV Organization

The CHBWV organizational structure SHALL be provided in Chapter 17 of WVNS-DSA-001, *Documented Safety Analysis for Waste Processing and Support Activities*. The CHBWV organizational structure may change between annual updates of WVNS-DSA-001. However, such changes SHALL be reflected in the next annual update of WVNS-DSA-001, as appropriate. Chapter 17 of WVNS-DSA-001 SHALL also address liaisons with outside/off-site organizations.

5.3 Procedures

Procedures required to implement the programs listed in Section 5.4 of this document, and procedures required to implement nuclear facility-specific TSR ACs, SHALL be established, reviewed, and approved in accordance with WVDP-257, *WVDP Manual for Preparation, Review, Approval, Distribution and Revision of Controlled Documents*. For nuclear facilities, written procedures that address the following, as a minimum, SHALL be established, implemented, and maintained.

Safety Document Preparation	WV-365, *Preparation of WVDP Safety Documents*
Worker Safety	WV-900, *WVDP Worker Safety Policy*
Radiation Protection	WV-905, *Radiological Protection*
Nuclear Criticality Safety	WV-923, *Nuclear Criticality Safety*
Emergency Response	WVDP-022, *WVDP Emergency Plan*
Quality Assurance	WVDP-111, *Quality Assurance Program*
Fire Protection	WVDP-177, *WVDP Fire Protection Manual*
Performance Based Training	WVDP-126, *Performance Based Training Program Manual Preface*
Maintenance	WVDP-274, *Maintenance Implementation Plan*
Conduct of Operations	WVDP-106, *West Valley Demonstration Project (WVDP) Conduct of Operations Applicability Matrix*
Waste Management	WVDP-019, *Low Level Waste Management Program Plan,* and WVDP-417, *TRU Waste Management Program Plan*

5.4 Programs

5.4.1 Safety Document Preparation Program

The Safety Document Preparation Program SHALL be in accordance with 10 CFR 830, *Nuclear Safety Management*. The Safety Documentation Preparation Program requires that nuclear facilities be evaluated to identify hazards and potential accidents associated with the facilities and process systems, components, equipment, or structures; and to identify design and operational characteristics intended to mitigate these hazards and potential accidents. These hazards and potential accidents are categorized and analyzed with the results documented, as required, in a Documented Safety Analysis (DSA). Furthermore, as required, TECHNICAL SAFETY REQUIREMENTS (based upon the analyses contained in a DSA) SHALL be developed, implemented, and maintained.

WV-365, *Preparation of WVDP Safety Documents*, is the site document for implementing the Safety Documentation Preparation Program. WV-365 also addresses the development of Process Safety Requirements (PSRs). PSRs are "controls imposed upon Project facilities and operations in the interest of health and safety of on-site personnel and facility operators." Criteria given in WV-365 provide the basis for developing PSRs.

5.4.2 Worker Safety Program

The Worker Safety Program SHALL be in accordance with 10 CFR 851, *Worker Safety and Health Program*. The Worker Safety Program requires that business be conducted in a manner to ensure the safety and well-being of employees and subcontractors. In particular, the Program serves to provide guidance such that worker exposures to chemical, physical, and/or biological hazards are maintained within safe levels. WV-900, *WVDP Worker Safety Policy*, is the site document for implementing the Worker Safety Program.

5.4.3 Radiological Protection Program

The Radiological Protection Program SHALL be in accordance with 10 CFR 835, *Occupational Radiation Protection*. The Radiological Protection Program requires that conduct of radiological operations be performed in a manner to ensure the health and safety of all workers and the general public. The Program also requires that radiation exposures to workers and the public, and releases of radioactivity to the environment, be maintained below regulatory limits and that deliberate efforts be taken to further reduce exposures and releases in accordance with a process that seeks to make any such exposures or releases as low as reasonably achievable (ALARA). WV-905, *Radiological Protection*, is the site document for implementing the Radiological Protection Program. The Radiological Protection Program SHALL ensure the following:

- Shielding is provided that is commensurate with a given radiological hazard and anticipated scope(s) of work to ensure doses to workers remain below federally allowed limits.

- Airborne contamination controls are provided via structures, systems, and components (SSCs) to ensure doses to workers remain below federally allowed limits. These controls SHALL include barriers (e.g., structures and filters) and differential pressures between adjacent areas/rooms/cells, as appropriate for a given radiological hazard.
- Personnel protective equipment, such as respirators and anti-contamination clothing, are used in contaminated areas as needed to ensure doses to workers remain below federally allowed limits.
- Area Radiation Monitors, Continuous Air Monitors, Personal Contamination Monitors, friskers, and other radiation detection equipment are provided as appropriate to ensure workers are made aware of radiological conditions.
- ALARA reviews and other activities as appropriate are performed to ensure shielding and contamination control functions are adequately maintained when modifications are made to passive nuclear facility confinement or radiation shielding structures.

5.4.4 Nuclear Criticality Safety Program

The Nuclear Criticality Safety Program SHALL be in accordance with DOE O 420.1B, *Facility Safety*. The Nuclear Criticality Safety Program requires that significant quantities of fissionable materials be processed, stored, transferred, disposed, or handled in such a manner that the probability of an inadvertent criticality is acceptably low, and, to the extent practical, the public, workers, both government and private property, the environment, and operations are protected from damaging effects and undue hazards that may arise from an inadvertent criticality. WV-923, *Nuclear Criticality Safety*, is the site document for implementing the Nuclear Criticality Safety Program.

5.4.5 Emergency Response Program

The Emergency Response Program SHALL be in accordance with DOE O 151.1C, *Comprehensive Emergency Management System*. The Emergency Response Program provides the direction and approach to be used to minimize the impact of any emergency upon the health and safety of workers, the public, and the environment, and to limit loss or damage to the facilities and plant equipment, as appropriate. WVDP-022, *WVDP Emergency Plan*, is the site document for implementing the Emergency Response Program.

5.4.6 Quality Assurance Program

The Quality Assurance Program SHALL be in accordance with 10 CFR 830.121, Subpart A, *Quality Assurance Requirements*, DOE O 414.1D, *Quality Assurance*, and DOE/RW-0333P, *Quality Assurance Requirements and Description*. The Quality Assurance Program provides the framework and criteria for planning, performing, and assessing the effectiveness of all project activities such as design, procurement, construction, and operation of engineered facilities. A graded approach is applied to the quality assurance controls commensurate with: (1) the relative importance to safety, safeguards,

and security; (2) the magnitude of any hazard involved; (3) the life-cycle stage of the facility; (4) the programmatic mission of the facility; (5) the particular characteristics of the facility; and (6) other relevant factors. WVDP-111, *Quality Assurance Program*, is the site document for implementing the Quality Assurance Program.

5.4.7 Fire Protection Program

The Fire Protection Program SHALL be in accordance with DOE O 420.1B, *Facility Safety*. The Fire Protection Program establishes requirements for a comprehensive fire and related hazards protection program for facilities sufficient to minimize the potential for: (1) the occurrence of a fire or related event; (2) a fire that causes an unacceptable on-site or off-site release of hazardous or radiological material that will threaten the health and safety of employees, the public, or the environment; (3) vital DOE programs suffering unacceptable interruptions as a result of fire and related hazards; (4) property losses from a fire and related events exceeding defined limits established by DOE; and (5) critical process controls and formally identified safety class systems being damaged as a result of a fire and related events. WVDP-177, *WVDP Fire Protection Manual*, is the site document for implementing the Fire Protection Program.

5.4.8 Performance Based Training Program

The Performance Based Training Program SHALL be in accordance with DOE O 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*. The Performance Based Training Program establishes requirements to ensure that technical competence in job performance is established, monitored, and maintained. A systematic approach based upon five distinct phases (analysis, design, development, implementation, and evaluation) is used in a graded fashion such that the trainees gain the knowledge and skills to perform their jobs in a reliable, safe, and quality-minded manner. WVDP-126, *Performance Based Training Program Manual Preface*, is the site document for implementing the Performance Based Training Program.

5.4.9 Maintenance Program

The Maintenance Program SHALL be in accordance with DOE O 433.1B, *Maintenance Management Program for DOE Nuclear Facilities*. The Maintenance Program requires that conduct of maintenance be performed in a manner which promotes operational safety, worker health, environmental protection and compliance, property preservation, and cost-effectiveness, while meeting the programmatic mission of ensuring safe, reliable operation of facilities. A graded approach is used such that the magnitude of maintenance resources expended is commensurate with each facility's programmatic importance and potential environmental, safety, and/or health impact. WVDP-274, *Maintenance Implementation Plan*, is the site document for implementing the Maintenance Program.

5.4.10 Conduct of Operations Program

The Conduct of Operations Program SHALL be in accordance with DOE O 422.1, *Conduct of Operations*. The Conduct of Operations Program requires that operations at all facilities are managed, organized, and conducted in a manner to assure an acceptable level of safety. Procedures (in place to control the conduct of operations) and existing and planned programs (important to safe and reliable operations) are reviewed periodically to assess the effectiveness of the management systems. A graded approach is used and documented in an approved Conduct of Operations matrix such that the depth of detail required and the magnitude of resources expended for operations are commensurate with each facility's programmatic importance and potential environmental, safety, and/or health impact. WVDP-106, *West Valley Demonstration Project (WVDP) Conduct of Operations Applicability Matrix*, is the site document for implementing the Conduct of Operations Program. The Conduct of Operations Program SHALL ensure the following:

- Work is accomplished in accordance with documented instruction, procedures, or drawings as appropriate for a given scope of work. Documented instructions, procedures, and drawings are developed, distributed, and revised in accordance with WVDP-257, *WVDP Manual for Preparation, Review, Approval, Distribution and Revision of Controlled Documents*, and EP-5-002, *Administration of Work Instruction Packages*, to support the safety of workers.
- Job hazards analyses are performed during the work planning process for proposed activities prior to the commencement of work. Participation by qualified personnel in various technical disciplines occurs during work planning.

5.4.11 Waste Management Program

The Waste Management Program SHALL be in accordance with DOE O 435.1, *Radioactive Waste Management*. Radioactive waste management activities are systematically planned, documented, executed, and evaluated. Radioactive waste is managed to: (1) protect the public from exposure to radiation from radioactive materials; (2) protect the environment; (3) protect workers; and (4) comply with applicable Federal, State, and local laws and regulations, as well as applicable Executive Orders and DOE directives. WVDP-019, *Low Level Waste Management Program Plan*, is the site document for implementing the Low-Level Waste Management Program. WVDP-417, *TRU Waste Management Program Plan*, is the site document for implementing the TRU Waste Management Program.

5.5 Minimum Operations Shift Complement

WVNS-DSA-001 does not identify any active SAFETY CLASS or SAFETY SIGNIFICANT SSCs that require operator actions to ensure safe operations. Therefore, the minimum operations shift complement for TSR purposes for nuclear facilities at the WVDP is zero.

5.6 Operating Support

A "strict order of call" roster of CHBWV emergency and technical support personnel SHALL exist in an Emergency Response Program procedure that SHALL be readily accessible.

5.7 Facility Staff Qualifications and Training

The staff at each NUCLEAR FACILITY SHALL be trained and qualified in a manner consistent with the Performance Based Training Program, which implements DOE O 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*. Management at each nuclear facility SHALL establish the minimum qualifications for members of staff. Individuals who operate, maintain, provide support to, or supervise activities at a nuclear facility SHALL receive training appropriate for their specific duties. Training standards SHALL be established, implemented, maintained, and documented as part of the Performance Based Training Program.

5.8 Record Keeping

Records supporting implementation of TSRs SHALL be kept for activities at nuclear facilities in a manner that is consistent with the WVDP Records Management System. The Records Management System SHALL comply with the record keeping requirements of DOE O 200.1A, *Information Management Program*; 36 CFR Chapter XII, Subchapter B, *Records Management*; and ASME NQA-1, *Quality Assurance Program Requirements for Nuclear Facilities*. The Records Management System SHALL be outlined in WVDP-262, *WVDP Records Management Program Plan*. Records of staff training, drawing changes, and operating records, including procedures, data sheets, and logbooks SHALL be maintained for the life of a given NUCLEAR FACILITY in accordance with WVDP-262.

5.9 Reviews and Audits

Reviews and audits of NUCLEAR FACILITIES SHALL be performed. As part of the Integrated Safety Management System established at the WVDP, the assessment program SHALL include intra-departmental self-assessments, independent assessments (which are performed by an organization that assesses compliance with requirements that they do not implement), and management assessments. A Radiation and Safety Committee (R&SC) SHALL be established and maintained whose scope, function, and responsibilities SHALL be defined in WV-906, *Radiation and Safety Committee*.

The CHBWV Quality Assurance Department SHALL provide independent assessment of environmental, safety, and health-related programs through its Performance Analysis and Audit and Surveillance Programs.

Procedure(s) SHALL identify the necessary approvals, authorizations, and requirements for performing readiness activities, developing related readiness documentation, and conducting required reviews, verifications, and reporting in accordance with DOE O 425.1D, *Verification of Readiness to Startup or Restart Nuclear Facilities*. CHBWV line management self-assessments SHALL be performed prior to the startup of a new NUCLEAR FACILITY, or restart after a shutdown that was directed by the DOE.

Reviews "performed by facility personnel to ensure that day-to-day activities are conducted in a safe manner" SHALL be performed within the context of the Conduct of Operations Program discussed in Section 5.4.10.

5.10 Deviations from Technical Safety Requirements

A TSR VIOLATION occurs as a result of failing to comply with a TSR AC requirement, with the exception of TSR ACs given in Sections 5.4, 5.7, 5.8, and 5.9. For programmatic ACs addressed in Section 5.4, a failure to establish, implement, and maintain a given program in a manner consistent with the governing Code of Federal Regulations or DOE Order constitutes a TSR VIOLATION. The violation of a procedure that implements a given program is not a TSR VIOLATION. Failure to establish, implement, and maintain facility staff qualifications and training, record keeping, and reviews and audits in a manner consistent with the discussion provided in Sections 5.7, 5.8, and 5.9, respectively, constitutes a TSR VIOLATION. The violation of a procedure related to the implementation of these controls is not a TSR VIOLATION.

The following SHALL be performed if a TSR VIOLATION occurs. (1) The affected NUCLEAR FACILITY(IES) SHALL be placed in a safe and stable configuration. (2) The TSR VIOLATION SHALL be reported in accordance with WVDP-242, *Event Investigation and Reporting Manual*. (3) A recovery plan SHALL be developed that describes the steps that will reinstate compliance with the TSR AC. (4) An Unreviewed Safety Question Determination of the TSR VIOLATION SHALL be developed, if appropriate, to determine if an Unreviewed Safety Question exists. (5) Within as short a time as can be safely accomplished after discovery, return the FACILITY to compliance.

5.11 Specific Administrative Controls

This section establishes non-programmatic ACs that preserve critical assumptions in the Hazard Evaluation given in Chapter 3 of WVNS-DSA-001.

5.11.1 Requirement for Transuranic Waste Containerization

TRU waste not in a TRU waste inventory control area (as identified in Table 9.4-4 of WVNS-DSA-001) SHALL be stored in an APPROVED CONTAINER.

Waste containers listed in Table 9.4-5 of WVNS-DSA-001 SHALL be excluded from this requirement. Process equipment and waste in areas of the Main Plant, Vitrification Facility, and Remote Handled Waste Facility that are outside of inventory control areas identified in Table 9.4-4 SHALL also be excluded from this requirement.

Basis:

The purpose of this requirement is to ensure that the radionuclide inventory in uncontained waste remains below quantities and consequences analyzed in WVNS-DSA-001.

Waste containers identified in Table 9.4-5 are excluded from this requirement due to the form and dispersibility of activity associated with these wastes. Off-Gas Cell (OGC) vessels listed in this table are included in anticipation of future removal of this equipment from the Main Plant Process Building

outside of a waste container. Process equipment and waste in areas of the Main Plant, Vitrification Facility, and RHWF that are outside of inventory control areas identified in Table 9.4-4 are excluded due to the robust nature of these facilities and the fact that releases of contamination from these facilities would be expected to be released at elevations above the ground level, even in the event of loss of active ventilation.

5.11.2 Facility Inventory Control

The maximum amount of activity not in an APPROVED CONTAINER in a TRU waste inventory control area (as identified in Table 9.4-4 of WVNS-DSA-001) SHALL not exceed 1.0 PE Ci.

Basis:

The purpose of this requirement is to ensure that accident-related consequences to receptors of interest remain below those presented in Chapter 3 of WVNS-DSA-001.

5.11.3 TRU Waste Drum Fire Protection

TRU waste drums or drum arrays containing greater than 10 PE-Ci SHALL be protected from spills of flammable/combustible liquids.

Basis:

The purpose of this requirement is to ensure that drums of high activity TRU waste are not exposed to conditions that could achieve a rate of heat rise in the container sufficient to breach the integrity of the container and cause subsequent combustion of the contents. Durable containers, if used to fulfill this requirement, SHALL be capable of serving this function.

5.11.4 TRU Waste Container Physical Protection

TRU waste containing greater than 10 PE-Ci SHALL be protected from impacts with vehicles.

Basis:

The purpose of this requirement is to ensure that the potential for breach of a TRU waste container(s) due to vehicle impact is minimized. Protection from vehicular traffic is judged to provide significant benefit in reducing the frequency of these events. Physical barriers, such as fences, gates, and jersey barriers; durable containers; or storage of waste within a facility SHALL be used to preclude interaction between vehicles and high activity wastes and SHALL be capable of serving this function.

5.11.5 TRU Waste Transportation

TRU waste containing greater than 10 PE-Ci SHALL be in containers that meet the criteria of 5.11.3 and 5.11.4 when transport by diesel-powered forklift is required. Wastes exempted from the requirements of the SAC described in 5.11.1 SHALL also be excluded from the requirements of this SAC.

Basis:

The purpose of this requirement is to reduce the likelihood of a fire involving high activity TRU waste resulting from a forklift accident. This risk is minimized by requiring high activity waste to be transported in durable containers when diesel-fueled forklift use is required. Wastes exempted from this requirement are large, thick-walled metal process components that are internally contaminated, thereby presenting significantly less risk than the combustible materials that this control is intended to protect.

5.11.6 Criteria for TRU WASTE AREA

Operations involving TRU waste that are not conducted in a uniquely-identified hazard category 3 nuclear facility listed in WVDP-227, *WVDP Facility Identification and Categorization Matrix*, SHALL be conducted in a TRU WASTE AREA. A TRU WASTE AREA SHALL conform to the following:

- Operations conducted within the TRU WASTE AREA SHALL comply with the applicable controls of paragraphs 5.11.1 through 5.11.5; AND
- The distance of the TRU WASTE AREA to the Western New York Nuclear Service Center boundary (as indicated in WVDP-065, *Manual for Radiological Assessment of Environmental Releases at the WVDP*) SHALL be greater than or equal to 850 m.

Basis:

The purpose of this requirement is to provide a mechanism for designating an area previously unidentified as a category 2 or 3 nuclear facility as an area in which TRU waste operations may be conducted.

6.0 DESIGN FEATURES

Design features are the features of a NUCLEAR FACILITY that, if altered or modified, would have a significant effect on safe operation. (From 10 CFR 830.3) APPROVED CONTAINERS are design features.

6.1 APPROVED CONTAINERS

APPROVED CONTAINERS are passive design features. APPROVED CONTAINERS provide an important confinement function and serves as a barrier to fire propagation.

7.0 REFERENCES

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WV-900, *WVDP Worker Safety Policy.* (Latest Revision)

WV-905, *Radiological Protection.* (Latest Revision)

WV-906, *Radiation and Safety Committee.* (Latest Revision)

WV-914, *Unreviewed Safety Question Process.* (Latest Revision)

WV-923, *Nuclear Criticality Safety.* (Latest Revision)

WVDP-019, *Low-Level Waste Management Program Plan.* (Latest Revision)

WVDP-022, *WVDP Emergency Plan.* (Latest Revision)

WVDP-065, *Manual for Radiological Assessment of Environmental Releases at the West Valley Demonstration Project.* (Latest Revision)

WVDP-106, West Valley Demonstration Project (WVDP) *Conduct of Operations Applicability Matrix.* (Latest Revision)

WVDP-111, *Quality Assurance Program.* (Latest Revision)

WVDP-126, *Performance Based Training Program Manual Preface.* (Latest Revision)

WVDP-139, *Emergency Management Implementing Procedures.* (Latest Revision)

WVDP-177, *WVDP Fire Protection Manual.* (Latest Revision)

WVDP-227, *WVDP Facility Identification and Categorization Matrix.* (Latest Revision)

WVDP-242, *Event Investigation and Reporting.* (Latest Revision)

WVDP-257, *WVDP Manual for Preparation, Review, Approval, Distribution and Revision of Controlled Documents.* (Latest Revision)

WVDP-262, *WVDP Records Management Program Plan.* (Latest Revision)

WVDP-274, *Maintenance Implementation Plan.* (Latest Revision)

WVDP-417, *TRU Waste Management Program Plan*. (Latest Revision)

WVNS-DSA-001, *Documented Safety Analysis for Waste Processing and Support Activities.* (Latest Revision)

WVDP-SER-001, *Safety Evaluation Report for Waste Processing and Support Activities,* (Latest Revision)

WVDP RECORD OF REVISION

Rev. No.	Description of Changes	Revision on Page(s)	Dated
0	Original Issue per ECN #9896	All	4/26/96
1	Update to reflect cancellation of OSR/GP-12 and issuance of PSR-6; ECN #10130	1	7/15/96
2	Update to reflect cancellation of OSR/GP-11, OSR/GP-17, OSR/GP-18, and TR/GP-19 and issuance of PSR-4 per ECN #10835	1	11/18/97
3	Per ECN 25917, Approval Letter DW:2004:0105, dated March 11, 2004 Added title and cover page to document and deleted Table 1; added Technical Safety Requirements-related information as identified in WVNS-SAR-001, Rev. 9, WVNS-SAR-023, Rev. 1, and WVDP-SER-001, Rev. 2	All	3/15/04
4	Revised document to remove reference to WVNS-SAR-023. Revised definition of APPROVED CONTAINER to change from DOT Strong Tight Container to DOT approved container and DOT Industrial Package IP-1, IP-2, and IP-3. Deleted original sections 5.2.11 and 5.2.12 and created new section 5.2.11 to incorporate specific administrative controls specified in WVNS-SAR-001. NS&EM, USQD Originators, Safety Analysts/Reviewers and Facility Managers are impacted by this change	4,6,7,12, 13,14,15, 17,18,19	06/27/07
5	Updated cover sheet Added terms to List of Acronyms & Abbreviations Added statement clarify SAR as DSA for WVDP Replaced “West Valley Nuclear Services Company” (WVNSCO) with “West Valley Environmental Services” (WVES) Replaced “President of WVNSCO” with “WVES Project Manager” Replaced references to WV-110 (canceled CONOPS procedure) with WVDP-106 (current CONOPS document) Cite 10CFR851 as basis for WVDP Health & Safety Updated to reflect revisions of DOE Orders. ESH&Q, USQD Originators, Safety Analysts/ Reviewers and Facility Managers are impacted by this change.	2 3 3,6,11,12 6 6,10 7,18 8,9,10,18	12/03/08

WVDP RECORD OF REVISION CONTINUATION FORM

Rev. No.	Description of Changes	Revision on Page(s)	Dated
6	Revised document throughout to change references from SAR to DSA and modified section reference to reflect 17 chapter format of DSA.	All 3,4	02/18/10
	Added definitions for CONCRETE ENCLOSURE, FACILITY, IMMEDIATE/IMMEDIATELY, SOLID STEEL DECK PALLET, STAGED/STAGING, and STORED/STORAGE	3	
	Modified QA requirement for APPROVED CONTAINER	14-19	
	Eliminated references to fissile material in Sections 5.11.2 through 5.11.5 and replaced with corresponding amount of activity in units of PE-Ci.	14,15	
	Added compensatory measures to Section 5.11.3 to be followed when handling TRU waste with gas or diesel-powered equipment.	15-17	
	Significantly expanded basis of Section 5.11.3 to clarify components that may serve as an “equivalent barrier;” and to specify performance criteria for spill pigs and SOLID STEEL DECK PALLETS.	18	
	Extended the limit in Section 5.11.5 for the amount of TRU waste that may be IN PROCESS from 7 PE-Ci to 10 PE-Ci based on the results of revised consequence modeling in the DSA. Provided a mechanism for processing wastes containing greater than 10 PE-Ci.	19	
	Deleted RHWF floor, walls, and ceiling as TSR Design Features in Section 6.1 and created new sections 6.2 and 6.3 to identify CONCRETE ENCLOSURES and SOLID STEEL DECK PALLETS as new TSR Design Features.		
	ESH&Q, USQD Originators, Safety Analysts/ Reviewers and Facility Managers are impacted by this change.		
7	Deleted Section 5.11.1 regarding RHWF Waste Acceptance Criteria as it is superfluous in light of the PE-Ci limit established for IN PROCESS TRU waste.	13	09/30/10
	Renumbered remaining sections under Section 5.11, and corrected cross-references accordingly. Minor editorial improvements made elsewhere, and two acronyms deleted.	15-18	
	Added BERMS, BARRIERS, and CONCRETE ENCLOSURES as TSR design features.	19, 20	

WVDP RECORD OF REVISION CONTINUATION FORM

Rev. No.	Description of Changes	Revision on Page(s)	Dated
8	Per ECN 27114		08/25/11
	Deleted definitions for BARRIER, BERM, CONCRETE ENCLOSURE, and DESIGN FEATURE	3	
	Deleted definitions for SOLID STEEL DECK PALLET, STAGED/STAGING, and STORED/STORAGE	5	
	Added WVDP-417, WVDP TRU Waste Management Program Plan	11 13	
	Added instructions in Section 5.10 regarding expectation to restore a facility to compliance following a TSR violation	14	
	Revised introduction to Section 5.11 for Specific Administrative Controls (SAC)	14	
	Revised Section 5.11.1 Specific Administrative Control (SAC) to improve clarity	14	
	Introduced new Section 5.11.2 to split out inventory requirement previously identified under TRU WASTE AREA SAC	14	
	Revised SAC in Section 5.11.3 for TRU waste fire protection to improve clarity and to eliminate discussion of compensatory measures to be taken for waste handling using diesel equipment due to a change in the control philosophy for this activity that eliminates the use of diesel equipment for TRU waste drum handling.	14	
	Introduced SAC in new Section 5.11.4 to prohibit the use of diesel forklifts for TRU waste handling.	14	
	Revised SAC in Section 5.11.5 for TRU waste container storage ARRAY physical protection to improve clarity and to provide a functional requirement for barriers used to protect stored waste.	14	
	Revised SAC in Section 5.11.6 regarding TRU WASTE AREAS to improve clarity, delete the inventory control requirement that is now in Section 5.11.2 as a stand-alone SAC and to clarify the need for a readiness review per WV-368 prior to initiation of operations in the TRU WASTE AREA.	15	
	Deleted reference to BERM, SOLID STEEL DECK PALLET, BARRIER, and CONCRETE ENCLOSURE as TSR Design Features.		
9	Per ECN 30074.		10/31/12
	Revised text to reflect change in site contractor.	All	
	Updated reference to DOE Rules, Orders and Guides throughout	All	
	Added definition for Specific Administrative Control.	4	
	Revised SAC in 5.11.1 to expand list of exempted materials	12	
	Revised SAC basis in 5.11.1 to provide basis for expanding list of materials exempted from SAC requirement.	12	

WVDP RECORD OF REVISION CONTINUATION FORM

Rev. No.	Description of Changes	Revision on Page(s)	Dated
9 (cont.)	Revised SAC in Section 5.11.2 to reduce limit from 10 PE-Ci to 1.0 PE-Ci in order to reduce potential off-site exposures in the event of an accident. Eliminated requirement for DOE approval for processing wastes containing activity greater than this limit.	12	
	Revised SAC in 5.11.3 to provide expectation for capability of durable containers used to protect waste.	13	
	Revised SAC in 5.11.5 to expand list of exempted materials; also revised basis to provide justification	13	
	Deleted requirement for a readiness assessment for the creation of new TRU Waste Areas in 5.11.6	14	
	Engineering, USQD Originators and Facility Managers are affected by this change.		
10	Per ECN 30183		
	Added DOE/RW-0333P to Section 5.4.6	9	
	Revised the title for WVDP-SER-001 in the References	17	
	Engineering and Waste Operations are affected by these changes		