West Valley Demonstration Project

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MAIN PLANT PROCESS BUILDING SAMPLING AND ANALYSIS PLAN

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TABLE OF CONTENTS

**MAIN PLANT PROCESS BUILDING
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1.0 PROJECT MANAGEMENT

1.1 Problem Definition and Background

The decision to demolish the MPPB was made jointly by the DOE and NYSERDA through the NEPA and SEQRA EIS process and is referenced in the 2010 FEIS, April 14, 2010 ROD, and May 12, 2010 Findings Statement.. In accordance with the Phased Decision making Alternative, The MPPB will be demolished to a plant elevation of 100 +/-3 feet under the current DOE contract with CH2M HILL BWXT West Valley, LLC (CHBWV) (see Section 1.3). To support final disposition of the subsurface portion of the MPPB, a Sampling and Analysis Plan and associated required sampling will provide the DOE with results that could be given to prospective future contractors to aid in the disposition of the subsurface MPPB structures in accordance with the EIS preferred alternative and Record of Decision

This Sampling and Analysis plan is designed to only obtain radiological data from the specific areas listed in Appendix B, and is not written to perform all of the data gathering required by the attached DQO in Appendix A. and will not perform any RCRA sampling as outlined in the Appendix A DQO.

1.2 Project Organization and Responsibilities

The key roles and responsibilities of the different departments for this project have been identified in accordance with WVDP-111*, CH2M HILL BWXT West Valley, LLC Quality Assurance Program*, and are defined below:

1.2.1 Facility Disposition & Operations Manager - is responsible for oversight of the collection of samples in accordance with this Sampling and Analysis Plan (Plan).

1.2.2 Regulatory Strategy & Engineering - provides regulatory interface for the project, instruction and oversight of data collection activities, sampling analysis, data reduction/evaluation, and updating this Plan, as appropriate.

1.2.3 Waste Operations Manager - is responsible for the overall site waste operations and management program. The Waste Operations Manager is also responsible for establishing readiness for field activities, providing training, supervision, and resources necessary for the tasks discussed. The manager is also responsible for sample shipment to approved off site laboratories.

1.2.4 Waste Planning & Disposition Manager - is responsible for developing off-site subcontract laboratory statements of work to support site waste management analytical needs. This Manager also coordinates the shipment of related samples to off-site subcontract laboratories for analysis, and for tracking such samples per WM-220. The Waste Planning & Disposition Manager reports directly to the Waste Operations Manager.

1.2.5 Field (Group) Supervisor - is responsible for oversight of field activities, ensuring that workers are properly qualified to perform assigned tasks, and that work proceeds in a safe manner in accordance with approved work documents. The group supervisor is also responsible for collection of field notes and ensuring that samples are collected in accordance with this Plan.

1.2.6 Radiological Control - The Radiological Control Technician (RCT) is responsible for monitoring radiological hazards associated with sampling activities, field screening recovered samples, assisting in daily briefings as necessary, and ensuring that all site radiological requirements are adhered to by all field personnel. Radiological Control will be responsible for providing sample screening results to Waste Planning & Disposition to support sample classification per U.S. Department of Transportation (DOT) shipping requirements.

Radiological Control personnel will also collect and report various field survey measurements recorded per this plan.

1.2.7 Quality Assurance (QA) - is responsible for defining, coordinating, and establishing a QA system, and for ensuring that the resulting program is appropriate to the work scopes and activities being performed. QA also advises and assists senior management in developing and completing the QA program and performs independent assessments of the program to evaluate its adequacy and effective implementation.

1.2.8 Safety - is responsible for overseeing and directing sampling operations relative to Industrial Health and Safety (IH&S) issues.

1.3 Project Description

1.3.1 Decontamination Phase

On June 2011, CHBWV was awarded the West Valley Demonstration Project Facility Disposition Contract. Among other things, this contract states that CHBWV shall deactivate and decontaminate the Main Plant Process Building (MPPB) to reduce radiological risk and prepare the facility for demolition, and perform the demolition to a nominal 100+/-3' elevation (referred to as demolition of the MPPB).

A detailed radiological assessment of the MPPB, as it existed on December 2004, was previously performed by West Valley Nuclear Services Company (WVNSCO) in accordance with WVDP-403, *Characterization Management Plan for the Facility Characterization Project*. WVNSCO performed radiological characterizations that addressed criteria for license termination in accordance with correspondence from the Nuclear Regulatory Commission (NRC). For each area, or combination of areas, in the MPPB a Radioisotope Inventory Report (RIR) was prepared to document the outcome of the investigation. Thirty-three such reports (included in RIR-403-001 through -038) encompass a bounding radiological inventory for the entire MPPB.

During the early phases of the CHBWV contract, additional data was collected to assist in planning and bounding the radiological inventory estimate of the MPPB to assist in defining actual activities that may be completed during the Decontamination Phase.

A draft MPPB demolition plan for the safe and economic demolition of the MPPB will be prepared and submitted to the DOE. This CHBWV Demolition Plan will define, among other things, the general sequence, approach, and key items for the removal of the MPPB in its entirety. To address National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements, U.S. Environmental Protection Agency (EPA) Clean Air Act

Assessment Package (CAP88-PC) modeling is performed to address the impact of potential radiological releases as a result of this demolition activity to the maximally exposed off-site individual. (MEOSI)

1.3.2 Demolition Phase

The Demolition Phase for the CHBWV contract only includes demolition to the 100+/-3' elevation and does not include the removal of the MPPB floors (all cells and areas), subsurface structures, foundation, or the removal of underlying soils.

The starting point for the MPPB Demolition Phase will essentially be the end point of the Decontamination Phase. In addition to the actual removal of the MPPB structure, the MPPB Demolition Phase may include the performance of additional activities such as, but not limited to:

A. Remaining chemical inventory removal (e.g., removal of residual hazardous items that are targeted to be in use until just prior to actual demolition);
B. Containerized waste removal (e.g., high-level waste canisters);
C. Vessel extraction activities (e.g., Liquid Waste Cell (LWC), Uranium Product Cell (UPC); and
D. Characterization (e.g., for waste management, personnel safety).

The targeted end-points for the MPPB Demolition Phase are the removal of the MPPB's Demolition will be to the "plant elevation" of 100+/-3' and does not include removal of the MPPB floors "at a plant elevation of 100 feet",. . As discussed earlier, the Demolition Plan prepared by CHBWV during the Decontamination Phase will be used to encompass the existing contract work scope; however, CHBWV may identify alternate demolition sequences, approaches, and processes.

1.4 Data Quality Objectives for Measurement Data

1.4.1 Data Generation and Utilization

The purpose of this Plan is to identify what and how characterization data will be collected to reflect MPPB conditions existing at the end of the building Demolition Phase. Such data is targeted to be provided to DOE as radiological survey, and raw sample data and will be collected in response to a Request for Proposal (RFP) or other service procurement mechanism. This Plan was prepared consistent with WV-922, *Preparing Sampling and Analysis Plans*. Evaluating and incorporating this data into future documents will be the responsibility of the DOE for future decision making, including:

- Evaluating and identifying suitable waste management techniques
- Based on future identified demolition and waste management methodology
  - Identifying potential Future waste;
  - Incorporating ALARA challenges;
  - Assessing potential mitigative measures (e.g., fugitive emissions);
  - Identifying potential future sampling needs;
  - Evaluating and identifying potential demolition methods and techniques;

- Evaluating waste packaging and processing that may be required for waste generated during below grade demolition; and
- Evaluating offsite waste disposition pathways (including transportation and disposal).

1.4.2 Data Quality Objectives (DQO) for Data Collection

The data to be generated is outlined below. Further discussions of such data are provided in subsequent sections of this Plan.

- Radiological (Isotopic) Distributions
- Dose Rates
- Surface Contamination
- Depth of Radiological Contamination

The current Data Quality Objective is provided in Appendix A, but as stated in the Problem Definition section, this Sampling and Analysis plan only defines the sampling of radionuclides as defined in attachment B and is not all inclusive to the DQO.

1.5 Training and Certification Requirements

1.5.1 Training

In accordance with WV-538, *Employee Indoctrination and Training*, personnel are trained to the correct work methods and controls to assure safe performance and quality of work. Implementing documents containing the policies and principles that guide the training for these work activities include: WVDP-010, *Radiological Controls Manual*; WVDP-099, *Environmental Compliance Manual;* WVDP-111, *CH2M HILL B&W West Valley*, *LLC Quality Assurance Program;* and WVDP-126, *Performance-Based Training Program Manual*.

Field measurement and sampling personnel shall be trained, at a minimum, in the following: Occupational Safety and Health Administration (OSHA) requirements under 29 Code of Federal Regulations (CFR) 1910.120, General Employee Training, Radiation Worker II Training, and Hazardous Waste Operations Training.

1.5.2 Certifications

Not applicable.

1.6 Health and Safety

Given the historical use of the facility, various levels of radiation and radioactive contamination may be present in materials collected during this sampling and analysis effort. Chemical hazards also may be present, but are unlikely. Implementation of Standard Operating Procedures (SOPs), Industrial and Radiological Work Permits (IWPs and RWPs) and other work instruction documents will provide safe working limits to ensure personnel safety and protection of the environment. A hazards analysis of the proposed field work will be prepared in accordance with WV-921, *Hazards Identification and Analysis*. The work instructions and activities are also subject to the requirements of WVDP-010, *WVDP Radiological Control Manual,* and WVDP-163, *WVDP ALARA Program Manual.*

1.7 Documentation and Records

The following forms, data sheets, logs, reports, or any other form of documentation considered to be a record and when generated are to be prepared, maintained, and transferred to Records in accordance with WVDP-262, *WVDP Records Management Plan*, and WVDP-529, *WVDP Records Disposition Plan*. Refer to the CHBWV Master File Plan for further information.

- Sampling and Analysis Plan with attached DQOs statement;
- Work instructions;
- IWPs and RWPs (if applicable);
- Industrial Hygiene and Safety survey data sheets (if applicable);
- Radiological surveys (as applicable);
- Chain-of-custody (COC) forms;
- DOT radioactive screening data;
- Field notes collected during sampling events;
- Laboratory data packages;
- Data validation report(s) (if applicable);
- Data assessment report(s) (if applicable);
- WVDP Issue Reports and Action Reports (if applicable);
- Internal and external surveillance reports (if applicable); and
- Report(s) to management.

2.0 MEASUREMENT AND DATA ACQUISITION

2.1 Sampling Process Design (Experimental Design)

2.1.1 Methodology

The standardized methodology described herein has been developed to maximize the completeness, accuracy, and consistency of the data collection process.

This methodology is composed of standardized, recognizable elements, covering the entire investigation from planning through implementation and documentation.

2.1.2 Planning Process

NOTE *The appendices referenced herein are planning tools and may be modified as new information is encountered during implementation of this plan An acceptable example of this modification would be to change from a smear to a paint sample if layers of paint are encountered upon entry. Any changes cannot modify the original intent of the SAP, or delete a sample without an equivelant data gathering technique*

Data will be generated for the areas of concern identified in Appendix B . Identified are those major areas targeted to remain in the MPPB areas at the end of FY 2019.

For radiological information, these data sources may include:

- Radiological Distribution
  - Existing data (RIR or Post- RIR/pre-decontamination phase data [data generated since issuance of the applicable RIR and the beginning of the Decontamination Phase (2007)];
  - New data, if any, generated from sampling waste (direct or indirect) generated during the Decontamination Phase; and
  - New data, if any, generated from sampling items remaining at the conclusion of the Decontamination Phase.
- Dose Rates
  - Existing data (RIR or Post- RIR/pre-decontamination phase data [data generated since issuance of the applicable RIR and the beginning of the Decontamination Phase (2007)]); and
  - New data, if any, generated from performing dose rate measurements prior to the application of fixative (if applicable) or at the conclusion of the Decontamination Phase.

The items of concern identified in Appendix B have been assigned depth investigation classifications that will guide the quantity and type of data to be collected, etc. Depth investigation 1 has been assigned to those items of concern which have been significantly impacted (contaminated by acidic solutions and/or spills) by radiological operations conducted in the MPPB (such as process cells, etc.), while Depth investigation 4 has been assigned to those items that have not been significantly impacted by radiological operations or which are associated with lined floor areas. Recommended sampling techniques for all depth investigations are presented in Appendix B. Dose investigations will involve, at a minimum, the establishment of an approximate “grid”, or survey location spacing or frequency, on the item’s surface. Within each grid “block” a dose rate will be collected from approximately the midpoint of that block taking into consideration access constraints, As Low As Reasonably Achievable (ALARA) considerations for worker protection, etc.

See below for the potential constraints associated with data collection and the technical approaches associated with data collection, etc.

- Surface Contamination (alpha & beta/gamma) (floors and walls only)

- Existing data
- New data, if any, generated from performing smears prior to the application of fixative/grout (if applicable) and/or at the conclusion of the Decontamination Phase
- The ability to obtain contamination surveys may be constrained by the cell radiological conditions, see Appendix B for expected sample techniques and constraints.

See discussion above relative to assigning field investigation depth investigation to each item of concern identified in Appendix B.

- Depth of Contamination
  - Existing data; and
  - New data generated from "depth of contamination" investigations. As discussed in the technical approach section of this Plan, the MPPB floor surfaces have been divided into several depth investigation depending upon construction and the expected depth of the impacted contamination. Within these groups, data will be collected as outlined in Appendix B.
  - The ability to obtain Depth of contamination surveys may be constrained by the cell radiological conditions, see Appendix B for expected sample techniques and constraints

2.2 Sampling Method Requirements

2.2.1 General Technical Approach for Data Collection

CHBWV shall employ a graded approach to data collection to meet the project data quality objectives. The technical approach for obtaining data will include the rationale for the data collection activities and details of the specific data collection. Data collection planning, or the determination of what, where and how data will be retrieved is an integrative and progressive process. The process is dictated, in part, by the purpose of the Plan and required operational difficulties associated with the data collection methods available. The data collection program will take into consideration: data type and sources, available technologies, expected isotopes, and cells access constraints.

Cells access issues that will be evaluated include:

A. Airborne contamination levels
B. Removable surface contamination levels
C. Dose levels
D. ALARA
E. Physical conditions of the cell
F. Access points

Based on an assessment of access issues, it will be determined if data will be gathered remotely and/or if manned cell entries can occur, etc. Data collection will be conducted pursuant to written work instruction as appropriate.

All work at the WVDP is conducted in accordance with the principles of Integrated Safety Management System (ISMS) and WVDP-241, *Site Specific Health and Safety Plan (HASP)*. Worker safety will be included in written work instruction such as Work Instruction Packages (WIPs) and Standard Operating Procedures (SOPs) or addressed in Industrial Work Permits (IWPs) and Radiological Work Permits (RWPs). These permits describe the worker protection measures that are required to be taken during Plan field activities. A work originator, group supervisor, and/or review group is assigned by the cognizant manager to perform a hazards analysis and to prepare and plan work instructions in accordance with WV-921. These instructions and activities are subject to radiation exposure reduction methods that are specified in WVDP-163 in accordance with 10 CFR 835.

2.2.2 Technical Approaches

The technical approaches for collecting identified data are discussed below. For all approaches, visual techniques will be employed in the cells, as necessary, to determine areas of stains, etc. and to aid in the data collection efforts. The cells configuration/geometries and spatial distribution of measurements and/or samples will be established using a variety of approaches.

Some of the cells contain functional shield windows that allow for the direct visual inspection of the cells. For other cells, visual documentation can be ascertained either remotely (using borescope, Kazoo video camera, etc.) or via a manned entry (use of digital camera, video, etc.).

A. Technical Approach to Determining Isotopic Distribution

If pre-existing RIR or post- RIR/pre-decontamination phase distribution data is not available and/or applicable, data to be generated during the Decontamination Phase may include results from the sampling of waste directly or indirectly associated with the area of concern. For example, if a floor is decontaminated and the floor debris needs to be sampled to determine an applicable distribution for waste management purposes, that distribution may also be applied directly to the remaining floor or indirectly to a floor associated with the sampled debris (e.g., applicability of Head End Cell (HEC) floor debris data to the Miniature Cell (MC) since source of contamination in MC is HEC. If neither existing nor direct/indirect waste characterization data exists, the remaining surface may be sampled. Sampling will be conducted using smears, coupons, etc., as determined by access, and dose rates. Generally, sampling of in-place surfaces will be biased towards visual indications of contamination and/or radiological indicators (smears, dose rates) taking into consideration access constraints, etc.

B. The primary isotopes of concern which will be assessed under this Plan may include all of the following, or a subset: I-129, C-14, Tc-99, U-232, U-233, U-234, U-235, U-238, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Cm-243, and Cm-244, Cs-137 and Sr-90. These are the key radioisotopes necessary for determining general waste types, MEOSI dose, and assessing overall worker safety. These are identified as the 18 Radionuclides of Interest (ROIs) in the Phase 1 Decommissioning Plan for the West Valley Demonstration Project (Revision 2).Technical Approach to Determining Dose Rates

If pre-existing RIR or post- RIR/pre-decontamination phase dose rate data is not available and/or applicable, dose rates will be taken either prior to the application of fixatives and/or grout (where applicable) or after Decontamination Phase activities are completed in the area. The location of where dose rates will be taken, and distance from the source the measurement will be taken, will be determined based on the physical configuration of the area, and access.

In general dose rates and survey information will be based on a 5 point "dice" pattern of each area. In areas where radiological isotopic distribution is not expected to be selective (i.e. areas where floor contamination was intermixed over the years) actual sample media or smears may be composited for a single isotopic distribution. Survey instrumentation used will vary depending upon cells complexity, identified data requirements, cells/vessel access, background radiation levels, availability of key radio- isotopic signatures, etc. Calibration of instrumentation will be per site radiological procedures manuals.

Dose rates will be collected in accordance with RC-RPO-201, *Operation of Dose Rate Survey Meters.*

C. Technical Approach to Determining Gross Alpha and Gross Beta/Gamma Surface Contamination Levels

If existing surface contamination data is not available or applicable, smearable gross alpha and gross beta/gamma per 100 cm^2 data will be collected. (or normalized to 100$cm^{2)}$ The location of where smears will be taken will be determined by Radiological Engineering taking into consideration the access issues discussed above and the criteria identified above for dose rates.

Surface contamination levels will be determined before fixative or grout is applied to the surface of the item of concern and/or at the completion of decontamination activities in that area.

Surface contamination smears will be collected in accordance with RC-RPO-104, *Performing Radiation and Contamination Surveys.*

D. Technical Approach to Determining Depth of Contamination

The depth to which the majority of the contamination resides within a matrix is impacted largely by cell floor design (lined, unlined) and amounts of fixatives or grout previously applied during decontamination activities. Some area's concrete floors/walls have been physically degraded from acid leaks that occurred during Nuclear Fuel Services (NFS) spent fuel reprocessing operations. Concrete surfaces in other areas have been impacted (e.g., contaminated) by other non-acidic liquids. Decontamination Phase activities may have involved the removal of some impacted floor, the grouting of such, etc. These activities either have already taken place or will be conducted to primarily facilitate manned entries to decontaminate the area by reducing dose/contamination and providing a level walking surface and/or to facilitate achievement of the dose rate/surface contamination objectives discussed above.

The MPPB floor surfaces have been divided into four primary depths of contamination investigation groups depending upon surface construction material and the matrix of the impacting contamination. Within these groups, recommended sampling techniques are presented in Appendix B for each area listed.

2.2.3 Uncertainties Associated with Methodology

Any process methodology has uncertainties associated with it whereas due to limited knowledge, it is impossible to exactly describe existing states or future outcomes. Knowledge is limited due, in part, to the inability to capture 100% of existing information and/or take into consideration information that has not yet been identified or generated. Uncertainty contributors, and their layering impact, associated with the above methodology are identified below.

The layers of uncertainty associated with this Plan's methodology originate at the identification of the items of concern that remain after completion of the Decontamination Phase. The primary uncertainty lies in the inadvertent omission of a significant item of concern based on the area-by-area evaluation to be conducted at the end of Decontamination Phase. To reduce this uncertainty, as discussed above, previous efforts to identify items of concern will be taken into consideration (e.g., RIR identified significant curie contributors) along with new evaluations as to the identification of items remaining at the end of the Decontamination Phase which could significantly impact the data utilization goals identified herein.

For the identified items of concern, the second layer of uncertainty is associated with the assessment of activities conducted during the Decontamination Phase. This assessment will determine if, and what, new data needs to be generated under this Plan. The primary uncertainty involves cursory information that results in a conclusion that pre-existing conditions have not been modified as a result of Decontamination Phase activities whereas certain "new" data is not required to be collected under this Plan. In these instances, existing data (e.g., isotopic distributions) will be provided.

For those items of concern where new data is to be collected under this Plan, the third layer of uncertainty involves the collection of new data. The methodology in which this data will be collected is impacted by various conditions as described above. Contributors to data collection uncertainty include physical constraints, the environment, measuring equipment, measuring object, measuring procedure, etc. To reduce this uncertainty, the identification of data collection technical approaches will be conducted on an area-by-area and item-by-item basis, and described in the implementing work documents

2.2.4 Field Data Collection and Quality Assurance

Field data collection will be conducted by qualified, trained personnel.

2.2.5 Dose Rate/Smear Data

Dose rates will be collected in accordance with RC-RPO-104. Surface contamination smears will be collected in accordance with RC-RPO-104.

The results of monitoring for radiation and smears are documented and maintained per 10 CFR 835.703(a) and (b) and DOE STD 1098-99, Articles 751 754. Records will contain sufficient detail to be meaningful after the originator is no longer available. Sketches/photographs will be used to enhance the user's understanding of the building, room, or equipment layout as appropriate. Information to be recorded on a survey sheet is detailed in WVDP-293, *WVDP Radiological Protection Record Keeping and Reporting Program Manual.*

In accordance with WVDP-010, site surveys and smear results are reviewed and signed off by a supervisor to ensure that the survey was conducted and the form completed in accordance with approved site procedures.

Inspection, maintenance, calibration, and preventative maintenance must be performed, as needed, for field instruments and equipment. Any field instruments and equipment used in performing this work effort are inspected and maintained in accordance with WVDP-318, *WVDP Radiological Instrumentation, Calibration, and Maintenance Program Manual.* Radiological Control Instrument Operation and Calibration procedures (RCIOCs) are contained in WVDP-131, *Radiological Control Procedures Manual* and contain specific testing, inspection, maintenance, and calibration procedures for different field instruments and equipment. The RCIOCs will be used in conjunction with WVDP-318. Preventative maintenance will be conducted per the manufacturer's specifications. The achievement of accurate data in the field is addressed through these activities.

2.2.6 Isotopic Distribution Data

Data acquisition will involve nondestructive field measurements, sample collection, and laboratory analysis of samples. The field measurements may be used to support selection of specific sampling locations by providing information of physical and radiological content.

Samples will be collected and analyzed to determine the radionuclide content of the items of concern. The samples will either be grab samples (single point sampling locations), or composite samples (e.g. multiple subsample points collected in different locations on/in an item).

For surface contaminated floors, sampling may involve the collecting of smear samples, and/or other appropriate collection techniques.

For depth samples some combination of core bores, and/or scraping surface materials will be used to collect samples to a depth of the anticipated contamination levels.

Specific work instructions for collecting samples may be provided in work documents issued to the requirements of EP-5-002, *Administration of Work Instruction Packages* or other appropriate procedure (RC-RPO-104). Off-site sample custody is governed by SOP 300-08 and CHBWV-approved laboratory procedures.

Laboratory sample preparation and test methods must conform to applicable DOE, and CHBWV requirements. Sample preparation by off-site analytical laboratories shall be by approved procedures and may entail leaching or complete dissolution of the sample depending on the specific matrix. The exact method of sample preparation is not specified here to allow for judgment/flexibility by laboratory personnel when dealing with complex sample matrices. If the preparation method is unsuccessful in removing all detectable radioactivities from the sample, the laboratory may determine the approximate percentage of activity that remains in the undissolved portion. Choice of the appropriate preparation method will be made by the laboratory at the time of preparation and analysis and will be approved by CHBWV for the off-site laboratory. Off-site laboratory quality control; laboratory testing, inspection, and maintenance of instrumentation and equipment; and instrument calibration and frequency is governed by the requirements of the applicable subcontract between CHBWV and the offsite laboratory.

Modification of standard and prescribed preparation and analysis methods may be necessary due to the radiation/contamination levels on the samples or due to a non-routine sample matrix. These modifications will be documented by the laboratories and approved by CHBWV.

NOTE *Due to the potential extremely high radioactivity of some of the samples, sample size, methods, detection limits, etc. may need to be significantly modified to be handled by the laboratory and provide useful data. Such deviations will be documented in data assessment documentation.*

2.3 Sample Handling and Custody Requirements

The work instruction documents will provide direction for overall sample handling activities. Sample custody and transfer will be in accordance with SOP 300-08, *Container Sampling*. Continuous COC shall be documented.

2.4 Analytical Method Requirements

Laboratory sample preparation and test methods must conform with applicable DOE, and CHBWV requirements. The sample test methods to be used by off-site subcontract laboratories are specified in their respective subcontracts, and preparation methods approved via audits and surveys.

2.5 Quality Control Requirements

Subcontract laboratory quality control is specified in the respective subcontracts and in their Quality Assurance/Quality Control (QA/QC) documents and procedures.

Off-site laboratories should participate in DOE's Mixed Analyte Performance Evaluation Program (MAPEP). QA programs should be consistent with DOE's Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, and/or the National Environmental Laboratory Accreditation Program (NELAP), and/or ASME NQA-1.

Accuracy, precision, interferences, and possible cross-contamination of samples will be determined through analysis of blanks, laboratory control samples, duplicates, and matrix spikes, as applicable.

2.6 Instrument and Equipment Testing, Inspection, and Maintenance Requirements

Inspection, maintenance, and calibration shall be performed, as needed, for laboratory and field instruments and equipment. Preventive maintenance will be conducted in accordance with manufacturers' specifications.

Instrument and equipment testing, inspection, and maintenance requirements for subcontract laboratories are specified in the subcontract laboratories' procedures.

2.7 Instrument Calibration and Frequency

Any field instruments and equipment used in performing this work effort are calibrated and maintained in accordance with WVDP-318. WVDP-131 contains specific testing, inspection, maintenance, and calibration procedures for different field instruments and equipment.

Subcontract laboratories are required by their subcontract to have a program in place that specifies supply and consumable inspection and acceptance requirements as well as specific calibration information for equipment used in the laboratory.

2.8 Inspection and Acceptance Requirements for Supplies and Consumables

Any non-measurement data used in this SAP (i.e., historical data, data from literature, or databases) must be traceable to the source from which it was obtained.

2.9 Data Acquisition Requirements (Non-direct Measurement)

Once field measurements and laboratory analysis data are obtained, they will be managed and controlled in accordance with the applicable procedure or written work instructions. This will ensure that data traceability and custody are maintained. A data package containing appropriate data management documentation will be produced and delivered to the appropriate Facility Disposition personnel.

2.10 Data Management

Plan Implementation Documentation

For each of the MPPB areas, a Plan Implementation "Record" identifying the following will be developed.

- data associated with recommended sampling technique (distributions, dose rates, as stated by area)
- potential depth of contamination associated with floors if noted
- Work documents utilized for sample collection will be referenced for each area.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Assessments and Response Actions

Deficiencies or non-conformances identified during field activities shall be corrected in the field, if possible, or work shall be stopped and the deficiencies addressed. Self-assessments or surveillances may be performed as required by the cognizant work organizations or QA. Corrective actions and follow-up to assessments will be conducted per WVDP-357, *WVDP Issues Reporting Program*.

3.2 Reports to Management

After appropriate resolution of any necessary inquiries regarding data report packages or revisions to controlled documents, the following reports will be issued:

- Radiological Controls survey reports;
- analytical data packages;
- results of self-assessments performed, as applicable; and
- results of surveillances performed, as applicable

4.0 DATA VALIDATION AND USABILITY

4.1 Data Review, Verification, and Validation Requirements

The data quality review of off-site analyses will be performed by the subcontract laboratories.

4.2 Verification and Validation Methods

4.2.1 On-site Requirements

The field measurement data, as applicable, shall be reviewed in accordance with this SAP and on-site procedures. The QC and calibration performance of the field instrumentation shall be verified in accordance with the manufacturer's specifications to ensure accuracy of the measurements. In addition, the documentation of calibration sources, inspections, and certifications shall also be verified.

4.2.2 Off-Site Requirements

Analytical data packages from the off-site subcontract laboratory(ies) will include a case narrative that contains the following information (as applicable):

- COC documentation;
- sample identification and location code;
- date of collection;
- date of extraction or digestion (if applicable);
- percent solids (if applicable);

- dilution factor (if any);
- date of analysis;
- Method Detection Limit (MDL);
- analytical results in proper cellss;
- results for duplicates, method blanks, matrix spike, matrix spike duplicates, surrogate spike amount, and percent recovery (if applicable);
- acceptance criteria for QC samples;
- comments on any peculiarities concerning sample analysis, such as necessary dilutions, matrix interferences, concentration factors, necessary cleanup procedures, miscellaneous problems, etc.;
- cover sheet listing purchase order number, release number, charge number as listed on the COC, laboratory batch ID/project number, date sample received, date of report, laboratory review signatures, and laboratory approval signatures;
- tabular analytical results pages which include site-assigned ID, laboratory ID, and type of analysis (sample, blank, matrix spike, duplicate, repeat, etc.) in the header, uncertainty, and MDL;
- analytical results in scientific format to three significant figures (as applicable);
- table of analytes, sample results, duplicate results, and relative percent differences for duplicate analysis;
- table of analytes, laboratory control sample activities, laboratory control sample aliquots, and laboratory control sample recoveries, where applicable;
- standard raw data, which includes the following (as applicable): calibration, tracer, quality control, matrix spike, carrier standard certificates, and standard preparation data (as applicable); and
- energy, efficiency, and background calibration data (as applicable).

4.3 Reconciliation with Data Quality Objectives

Decisions that determine if the DQOs have been satisfied will be made by DOE during the data assessment process. Once the assessment is complete, one of two conclusions will be made: (1) sufficient usable data are available and decisions can be made regarding the measured parameters (isotopic distributions, dose rates, surface contamination levels, or depth of contamination); or (2) the results are insufficient or inconclusive and additional information and/or sampling and analysis needs to be performed.

The process of evaluating all data used in this Plan will include, but not be limited to the following:

- designated information is complete (survey information is provided; off-site analytical results are traceable to known sample locations, etc.);
- data are of acceptable quality based on available QC information (off-site data packages);
- data are sufficient to address the principal study questions concerning isotopic distributions, dose rates, surface contamination levels, and/or depth of contamination.

4.4 Data Packages

- All Radiological Controls survey reports and analytical data packages developed as a result of this SAP will be transferred to the DOE in hard copy and/or scanned format. Electronic data systems are not provided by contracted labs (LIMS or EQuIS)

5.0 APPENDICES (INCLUDING DQO STATEMENT)

5.1 Appendix A, DQO FROM DOE
5.2 Appendix B, AREAS REMAINING AFTER DEMOLITION - REQUIRED DATA
5.3 Appendix C, ACRONYMS
5.4 Appendix D, REFERENCES

APPENDIX A
DQO FROM DOE

APPENDIX B
AREAS REMAINING AFTER DEMOLITION - REQUIRED DATA

Area	Existing isotopic data sufficient	Depth investigation required	Manned entry to take samples possible (pre-grout)	Recommended sampling techniques
VIT Operating Aisles North	Yes	Depth Investigation 3	Yes	Dose only
VIT Operating Aisles East	Yes	Depth Investigation 3	Yes	Dose only
VIT Operating Aisles West	Yes	Depth Investigation 3	Yes	Dose only
VIT Cell Pit	Yes	Depth Investigation 4	Samples obtained prior to SAP issuance	N/A
VIT Cell Floor	Yes, no significant isotopic change from pit samples	Depth Investigation 4	No	
VIT Tunnels	Yes, no significant isotopic change from pit samples	Depth Investigation 4	Yes	Dose only
Contact Size Reduction Facility (CSRF)	No	Depth Investigation 4	Yes	Dose only
Master Slave Manipulator Shop (MSM N)	No	Depth Investigation	Master Slave Manipulator Shop (MSM N)	None
Pit from original ILDS Vit WMOA	Yes	Depth Investigation 3	Yes	Dose and smears only no isotopic
Head End Ventilation (HEV)	No	Depth Investigation 3	Yes	Scrape floor, media/paint for isotopic and dose
Laundry (LCR)	No	Depth Investigation 3	Yes	Dose only
Utility Room Extension (URE)	No	Depth Investigation 3	Yes	Dose only
Utility Room (UR)	No	Depth Investigation 3	Yes	Dose only
Load In/Load Out (LI/LO) Building	No	Depth Investigation 3	Yes	Dose only
Main Plant Office Building 1st floor	No	Depth Investigation 3	Yes	Dose only
South stairs bottom	No	Depth Investigation 3	Yes	Dose only
Lower Warm Aisle (LWA)	No	Depth Investigation 3	Yes	Dose only

APPENDIX B
AREAS REMAINING AFTER DEMOLITION - REQUIRED DATA

Area	Existing isotopic data sufficient	Depth investigation required	Manned entry to take samples possible (pre-grout)	Recommended sampling techniques
Lower Warm Aisle - Niches	No	Depth Investigation 4	No access to niches	General area Dose only
East stairs bottom	No	Depth Investigation 3	Yes	Dose only
Uranium Load Out (ULO)	No	Depth Investigation 3	Yes	Smears for isotopic and Dose
Product Packaging and Handling Area (PPH)	No	Depth Investigation 3	Yes	Dose only
Equipment Decontamination Room (EDR)	No	Depth Investigation 3	Yes	Dose only
Scrap Removal Room (SRR)	No	Depth Investigation 3	Yes	Scrape floor, media/paint for isotopic and dose
North stairs 1st floor	No	Depth Investigation 3	Yes	Dose only
Manipulator Repair Room (MRR)	No	Depth Investigation 3	Yes	Scrape floor, media/paint for isotopic and dose
Uranium Product Cell (UPC)	No	None	Yes	Smear for isotopic Dose
Cell Access Aisle (CAA)	No	Depth Investigation 3	Yes	Scrape floor, media/paint for isotopic and dose
Ram Equipment Room (RER)	No	Depth Investigation 3	Yes	Scrape floor, media/paint for isotopic and dose
Liquid Waste Cell (LWC)	No	Depth Investigation 4	Yes (except behind criticality wall)	Scrape floor, media/paint for isotopic and dose
LWC behind criticality wall	No	Depth Investigation 4	No	Smears for isotopic, dose
Off Gas Blower Room (OGBR)	No	Depth Investigation 2	Samples obtained prior to Sap Issuance	N/A
Off Gas Cell (OGC)	No	Depth Investigation 1	No (original floor grouted over)	Core to original floor, take sample of any “layers” found and send for isotopic, dose
Shuttle Transport Room (STR)	No	Depth Investigation 3	Yes	Dose only
Mechanical Operating Aisle (MOA)	No	Depth Investigation 3	Yes	Dose only

APPENDIX B
AREAS REMAINING AFTER DEMOLITION - REQUIRED DATA

Area	Existing isotopic data sufficient	Depth investigation required	Manned entry to take samples possible (pre-grout)	Recommended sampling techniques
Process Mechanical Cell (PMC)	No	Depth Investigation 4	No	Dose only
Chemical Process Cell (CPC)	No	Depth Investigation 4	No	Smear for isotopic and dose
Extraction Cell - 1 (XC-1)	No	Depth Investigation 2	Samples obtained prior to SAP Issuance	N/A
Extraction Cell - 2 (XC-2)	No	Depth Investigation 4	Yes	Scrape floor, media/paint for isotopic and dose
Extraction Cell - 3 (XC-3)	No	Depth Investigation 4	Yes	Scrape floor, media/paint for isotopic and dose
Product Purification Cell (PPC) North	No	Depth Investigation 4	Yes	Scrape floor, media/paint for isotopic and dose
Product Purification Cell (PPC) South	No	Depth Investigation 4	Yes	Scrape floor, media/paint for isotopic and dose
GCR	No	Depth Investigation 4 but has plates on floor that would be required to sample below	Yes (but unknown if dose to high beneath temp. shielding)	Scrape floor, media/paint for isotopic and dose
GPC	Yes	Depth Investigation 4	No	Dose only
WRPA	No	Depth investigation 2	Yes	Scrape floor, media/paint for isotopic and dose
GOA	No	none	yes	Dose only
EDR Pit	Yes	none	No	None
sub grade HEV duct	No	none	No	Dose and smear at HEV, dose in GOA
GCRE	No	Depth Investigation 3	Yes	Dose only
Mini Cell	Yes	none	No	None
Mini Cell Air Lock	Yes	none	No	None

APPENDIX B
AREAS REMAINING AFTER DEMOLITION - REQUIRED DATA

Area	Existing isotopic data sufficient	Depth investigation required	Manned entry to take samples possible (pre-grout)	Recommended sampling techniques
FRS - all areas	No	Depth Investigation 3	Yes	Dose, smear, not in Pool
CPC door slot	Isotopic same as EDR	Depth Investigation 3	No	Dose, smear
MOA pits	No	Depth Investigation 3	Yes	Dose, smear
OGBR niches	Yes	none	No	None

Key:

Depth Investigation 1 – Acid Impacted concrete
Depth Investigation 2 – Areas previously grouted covering legacy contamination
Depth Investigation 3 – Non-impacted concrete surfaces only paint layer investigation required
Depth Investigation 4 – Lined floor only paint layer investigation required

NOTE *This table is a planning tool, subject to change based on uncovering additional existing information, newly generated information, encountered conditions. Decontamination phase activities, etc. Any changes will change RFP.*

APPENDIX C
ACRONYMS

ALARA	As Low As Reasonably Achievable
ASTM	American Society for Testing and Materials
CAA	Clean Air Act
CHBWV	CH2M HILL BWXT West Valley, LLC
DOE	U.S. Department of Energy
DQO	Data Quality Objective
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
HASP	Health and Safety Plan
HEC	Head-End Cell
ISMS	Integrated Safety Management System
IWP	Industrial Work Permit
LWC	Liquid Waste Cell
MC	Miniature Cell
MEOSI	Maximally Exposed Off-Site Individual
MPPB	Main Plant Process Building
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFS	Nuclear Fuel Services, Inc.
NRC	U.S. Nuclear Regulatory Commission
RCIOC	Radiological Control Instrument Operation and Calibration
RFP	Request for Proposal
RIR	Radioisotope Inventory Report
RWP	Radiological Work Permit
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
UPC	Uranium Product Cell
WIP	Work Instruction Packages
WVDP	West Valley Demonstration Project
WVNSCO	West Valley Nuclear Services Company

APPENDIX D
REFERENCES

EP-5-002 Administration of Work Instruction Packages

RC-RPO-104 Performing Radiation and Contamination Surveys

RC-RPO-201 Operation of Dose Rate Survey Meters

SOP 300-08 Container Sampling

WM-220 Sample Tracking System

WV-538 Employee Indoctrination and Training

WV-921 Hazards Identification and Analysis

WV-922 Preparing Sampling and Analysis Plans

WVDP-010 WVDP Radiological Controls Manual

WVDP-099 Environmental Compliance Standards Manual

WVDP-111 CH2M HILL BWXT West Valley, LLC Quality Assurance Program

WVDP-126 Performance Based Training Program Manual

WVDP-131 Radiological Control Procedures Manual

WVDP-163 ALARA Program Manual

WVDP-241 Site Specific Health and Safety Plan

WVDP-293 WVDP Radiological Protection Record Keeping and Reporting Program Manual

WVDP-318 Radiological Instrumentation, Calibration, and Maintenance Program Manual

WVDP-357 WVDP Issues Reporting Program

WVDP-403 Characterization Management Plan for the Facility Characterization Project (to include RIR-403-001 through RIR-403-038)

TBD Demolition Plan

10 CFR 835 Occupational Radiation Protection Program

DOE STD 1098-99, Articles 751-754 Radiological Control

U.S. Department of Energy, DOE/EIS-0226, Final Environmental Impact Statement for Decommissioning and/or Long-term Stewardship at the West Valley Demonstration Project and the Western New York Nuclear Service Center, January 2010

U.S. Department of Energy, Record of Decision for the Decommissioning and/or Long-term Stewardship at the West Valley Demonstration Project and the Western New York Nuclear Service Center, April 14, 2010

U.S. Department of Energy, Phase 1 Decommissioning Plan for the West Valley Demonstration Project, Revision 2, December 2009

WVDP RECORD OF REVISION

Rev. No.	Description of Changes	Revision On Page(s)	Dated
0	Original Issue This document will affect the following organizations: Waste Planning and Disposition and High-Hazard Facilities and Site Projects Departments.	All	06/14/16
1	Major Revision Incorporation of DOE comments. This will affect Waste Planning and Disposition and High-Hazard Facilities and Site Projects Departments.	All	11/29/16