RECORD OF TECHNICAL CHANGE

Technical Change No. DOE/NV--1546-ROTC-1 Page 1 of 1

Activity Name Soils – CAU 568: Area 3 Plutonium Dispersion Sites Date October 4, 2016

The following technical changes (including justification) are requested by:

Christy Sloop (Name) CAU Lead (Title)

Description of Change:

Section 1.0, Introduction, Second Paragraph, following the first sentence add:

"Of these release sites, 7 will be clean closed and 13 will be closed in place."

Executive Summary, Table ES-1 and Section 1.1, Table 1-1 for Corrective Action Site (CAS) 03-23-23 San Juan Contamination Area, revise the corrective action from "Clean Closure" to "Closure in Place" in the Corrective Action column for the San Juan Well Head Cover release.

Justification:

Change requested by NDEP in letter dated June 8, 2016, "RE: Approval of Final Corrective Action Plan for Corrective Action Unit (CAU) 568: Area 3 Plutonium Dispersion Sites, Nevada National Security Site, Nevada, *Federal Facility Agreement and Consent Order*."

The revision to Table ES-1 and Table 1-1 is necessary to correct the planned corrective action for the San Juan Well Head Cover, and remain consistent with the text in Section 2.1.1.2, and the last sentence of Section 2.1.2.1.

The task time will be Unchanged by approximately 0 days.

Applicable Activity-Specific Document(s):

Corrective Action Plan for Corrective Action Unit (CAU) 568: Area 3 Plutonium Dispersion Sites, Nevada National Security Site, Nevada. DOE/NV--1546. May 2016

Approved By:

/s/ Tiffany A. Lantow Date 10/4/2016
Activity Lead

/s/ Robert F. Boehlecke Date 10/4/16
FM Operations Manager

/s/ Chris Andres Date 10/5/16
NDEP

Executive Summary

This Corrective Action Plan (CAP) has been prepared for Corrective Action Unit (CAU) 568, Area 3 Plutonium Dispersion Sites, in Area 3 of the Nevada National Security Site, Nevada, in accordance with the *Federal Facility Agreement and Consent Order* (FFACO). The Corrective Action Decision Document (CADD) for CAU 568 identified 20 release sites that require additional corrective action. The 11 corrective action sites (CASs) and their associated release sites are shown in Table ES-1.

Table ES-1
CAU 568 CASs and Associated Release Sites

CAS Number	CAS Name	Release Name	Corrective Action
03-08-04	Soil and Debris Piles	PSM within Soil and Debris Pile	Clean Closure
03-23-19	T-3U Contamination Area	Chavez HCA (DCB)	Closure in Place
03-23-20	Otero Contamination Area	Otero Well Head Cover	Clean Closure
		Subsurface Contamination within Otero SE DCB	Closure in Place
03-23-23	San Juan Contamination Area	San Juan Well Head Cover	Closure in Place
		Subsurface Contamination within San Juan SE DCB	Closure in Place
		Subsurface Contamination within Pascal-C SE DCB	Closure in Place
03-23-30	HCA Soil Pile	Release from Debris	Clean Closure
03-23-31	U-3d Contamination Area	Luna Well Head Cover	Clean Closure
		Pascal-B HCA	Closure in Place
		Subsurface Contamination within Pascal-B SE DCB	Closure in Place
		Subsurface Contamination within Luna SE DCB	Closure in Place
		Subsurface Contamination within Colfax SE DCB	Closure in Place
03-23-32	U-3j Test Release	Subsurface Contamination within Pascal-A SE DCB	Closure in Place
03-23-33	U-3r Contamination Area	Valencia Well Head Cover	Clean Closure
		Subsurface Contamination within Valencia SE DCB	Closure in Place
03-23-34	U-3ay Contamination Area	Subsurface Contamination within Chipmunk SE DCB	Closure in Place
03-26-04	Test-Related Debris	Lead from Broken Lead-Acid Battery	Clean Closure
		Lead from Lead Shot	Clean Closure
03-45-01	Test Surface Releases	Boomer Test Surface Release	Closure in Place

DCB = Default contamination boundary
HCA = High contamination area
PSM = Potential source material
SE = Safety experiment

The purpose of this CAP is to provide the plan for implementation of the recommended corrective action alternatives (CAAs) for CAU 568. Site characterization activities were performed in 2014, and the results are presented in Appendix A of the CAU 568 CADD. The CAAs were recommended in the CADD. The scope of work required to implement the recommended CAAs of closure in place and clean closure at 11 of the 14 CASs includes the following:

- The installation of physical barriers over the nine safety experiment ground zeroes to cover contamination at CASs 03-23-20 (Otero), 03-23-23 (San Juan and Pascal-C), 03-23-31 (Pascal-B, Luna, Colfax), 03-23-32 (Pascal-A), 03-23-33 (Valencia), and 03-23-34 (Chipmunk).
- The characterization and removal of three soil and debris piles at CAS 03-08-04, and one HCA soil pile at CAS 03-23-30.
- The removal of three steel well head covers (PSM) from CASs 03-23-20 (Otero), 03-23-31 (Luna), and 03-23-33 (Valencia).
- The removal of soil and lead PSM from two locations at CAS 03-26-04.
- Implementation of FFACO use restrictions at nine safety experiment ground zeroes at CASs 03-23-20, 03-23-23, 03-23-31, 03-23-32, 03-23-33, and 03-23-34; the steel well head cover at CAS 03-23-23; the areas meeting HCA conditions at CASs 03-23-19 and 03-23-31; and the Boomer crater area at CAS 03-45-01. The FFACO use restriction boundaries will be presented in the CAU 568 closure report.

1.0 Introduction

This Corrective Action Plan (CAP) provides the rationale and supporting information for the implementation of corrective actions at Corrective Action Unit (CAU) 568, Area 3 Plutonium Dispersion Sites, located in Area 3 of the Nevada National Security Site (NNSS), Nevada. This document has been developed in accordance with the *Federal Facility Agreement and Consent Order* (FFACO) (1996, as amended) that was agreed to by the State of Nevada; U.S. Department of Energy (DOE), Environmental Management; U.S. Department of Defense; and DOE, Legacy Management. The NNSS is approximately 65 miles (mi) northwest of Las Vegas, Nevada.

The Corrective Action Decision Document (CADD) for CAU 568 (NNSA/NFO, 2015a) identified 20 release sites that require additional corrective action. Of these release sites, 7 will be clean closed and 13 will be closed in place. The release sites and their associated 11 corrective action sites (CASs) are shown in Table 1-1. Figure 1-1 shows the CASs and releases within the scope of this CAP.

A detailed discussion of the history of this CAU is presented in the *Corrective Action Investigation Plan* (CAIP) *for Corrective Action Unit 568: Area 3 Plutonium Dispersion Sites, Nevada National Security Site, Nevada* (NNSA/NFO, 2014a).

1.1 Purpose

A CAIP was written for this CAU in January 2014, which details the history of the CASs and the criteria for conducting site investigation activities at CAU 568 (NNSA/NFO, 2014a). Following the CAIP, a corrective action investigation (CAI) was conducted that included field inspections, surveys, sampling, and assessment of investigation results. During the CAI, interim corrective actions were conducted that included the removal of PSM; lead items (bricks, sheets, plates, batteries); and a transformer. A CADD was completed for the CAU in 2015 that presented information supporting the selection of corrective action alternatives (CAAs) for CAU 568 (NNSA/NFO, 2015a).

The purpose of this CAP is to present the plan to implement the recommended corrective actions, as specified in Section 4.0 of the CADD.

Table 1-1
CAU 568 CASs and Associated Release Sites

CAS Number	CAS Name	Release Name	Corrective Action
03-08-04	Soil and Debris Piles	PSM within Soil and Debris Pile	Clean Closure
03-23-19	T-3U Contamination Area	Chavez HCA (DCB)	Closure in Place
03-23-20	Otero Contamination Area	Otero Well Head Cover	Clean Closure
		Subsurface Contamination within Otero SE DCB	Closure in Place
03-23-23	San Juan Contamination Area	San Juan Well Head Cover	Closure in Place
		Subsurface Contamination within San Juan SE DCB	Closure in Place
		Subsurface Contamination within Pascal-C SE DCB	Closure in Place
03-23-30	HCA Soil Pile	Release from Debris	Clean Closure
03-23-31	U-3d Contamination Area	Luna Well Head Cover	Clean Closure
		Pascal-B HCA	Closure in Place
		Subsurface Contamination within Pascal-B SE DCB	Closure in Place
		Subsurface Contamination within Luna SE DCB	Closure in Place
		Subsurface Contamination within Colfax SE DCB	Closure in Place
03-23-32	U-3j Test Release	Subsurface Contamination within Pascal-A SE DCB	Closure in Place
03-23-33	U-3r Contamination Area	Valencia Well Head Cover	Clean Closure
		Subsurface Contamination within Valencia SE DCB	Closure in Place
03-23-34	U-3ay Contamination Area	Subsurface Contamination within Chipmunk SE DCB	Closure in Place
03-26-04	Test-Related Debris	Lead from Broken Lead-Acid Battery	Clean Closure
		Lead from Lead Shot	Clean Closure
03-45-01	Test Surface Releases	Boomer Test Surface Release	Closure in Place

DCB = Default contamination boundary
HCA = High contamination area
PSM = Potential source material
SE = Safety experiment

1.2 Scope

Corrective actions include placement of a concrete barrier over surface components of the nine safety experiment ground zeroes (GZs) and one steel well head cover; characterization and removal of one HCA soil pile and three soil and debris piles; removal and disposal of three steel well head covers; removal of soil and PSM at two lead locations; and implementation of use restrictions (URs). Best

Nevada
Environmental
Management
Operations Activity

DOE/NV--1546

National Nuclear Security Administration

Corrective Action Plan for Corrective Action Unit 568: Area 3 Plutonium Dispersion Sites Nevada National Security Site, Nevada

Controlled Copy No.: ___
Revision No.: 0

May 2016

UNCLASSIFIED

/s/ Joseph P. Johnston 04/28/2016
Joseph P. Johnston, Navarro CO Date

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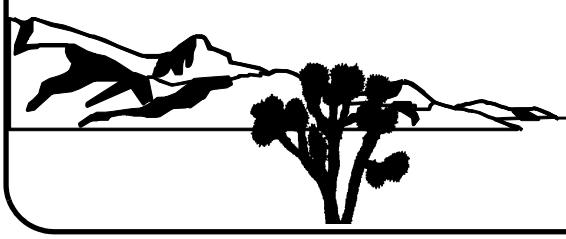

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DOE/NV--1546

CORRECTIVE ACTION PLAN FOR CORRECTIVE ACTION UNIT 568: AREA 3 PLUTONIUM DISPERSION SITES NEVADA NATIONAL SECURITY SITE, NEVADA

U.S. Department of Energy, National Nuclear Security Administration
Nevada Field Office
Las Vegas, Nevada

Controlled Copy No.: ___

Revision No.: 0

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Approved for public release; further dissemination unlimited.

CORRECTIVE ACTION PLAN
FOR CORRECTIVE ACTION UNIT 568:
AREA 3 PLUTONIUM DISPERSION SITES
NEVADA NATIONAL SECURITY SITE, NEVADA

Approved by: /s/ Robert F. Boehlecke Date: 05/04/2016

for Tiffany A. Lantow
Soils Activity Lead

Approved by: /s/ Robert F. Boehlecke Date: 05/04/2016

Robert F. Boehlecke
Environmental Management Operations Manager

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List of Acronyms and Abbreviations

ACI	American Concrete Institute
ASTM	ASTM International
bgs	Below ground surface
CAA	Corrective action alternative
CADD	Corrective action decision document
CAI	Corrective action investigation
CAIP	Corrective action investigation plan
CAP	Corrective action plan
CAS	Corrective action site
CAU	Corrective action unit
CFR	*Code of Federal Regulations*
COC	Contaminant of concern
COPC	Contaminant of potential concern
CR	Closure report
CSM	Conceptual site model
DCB	Default contamination boundary
DOE	U.S. Department of Energy
DQI	Data quality indicator
DQO	Data quality objective
EPA	U.S. Environmental Protection Agency
FAL	Final action level
FFACO	*Federal Facility Agreement and Consent Order*
FIDLER	Field instrument for the detection of low-energy radiation
GZ	Ground zero
HASL	Health and Safety Laboratory
HCA	High contamination area
IDW	Investigation-derived waste
in.	Inch

List of Acronyms and Abbreviations *(Continued)*

LLW	Low-level waste
m	Meter
mi	Mile
mi^2	Square mile
MLLW	Mixed low-level waste
mrem/yr	Millirem per year
N/A	Not applicable
NAD	North American Datum
NDEP	Nevada Division of Environmental Protection
NNSA/NFO	U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office
NNSS	Nevada National Security Site
PPE	Personal protective equipment
psi	Pounds per square inch
PSM	Potential source material
QA	Quality assurance
QAP	Quality Assurance Plan
QC	Quality control
RBCA	Risk-based corrective action
RCRA	*Resource Conservation and Recovery Act*
REOP	Real Estate/Operations Permit
RMA	Radioactive material area
RWP	Radiological work permit
SE	Safety experiment
UR	Use restriction
UTM	Universal Transverse Mercator
yd^2	Square yard
yd^3	Cubic yard

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		Subsurface Contamination within San Juan SE DCB	Closure in Place
		Subsurface Contamination within Pascal-C SE DCB	Closure in Place
03-23-30	HCA Soil Pile	Release from Debris	Clean Closure
03-23-31	U-3d Contamination Area	Luna Well Head Cover	Clean Closure
		Pascal-B HCA	Closure in Place
		Subsurface Contamination within Pascal-B SE DCB	Closure in Place
		Subsurface Contamination within Luna SE DCB	Closure in Place
		Subsurface Contamination within Colfax SE DCB	Closure in Place
03-23-32	U-3j Test Release	Subsurface Contamination within Pascal-A SE DCB	Closure in Place
03-23-33	U-3r Contamination Area	Valencia Well Head Cover	Clean Closure
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- The characterization and removal of three soil and debris piles at CAS 03-08-04, and one HCA soil pile at CAS 03-23-30.

- The removal of three steel well head covers (PSM) from CASs 03-23-20 (Otero), 03-23-31 (Luna), and 03-23-33 (Valencia).

- The removal of soil and lead PSM from two locations at CAS 03-26-04.

- Implementation of FFACO use restrictions at nine safety experiment ground zeroes at CASs 03-23-20, 03-23-23, 03-23-31, 03-23-32, 03-23-33, and 03-23-34; the steel well head cover at CAS 03-23-23; the areas meeting HCA conditions at CASs 03-23-19 and 03-23-31; and the Boomer crater area at CAS 03-45-01. The FFACO use restriction boundaries will be presented in the CAU 568 closure report.

1.0 Introduction

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1.1 Purpose

A CAIP was written for this CAU in January 2014, which details the history of the CASs and the criteria for conducting site investigation activities at CAU 568 (NNSA/NFO, 2014a). Following the CAIP, a corrective action investigation (CAI) was conducted that included field inspections, surveys, sampling, and assessment of investigation results. During the CAI, interim corrective actions were conducted that included the removal of PSM; lead items (bricks, sheets, plates, batteries); and a transformer. A CADD was completed for the CAU in 2015 that presented information supporting the selection of corrective action alternatives (CAAs) for CAU 568 (NNSA/NFO, 2015a).

The purpose of this CAP is to present the plan to implement the recommended corrective actions, as specified in Section 4.0 of the CADD.

Table 1-1
CAU 568 CASs and Associated Release Sites

CAS Number	CAS Name	Release Name	Corrective Action
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03-23-19	T-3U Contamination Area	Chavez HCA (DCB)	Closure in Place
03-23-20	Otero Contamination Area	Otero Well Head Cover	Clean Closure
		Subsurface Contamination within Otero SE DCB	Closure in Place
03-23-23	San Juan Contamination Area	San Juan Well Head Cover	Clean Closure
		Subsurface Contamination within San Juan SE DCB	Closure in Place
		Subsurface Contamination within Pascal-C SE DCB	Closure in Place
03-23-30	HCA Soil Pile	Release from Debris	Clean Closure
03-23-31	U-3d Contamination Area	Luna Well Head Cover	Clean Closure
		Pascal-B HCA	Closure in Place
		Subsurface Contamination within Pascal-B SE DCB	Closure in Place
		Subsurface Contamination within Luna SE DCB	Closure in Place
		Subsurface Contamination within Colfax SE DCB	Closure in Place
03-23-32	U-3j Test Release	Subsurface Contamination within Pascal-A SE DCB	Closure in Place
03-23-33	U-3r Contamination Area	Valencia Well Head Cover	Clean Closure
		Subsurface Contamination within Valencia SE DCB	Closure in Place
03-23-34	U-3ay Contamination Area	Subsurface Contamination within Chipmunk SE DCB	Closure in Place
03-26-04	Test-Related Debris	Lead from Broken Lead-Acid Battery	Clean Closure
		Lead from Lead Shot	Clean Closure
03-45-01	Test Surface Releases	Boomer Test Surface Release	Closure in Place

DCB = Default contamination boundary
HCA = High contamination area
PSM = Potential source material
SE = Safety experiment

1.2 Scope

Corrective actions include placement of a concrete barrier over surface components of the nine safety experiment ground zeroes (GZs) and one steel well head cover; characterization and removal of one HCA soil pile and three soil and debris piles; removal and disposal of three steel well head covers; removal of soil and PSM at two lead locations; and implementation of use restrictions (URs). Best

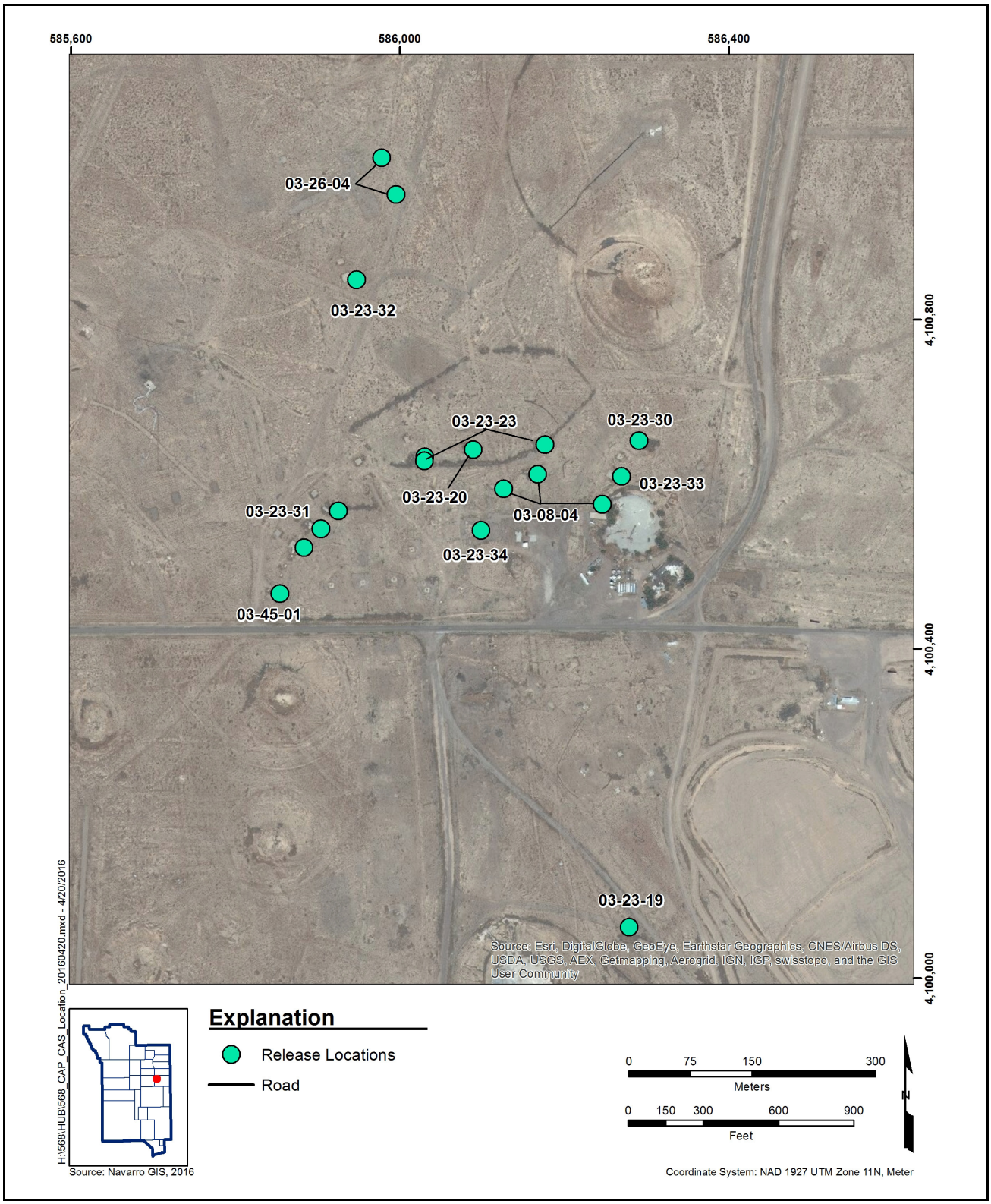

Figure 1-1
CAU 568, CAS Location Map

management practices may also be implemented and will be addressed in the closure report (CR). Table 1-2 presents a summary of the closure activities to be conducted for the CAAs of closure in place or clean closure. Details are presented in Section 2.0. The releases with a recommended CAA of no further action as identified in Section A.10.0 of the CADD (NNSA/NFO, 2015a) are not presented in Table 1-2, as there are no further actions required for these sites.

Table 1-2
CAU 568 Closure Activities
(Page 1 of 3)

CAS	Name	Release	Closure Method	COCs[a]	Scope of Work
03-23-19	T-3U Contamination Area	Chavez HCA (DCB)	Closure in Place	Radiological dose based on HCA conditions	Implement an FFACO UR for the HCA associated with the Chavez test, and post UR warning signs.
03-23-20	Otero Contamination Area	Subsurface Contamination within Otero Safety Experiment Emplacement Hole	Closure in Place	Radiological dose	Construct a barrier over the safety experiment emplacement hole. Implement an FFACO UR, and post UR warning signs.
		Otero Well Head Cover	Clean Closure	None	Remove, package, and dispose of well head cover.
03-23-23	San Juan Contamination Area	San Juan Well Head Cover	Closure in Place	Radiological dose based on HCA conditions	Construct a barrier over the safety experiment emplacement hole and well head cover. Implement an FFACO UR, and post UR warning signs.
		Subsurface Contamination within San Juan Safety Experiment Emplacement Hole	Closure in Place	Radiological dose	
		Subsurface Contamination within Pascal-C Safety Experiment Emplacement Hole	Closure in Place	Radiological dose	Construct a barrier over the safety experiment emplacement hole. Implement an FFACO UR, and post UR warning signs.
03-23-30	HCA Soil Pile	Release from Debris	Clean Closure	Radiological dose based on HCA conditions	Segregate, remove, and dispose of the soil/debris pile. Perform radiological survey and collect confirmation samples.

Table 1-2
CAU 568 Closure Activities
(Page 2 of 3)

CAS	Name	Release	Closure Method	COCs[a]	Scope of Work
03-23-31	U-3d Contamination Area	Pascal-B HCA	Closure in Place	Radiological dose based on HCA conditions	Implement an FFACO UR, and post UR warning signs.
		Subsurface Contamination within Pascal-B Safety Experiment Emplacement Hole	Closure in Place	Radiological dose	Construct a barrier over the safety experiment emplacement hole. Implement an FFACO UR, and post UR warning signs.
		Luna Well Head Cover	Clean Closure	Radiological dose based on HCA conditions	Remove, package, and dispose of well head cover.
		Subsurface Contamination within Luna Safety Experiment Emplacement Hole	Closure in Place	Radiological dose	Construct a barrier over the safety experiment emplacement hole. Implement an FFACO UR, and post UR warning signs.
		Subsurface Contamination within Colfax Safety Experiment Emplacement Hole	Closure in Place	Radiological dose	Construct a barrier over the safety experiment emplacement hole. Implement an FFACO UR, and post UR warning signs.
03-23-32	U-3j Test Release	Subsurface Contamination within Pascal-A Safety Experiment Emplacement Hole	Closure in Place	Radiological dose	Construct a barrier over the safety experiment emplacement hole. Implement an FFACO UR, and post UR warning signs.

Table 1-2
CAU 568 Closure Activities
(Page 3 of 3)

CAS	Name	Release	Closure Method	COCs[a]	Scope of Work
03-23-33	U-3r Contamination Area	Valencia Well Head Cover	Clean Closure	Radiological dose based on HCA conditions	Remove, package, and dispose of well head cover.
		Subsurface Contamination within Valencia Safety Experiment Emplacement Hole	Closure in Place	Radiological dose	Construct a barrier over the safety experiment emplacement hole. Implement an FFACO UR, and post UR warning signs.
03-23-34	U-3ay Contamination Area	Subsurface Contamination within Chipmunk Safety Experiment Emplacement Hole	Closure in Place	Radiological dose	Construct a barrier over the safety experiment emplacement hole. Implement an FFACO UR, and post UR warning signs.
03-08-04	Soil and Debris Piles	PSM within Soil and Debris Pile	Clean Closure	Radiological dose; lead	Segregate, remove, and dispose of the soil/debris piles. Perform radiological survey, and collect confirmation samples.
03-26-04	Test-Related Debris	Lead from Broken Lead-Acid Battery	Clean Closure	Lead	Remove lead PSM, including soil containing PSM; collect confirmation sample.
		Lead from Lead Shot	Clean Closure	Lead	Remove lead PSM, including soil containing PSM; perform visual inspection of PSM removal; collect confirmation samples.
03-45-01	Test Surface Releases	Boomer Test Surface Release	Closure in Place	Radiological dose	Implement an FFACO UR, and post UR warning signs.

[a]A radiological dose COC is the combined dose from radionuclides that exceeds the FAL of 25 mrem/yr.

COC = Contaminant of concern
FAL = Final action level
mrem/yr = Millirem per year

1.3 CAP Contents

This CAP consists of the following sections and appendices:

- Section 1.0, "Introduction," summarizes the purpose, scope, and contents of this CAP.
- Section 2.0, "Detailed Statement of Work," provides a description of the corrective actions approved in the CADD, the construction quality assurance (QA)/quality control (QC) activities to be conducted during the corrective action, waste management activities, and activities to confirm completion of the corrective actions.
- Section 3.0, "Schedule," provides the schedule of major activities for implementing corrective actions.
- Section 4.0, "Post-closure Plan," describes the purpose, frequency, and duration of inspections, monitoring, and maintenance and/or repair activities.
- Section 5.0, "References," provides a list of all referenced documents used in the preparation of this CAP.
- Appendix A, *Engineering Specifications and Drawings,* provides technical drawings needed for construction activities.
- Appendix B, *Sampling and Analysis Plan,* provides the data quality objectives (DQOs), revised conceptual site model (CSM), and the sampling and analysis plan.
- Appendix C, *Activity Organization*, identifies the DOE Soils Activity Lead and other appropriate personnel involved with the CAU 568 characterization and closure activities.
- Appendix D, *Nevada Division of Environmental Protection* (NDEP) *Comments*, contains NDEP comments on the draft version of this document.

All corrective actions were performed in accordance with the following programmatic plans and documents:

- CADD for CAU 568, Area 3 Plutonium Dispersion Sites (NNSA/NFO, 2015a)
- *Soils Risk-Based Corrective Action* (RBCA) *Evaluation Process* (NNSA/NFO, 2014b)
- *Soils Activity Quality Assurance Plan* (QAP) (NNSA/NSO, 2012b)
- FFACO (1996, as amended)

2.0 Detailed Statement of Work

This section presents the detailed statement of work for implementation of the recommended CAAs of closure in place and clean closure that are listed in Table 1-2. Included are summaries of QC requirements and waste management activities.

2.1 Corrective Actions

The CAAs were developed on June 11, 2015, by representatives of NDEP and NNSA/NFO. The CAAs are identified in the CADD (NNSA/NFO, 2015a) and were approved by NDEP.

2.1.1 Closure in Place

2.1.1.1 Chavez Surface Release

CAS 03-23-19 consists of the surface release from the Chavez tower safety experiment. An area near GZ measuring approximately 1,835 square yards (yd^2) exhibits HCA conditions and is assumed to exceed the FAL. As discussed in the CADD (NNSA/NFO, 2015a), an FFACO UR will be implemented for this area. The UR boundary will be established around the corrective action boundary, and UR warning signs will be posted. The FFACO UR will be provided in the CR. Figure 2-1 shows the closure in place boundaries at CAS 03-23-19.

2.1.1.2 Subsurface Contamination within Safety Experiment DCBs

The CAA of closure in place has been selected for the radioactive contaminants released to the subsurface from the following nine shaft safety experiments:

- Otero, CAS 03-23-20
- San Juan, CAS 03-23-23
- Pascal-C, CAS 03-23-23
- Pascal-B, CAS 03-23-31
- Luna, CAS 03-23-31
- Colfax, CAS 03-23-31
- Pascal-A, CAS 03-23-32
- Valencia, CAS 03-23-33
- Chipmunk, CAS 03-23-34

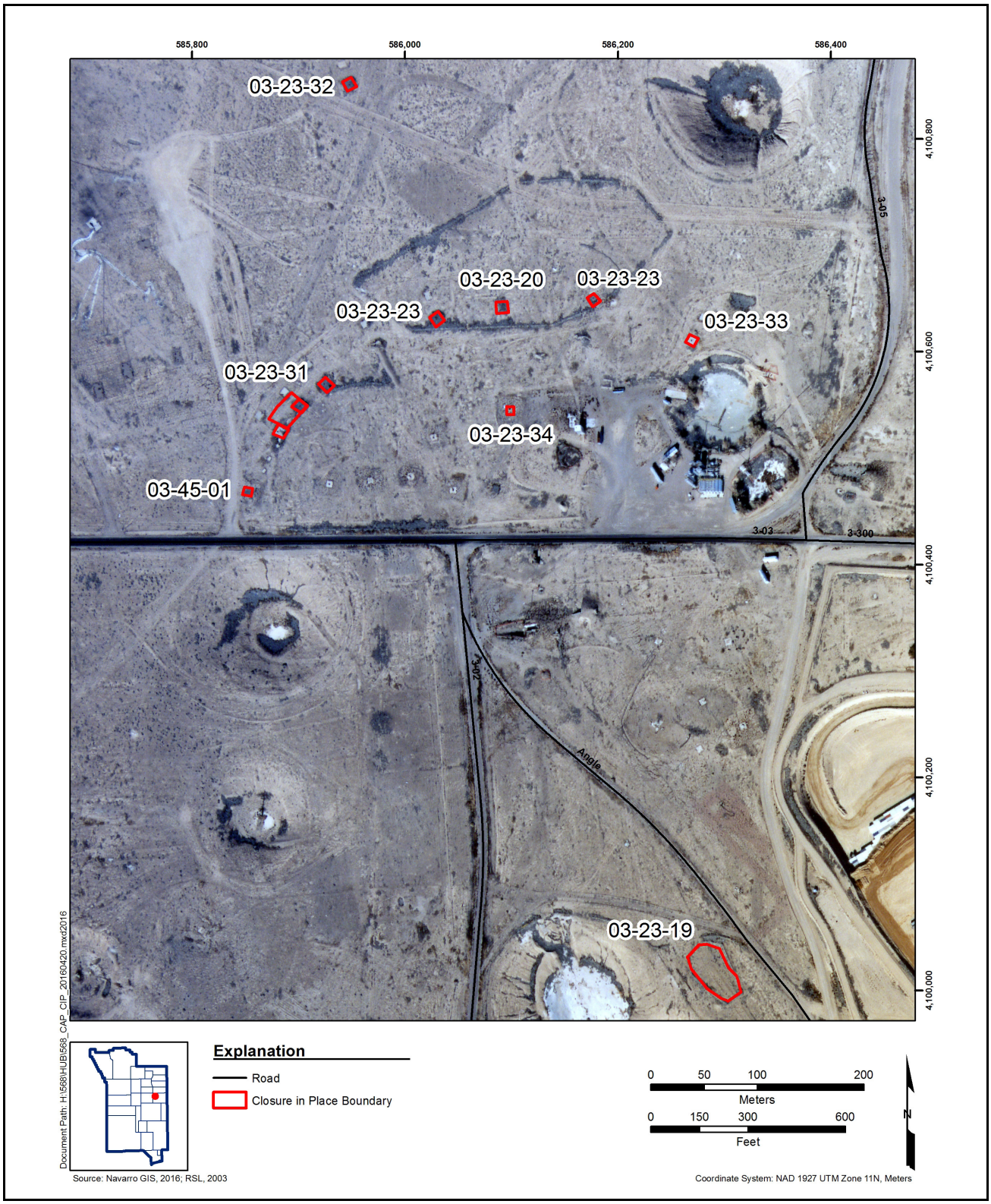

Figure 2-1
CAU 568, Closure in Place Boundaries

Radiological contamination from these safety experiments was identified as requiring corrective action per the CADD (NNSA/NFO, 2015a). Exposure to these contaminants would be possible only through excavation type activities or through degradation of the steel well head assemblies. In order to prevent exposure to contamination within the emplacement holes, the CAA of closure in place includes the following:

- Covering all exposed sections of the well head assembly components with concrete.
- Installing UR signs.
- Performing long-term maintenance of the concrete barrier and signage.

URs will be implemented to provide protection from exposure to remaining contamination within the safety experiment DCBs (i.e., within the boreholes and beneath the surface by preventing excavation activities).

Figure 2-1 shows the closure in place boundary for each of the CASs that will be closed in place. Figures A.2-1 through A.2-3 illustrate examples for the placement of concrete barriers over the well head assemblies. The exposed well head assembly at each emplacement hole will be covered with a minimum of 6 inches (in.) of concrete per the specifications in Appendix A. At CAS 03-23-23 (San Juan), a concrete barrier will also be placed over the steel well head cover adjacent to the emplacement hole (Figure 2-2). As-built construction details prepared by NNSA/NFO or an NNSA/NFO-approved contractor showing the chosen closure in place design for each of the nine safety experiment well head assemblies will be documented in the CR for CAU 568.

2.1.1.3 Pascal-B Surface Release

The surface release from the Pascal-B shaft safety experiment is included within the scope of CAS 03-23-31. An area of soil contamination near GZ consisting of approximately 717 yd^2 exhibits HCA conditions and is assumed to exceed the FAL. As discussed in the CADD (NNSA/NFO, 2015a), an FFACO UR will be implemented for this area, and UR signs will be posted. The FFACO UR will be provided in the CR. The UR boundary is shown in Figure 2-1.

2.1.1.4 Boomer Test Release

The release from the Boomer weapons-related shaft test is included within the scope of CAS 03-45-01. As explained in the CADD (NNSA/NFO, 2015a), the contamination within the

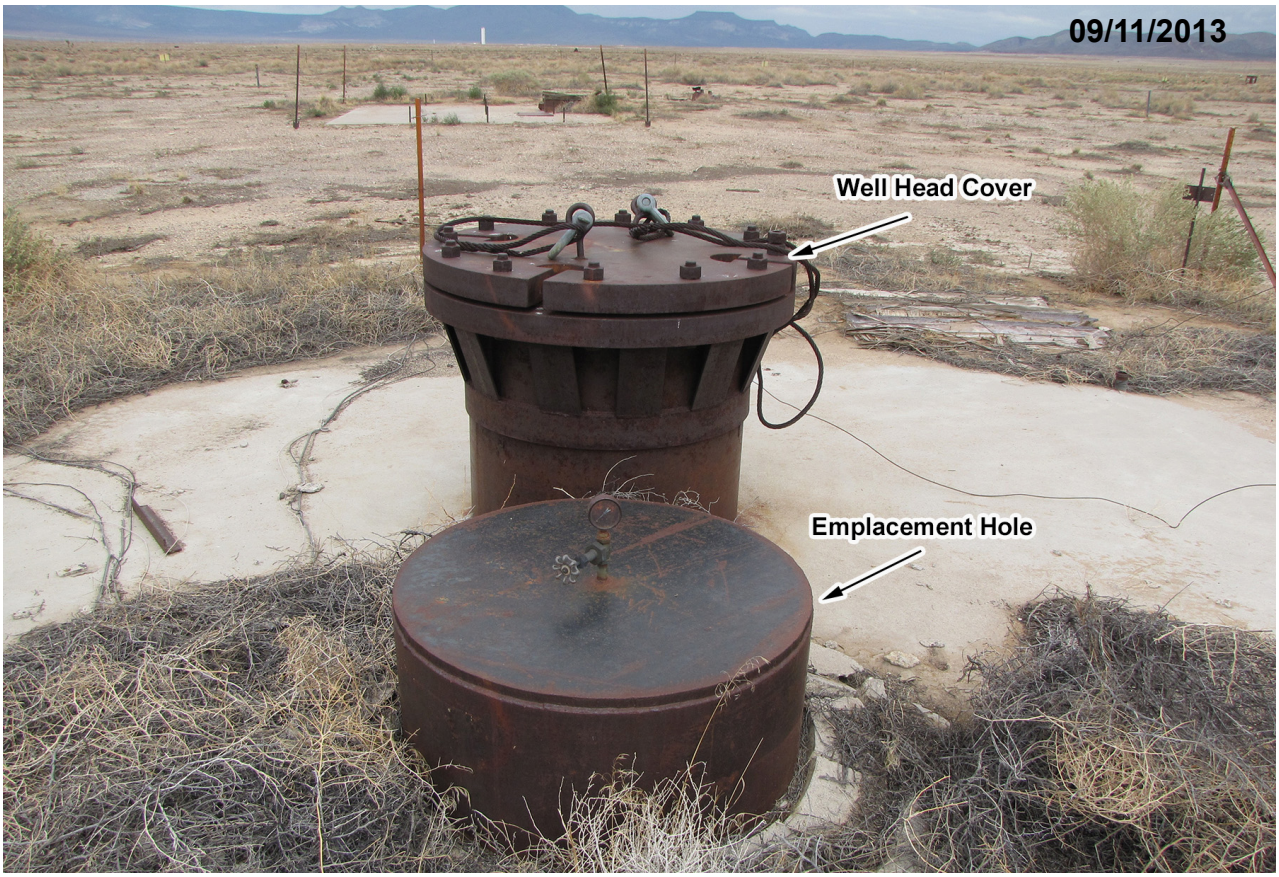

Figure 2-2
CAU 568, San Juan Well Head Cover and Emplacement Hole

Boomer crater area requires corrective action as the crater is unsafe to enter and is assumed to exceed the FAL. Therefore, this release will be closed in place with an FFACO UR, and UR warning signs will be posted. The Boomer crater area measures 44 yd^2, and this closure in place boundary is shown on Figure 2-1. The FFACO UR will be provided in the CR.

2.1.2 Clean Closure

2.1.2.1 Well Head Covers

Four steel well head covers are present at CAU 568. Removable contamination meeting HCA conditions are present on the well head covers as discussed in the CADD (NNSA/NFO, 2015a). Clean closure of three of these well head covers associated with the testing at the Otero

(CAS 03-23-20), Luna (CAS 03-23-31), and Valencia (CAS 03-23-33) shaft safety experiments consists of the removal and disposal of the covers. The well head covers for Otero (CAS 03-23-20), Luna (CAS 03-23-31), and Valencia (CAS 03-23-33) are shown in Figures 2-3, 2-4, and 2-5, respectively.

Figure 2-3
CAU 568, CAS 03-23-20 Otero

The well head cover associated with testing at San Juan (CAS 03-23-23) will be closed in place as discussed in Section 2.1.1.2 (Figure 2-2).

2.1.2.2 Soil and Debris Piles

CAS 03-23-30 consists of a soil pile containing metallic debris (Figure 2-6) on the ground surface. The soil pile exhibits HCA conditions, and is assumed to exceed the FAL (NNSA/NFO, 2015a). CAS 03-08-04 consists of three surface piles containing soil and construction debris (Figure 2-7). Lead items removed from the surface of these piles under an interim corrective action indicate the potential for lead as a PSM to also be present within the piles.

Figure 2-4
CAU 568, CAS 03-23-31 Luna

Figure 2-5
CAU 568, CAS 03-23-33 Valencia

Clean closure, as defined in the CADD, consists of removal of the soil piles, segregation and disposal of any identified PSM, and disposal of the soil and debris. The anticipated waste type for these piles is low-level waste (LLW). If lead or other PSM is identified (e.g., mixed low-level waste [MLLW], hazardous waste), it will be managed and dispositioned in accordance with the applicable requirements. A visual inspection will be conducted to ensure the debris and soil associated with the piles has been removed. After the initial removal of the piles, a field instrument for the detection of low-energy radiation (FIDLER) survey will be conducted of the soil underneath the location where the soil piles/debris were removed. The FIDLER survey will be used to determine whether additional removal is needed to ensure that remaining contamination will be less than FALs in the confirmation samples. One composite confirmation sample consisting of nine subsamples will be collected from unbiased locations at the former location of each pile, and the composite sample will be analyzed for gamma spectroscopy and *Resource Conservation and Recovery Act* (RCRA) metals. Completion of the corrective action for CAS 03-23-30, will be confirmed by evaluating removable contamination levels in the area of the removed soil pile to determine whether levels remain that exceed the removable contamination limits for HCA conditions per the *Nevada National Security Site Radiological Control Manual* (NNSA/NSO, 2012a).

2.1.2.3 Lead Locations

A broken lead-acid battery was removed from CAS 03-26-04 (Figure 2-8) during the CAI. Soil beneath the broken battery exceeds the FAL for lead. Clean closure, as defined in the CADD, consists of the removal of approximately 1.7 cubic yards (yd^3) of soil. A composite confirmation sample plot will be biased to the location where the battery was removed. The sample will consist of nine subsamples that will be collected from unbiased locations within an approximate 2-by-2-meter (m) sample plot.

An area of approximately 220 yd^2 containing scattered lead shot on the soil surface (to a depth of approximately 3 in.) is present within the scope of CAS 03-26-04 (Figure 2-9). Soil beneath the lead shot does not exceed the FAL for lead. Clean closure of this site, as defined in the CADD, consists of the removal of lead shot and affected soil to a depth of approximately 3 in. below ground surface (bgs). Lead-shot removal will be guided by visual inspection to ensure that any remaining contamination will not exceed the FAL for lead in representative confirmation samples. Two

Figure 2-6
CAU 568, CAS 03-23-30 HCA Soil Pile

confirmation samples will be collected, each consisting of nine subsamples from unbiased locations within a 2-by-2-m sample plot. The sample plots will be biased to areas where the greatest amount of lead shot was present.

2.2 Construction QA/QC

QC criteria are detailed in Appendix A.

2.2.1 Sample Collection Activities

Field samples are not required to certify construction activities for closure of CAU 568.

2.2.2 Proposed Laboratory/Analytical Data Quality Indicators

Test cylinders for concrete/grout will be collected and tested in accordance with ASTM International (ASTM) standards. QC criteria are detailed in Appendix A.

Figure 2-7
CAU 568, CAS 03-08-04 Soil and Debris Piles

Figure 2-8
CAU 568, CAS 03-26-04 Lead-Acid Battery Location

Figure 2-9
CAU 568, CAS 03-26-04 Lead Shot

2.3 Waste Management

Waste will be managed and disposed of according to applicable federal, state, and local regulations. Closure activities are expected to generate LLW in the form of soil, debris, and personal protective equipment (PPE); hazardous waste (e.g., lead); and potentially MLLW. Characterization and confirmation of waste disposal will be included in the CAU 568 CR.

2.3.1 Waste Minimization

Closure activities are planned to minimize investigation-derived waste (IDW) generation. Administrative controls, including decontamination procedures and waste characterization strategies, will minimize waste generated during site closure.

2.3.2 Waste Types

The onsite management of wastes will be determined based on regulations associated with the particular waste type (e.g., industrial, low-level) or the combination of waste types. The following subsections describe how specific waste types will be managed.

2.3.3 Industrial Waste

Industrial solid waste, if generated, will be collected, managed, and disposed of in accordance with the solid waste regulations and the permits for operation of the NNSS Solid Waste Disposal Sites. The most commonly generated industrial solid waste includes disposable sampling equipment and PPE that will be collected in plastic bags and marked in accordance with requirements. This waste, and other waste generated such as debris or soil that is characterized as industrial waste, will be packaged in an approved container and dispositioned.

2.3.4 Hazardous Waste

Suspected hazardous waste, if generated, will be containerized and managed in waste accumulation areas in accordance with 40 *Code of Federal Regulations* (CFR) 262.34 (CFR, 2015a).

2.3.5 Low-Level Waste

LLW, if generated, will be managed in accordance with the contractor-specific waste certification program plan, DOE orders, and the requirements of the current version of the *Nevada National Security Site Waste Acceptance Criteria* (NNSA/NFO, 2015b). Potential radioactive waste containers will be staged and managed at a designated radioactive material area (RMA).

2.3.6 Mixed Low-Level Waste

MLLW, if generated, will be managed in accordance with the RCRA requirements (CFR, 2015b), agreements between the DOE, National Nuclear Security Administration Nevada Field Office (NNSA/NFO) and the State of Nevada, and DOE requirements for radioactive waste. Waste characterized as mixed will not be stored for a period of time that exceeds the RCRA requirements unless subject to agreements between NNSA/NFO and the State of Nevada. The MLLW must be transported via an approved hazardous waste/radioactive waste transporter to the NNSS transuranic waste storage pad for storage pending treatment or disposal.

2.4 Confirmation of Corrective Actions

Completion of corrective actions will be confirmed by visual inspection, collection of confirmation samples, and photographic documentation of final site conditions. Confirmation of corrective actions will be included in the CR.

2.4.1 Confirmation Sample Collection

The following subsections describe the activities that will be performed to confirm the completion of corrective actions. A summary of confirmation sample collection is provided in Table 2-1.

2.4.1.1 HCA Soil Pile

Completion of the corrective action will be confirmed by evaluating removable contamination levels in the area of the removed HCA soil pile to determine whether levels remain that exceed the removable contamination limits for HCA conditions per the *Nevada National Security Site Radiological Control Manual* (NNSA/NSO, 2012a). A radiological survey will be conducted, and a confirmation composite sample will be collected in the area of highest radiological survey levels

Table 2-1
Confirmation Sample Methods and Action Levels

Release	Analysis	Action Level	Analytical Method
HCA Soil Pile (CAS 03-23-30)	Composite sample analyzed for gamma spectroscopy and RCRA metals, and any other analyses, depending on biasing factors	Contamination >FALs	HASL 300 GA-01-R [a], EPA SW-846 6010 [b]
Soil and Debris Piles (CAS 03-08-04)	Composite sample analyzed for gamma spectroscopy and RCRA metals, and any other analyses, depending on biasing factors	Contamination >FALs	HASL 300 GA-01-R [a], EPA SW-846 6010 [b]
Lead Releases (CAS 03-26-04)	Composite samples analyzed for RCRA metals at each lead release location	Contamination >FALs	EPA SW-846 6010 [b]
Well Head Covers (CASs 03-23-20, 03-23-31, and 03-23-33)	N/A	N/A	N/A

[a] DOE, 1997
[b] EPA, 2016

EPA = U.S. Environmental Protection Agency
HASL = Health and Safety Laboratory
N/A = Not applicable

detected during the survey. The sample will be analyzed for gamma spectroscopy and RCRA metals, and any other biasing factors identified within the pile.

2.4.1.2 Well Head Covers

Removal of the steel well head covers at CASs 03-23-20, 03-23-31, and 03-23-33 will be confirmed by visual inspection. A radiological survey of the area immediately underneath each well head cover will be performed. Results will be reported in the CAU 568 CR.

2.4.1.3 Soil and Debris Piles

Removal of contaminated soil and debris at CAS 03-08-04 will be confirmed through visual inspection, and by conducting a radiological survey and collecting confirmation composite samples in the areas of highest radiological survey levels detected during the survey (Section 2.1.2.2). Samples will be analyzed for gamma spectroscopy and RCRA metals, and any other biasing factors identified within the piles. A minimum of one composite plot sample will be established in the location of highest radiological readings at each soil and debris pile.

2.4.1.4 Lead Releases

Removal of the soil at the former lead-acid battery location at CAS 03-26-04 will be confirmed by visual inspection and by collecting a composite sample from location of removed soil. The sample will be analyzed for RCRA metals.

Removal of the lead shot at CAS 03-26-04 will be confirmed by collecting one composite confirmation sample from the each of the two areas of greatest bias (areas with greatest accumulation of lead shot). These samples will be analyzed for RCRA metals (see Section 2.1.2.3 for additional details).

2.4.2 Sample Collection Methods

Confirmation samples will be collected by hand using disposable sampling equipment and transported to an offsite laboratory following strict chain-of-custody procedures.

2.4.3 Laboratory/Analytical Data Quality Indicators

All data will be reviewed to ensure the data are usable and complete according to the Soils Activity QAP (NNSA/NSO, 2012a).

Data quality indicators (DQIs) are qualitative and quantitative statements that specify the data requirements of a project and include precision, accuracy, representativeness, comparability, completeness, and sensitivity. The QC criteria for these DQIs are defined in the Soils Activity QAP. Data quality and usability will be evaluated in the CR.

2.5 Permits

Before closure activities begin, planning documents and permits will be prepared. These documents will include a National Environmental Policy Act Checklist; a Real Estate/Operations Permit (REOP); radiological work permits (RWPs); and utility clearances, excavation permits, and blind penetration permits.

2.5.1 National Environmental Policy Act Checklist

A National Environmental Policy Act Checklist will be completed before implementation of closure activities at the site. Closure activities will follow all applicable federal, state, and local laws, regulations, and permits regarding protection of the environment.

2.5.2 Real Estate/Operations Permit

A REOP will be obtained before closure activities begin. The permit will establish NNSA/NFO as the primary authority controlling the site.

2.5.3 Radiological Work Permit

An RWP will be required for work when radiological conditions warrant, as determined by a health physicist. The RWP will inform workers of the specific PPE required and identify site-specific controls. Workers will be required to sign the RWP and acknowledge their understanding of the requirements before entry into any radiologically controlled area. The RWP will be maintained by the radiological control technician at the entrance to the radiologically controlled area.

2.5.4 Utility Clearances, Excavation Permits, and Blind Penetration Permits

An excavation permit and a blind penetration permit will be obtained before excavation activities begin in accordance with applicable site procedures. These permits require that a utility clearance be performed. A copy of the permit will be filed on site throughout the duration of the project.

3.0 Schedule

All preparation and field activities are scheduled for completion in fiscal year 2016. Sufficient flexibility will be incorporated into the field schedule to allow for project delays (e.g., weather, equipment failure). NNSA/NFO will notify NDEP of any condition or event that may impact the project schedule.

4.0 Post-closure Plan

The following CASs will be closed in place with administrative controls, and URs will be implemented to prohibit any unauthorized intrusive activities:

- CAS 03-23-19, T-3U Contamination Area
- CAS 03-23-20, Otero Contamination Area
- CAS 03-23-23, San Juan Contamination Area
- CAS 03-23-31, U-3d Contamination Area
- CAS 03-23-32, U-3j Test Release
- CAS 03-23-33, U-3r Contamination Area
- CAS 03-23-34, U-3ay Contamination area
- CAS 03-45-01, Test Surface Releases

4.1 Inspections

Post-closure inspections will be completed annually at CAU 568. Visual inspections will be conducted to confirm the integrity and effectiveness of the concrete barriers, and to identify repairs. Inspections will document settling, subsidence, erosion, or other impacts to the concrete barriers' effectiveness. Visual inspections will also confirm that the UR postings are in place and readable, and that the URs have been maintained. Results of the inspections will be included in the combined annual letter report and submitted to NDEP. The annual letter report will include a copy of the inspection checklist.

4.2 Monitoring

Exposed concrete/grout surfaces will be visually inspected during the post-closure site inspection (Section 4.1). The inspector will record observations of damage, distress, or deterioration (e.g., cracks, spalling, settlement of subgrade). Cracks 0.5 in. or greater and/or any defect exceeding 2 in. in depth will be repaired within 90 days of discovery. Where the concrete/grout is covered by the form (e.g., steel casing, wood), the concrete barrier is assumed to be intact.

4.3 Maintenance and Repair

Any problems requiring maintenance or repair will be recorded on the inspection checklist. Repair and maintenance activities will be documented in writing at the time of the repair and summarized in the annual letter report.

5.0 References

CFR, see *Code of Federal Regulations*.

Code of Federal Regulations. 2015a. Title 40 CFR, Parts 260 to 282, "Hazardous Waste Management." Washington, DC: U.S. Government Printing Office.

Code of Federal Regulations. 2015b. Title 40 CFR, Part 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions." Washington, DC: U.S. Government Printing Office.

DOE, see U.S. Department of Energy.

EPA, see U.S. Environmental Protection Agency.

ESRI, see ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, and IGP.

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Navarro GIS, see Navarro Geographic Information Systems.

NNSA/NFO, see U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office.

NNSA/NSO, see U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office.

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RSL, see Remote Sensing Laboratory.

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Appendix A

Engineering Specifications and Drawings

A.1.0 Engineering Specifications and Drawings

Grout/concrete for entombment of the well head assemblies at the nine safety experiment sites will be in accordance with accepted construction standards as follows:

- Materials
  - *Portland cement:* Conforming to ASTM C150/C150M, Type II.
  - *Air-entraining admixture:* Conforming to ASTM C260/C260M.
  - *Aggregate:* Conforming to ASTM C33/C33M.
  - *Water:* Clear and free of injurious amounts of oil, acid, alkali, salts, organic matter, and any other substances that may be deleterious to concrete or steel.
  - *Concrete admixtures and cementitious materials:* Use only accepted concrete admixtures and cementitious materials in the mix to improve the water-cement ratio or water-cementitious ratio or workability of the concrete, providing strengths specified and other desirable characteristics of the concrete can be achieved and maintained.
- Mix Criteria
  - Concrete and grout must conform to ASTM C94/C94M, Option A.
  - *Compressive Strength:* 4,000 psi minimum compressive strength at 28 days.
  - Mix designs will produce concrete/grout suited for proper placement and finishing.
- Preparation
  - Inspect forms, earth-bearing surfaces, and reinforcement before placing concrete.
  - Confirm that substrates are in suitable condition to receive concrete/grout.
- Placement
  - Convey and place concrete/grout in compliance with the applicable requirements of American Concrete Institute (ACI) 301, ACI 302.1R, ACI 304R, and ACI 318.
  - Concrete/grout must not be placed until reinforcing is fastened in place and forms/metal casings are in place and complete.
  - Ensure concrete/grout is placed so as to entomb all well head assembly components (e.g., piping, flanges) with minimum of 6 in. of concrete/grout.

- Finishing

  - Ensure concrete/grout is thoroughly worked into all corners and around all embedded items, and into corners of formwork, leaving no excessive voids.

- *Quality Control:* Perform field testing as specified below:

  - Collect at least one set of three cylinders for each day of placing concrete/grout in accordance with ASTM C31/C31M.

  - Test three cylinders after 28 days to determine the compressive strength of the concrete/grout. Compressive strength will be tested in accordance with ASTM C39/C39M.

  - If the average compressive strength of any set of three cylinders broken after 28 days does not achieve the specified strength, then perform the following:

    - Notify NDEP, and determine a path forward based upon protection of current and future workers.

Figures A.2-1 through A.2-3 illustrate examples for the placement of concrete barriers over the well head assemblies. Final as-built drawings will be provided in the CR.

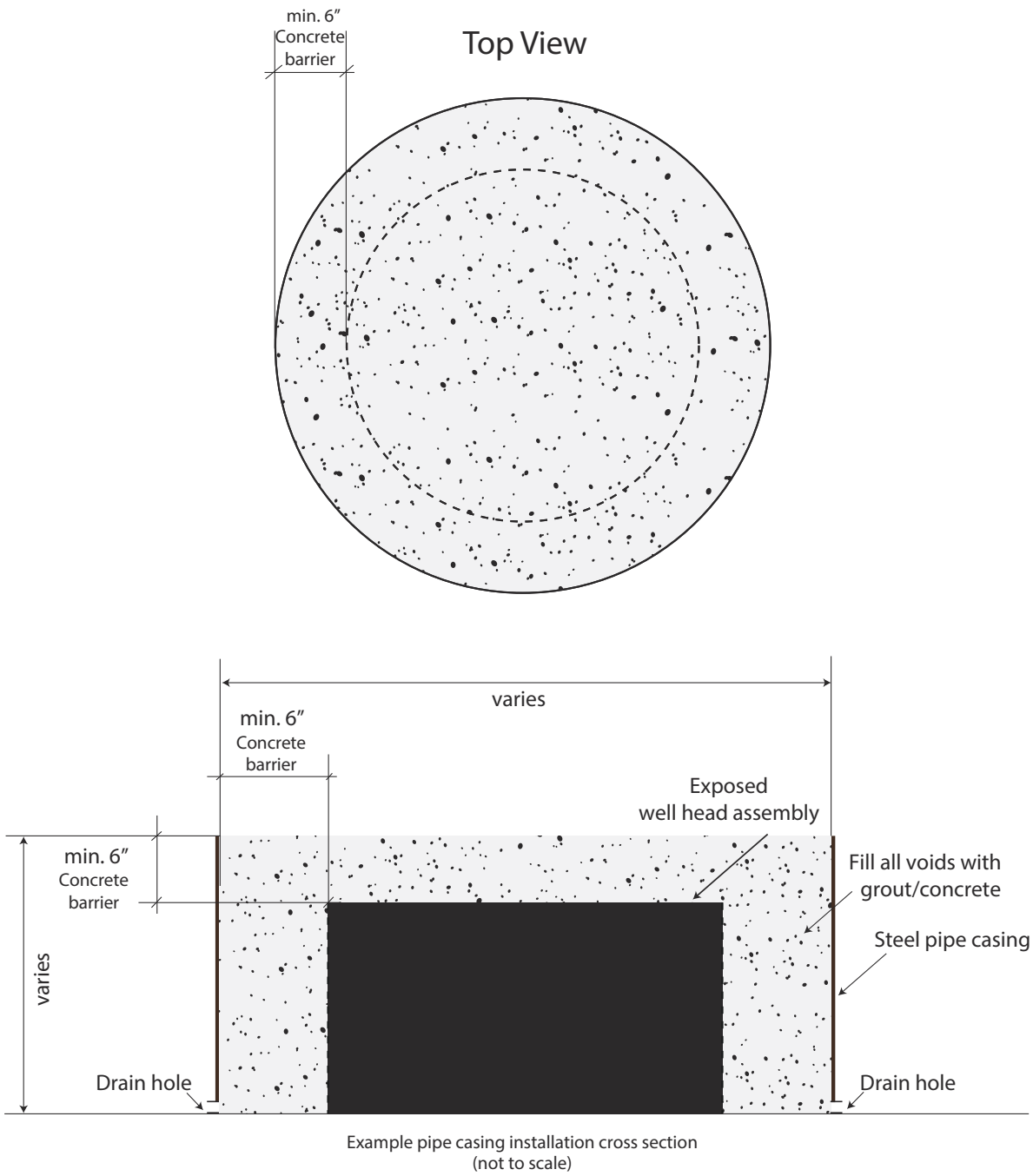

Figure A.2-1
CAU 568, Closure in Place Example for Safety Experiment Well Head Assemblies, Steel Pipe Casing

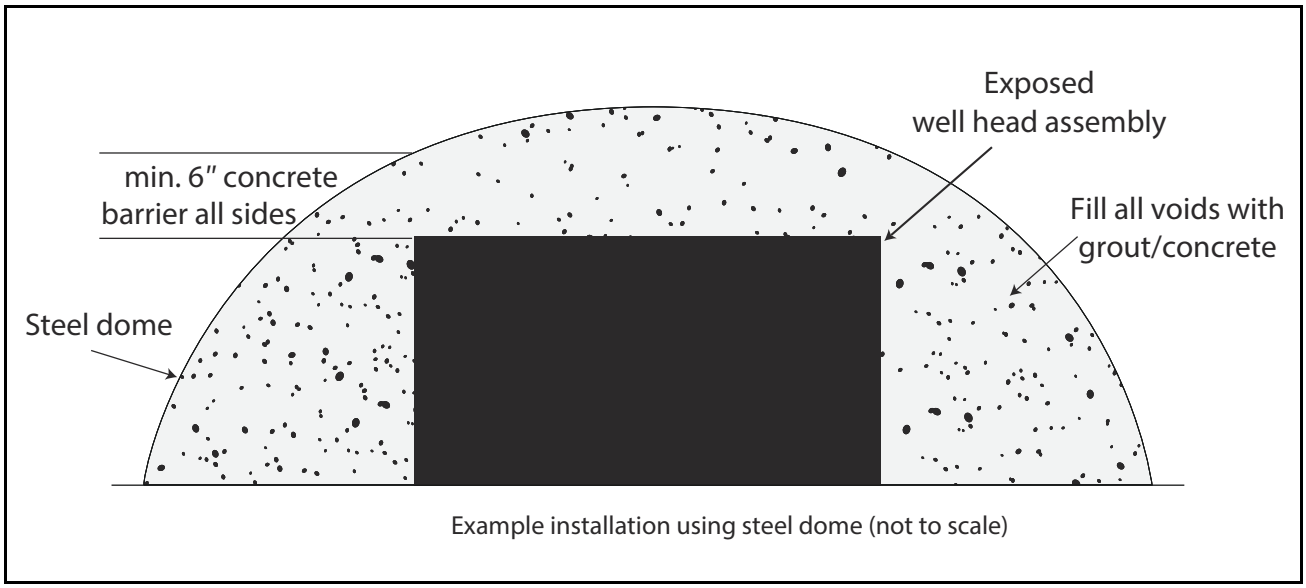

Figure A.2-2
CAU 568, Closure in Place Example for Safety Experiment Well Head Assemblies, Steel Dome

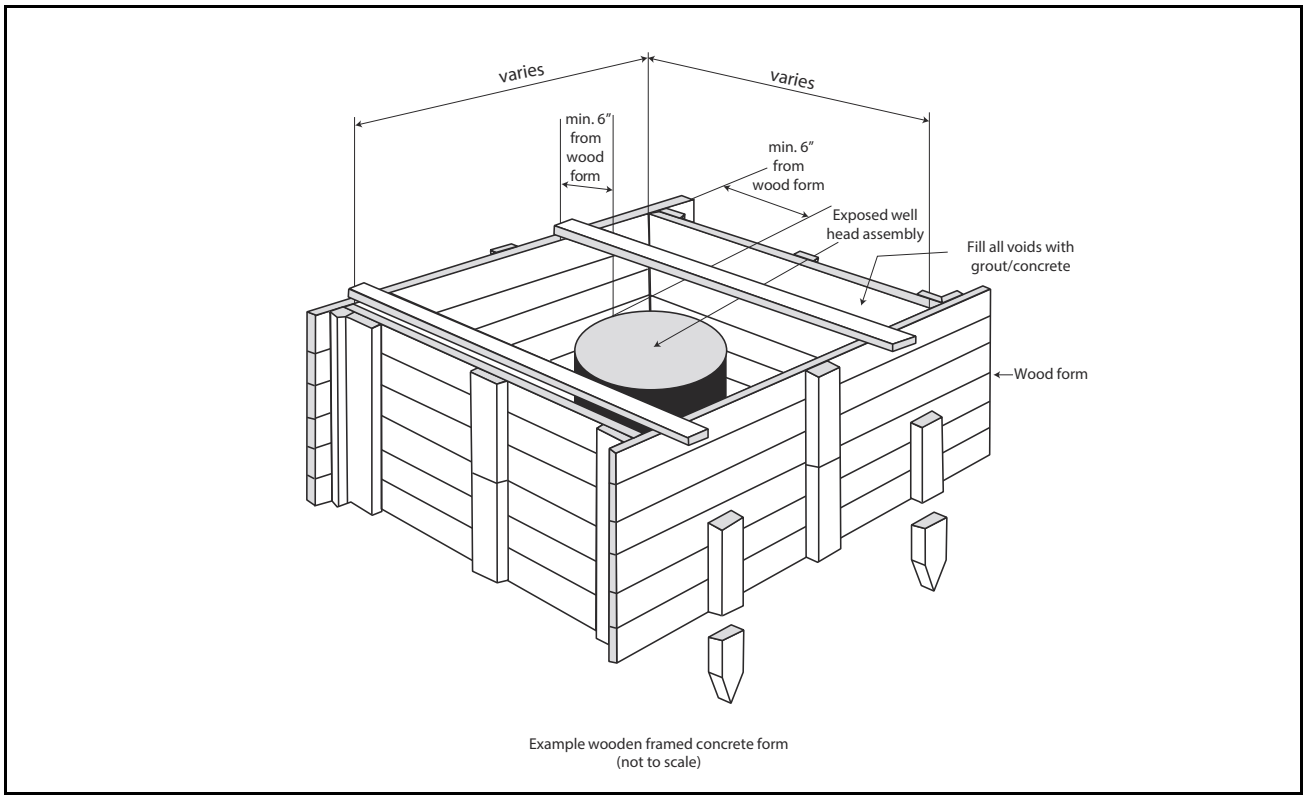

Figure A.2-3
CAU 568, Closure in Place Example for Safety Experiment Well Head Assemblies, Wood Form

A.2.0 References

ACI, see American Concrete Institute.

ASTM, see ASTM International.

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ASTM International. 2015. *Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens*, ASTM C39/C39M-15a. West Conshohocken, PA.

Appendix B

Sampling and Analysis Plan

B.1.0 Sampling and Analysis Plan

The DQOs described in this appendix supplement the DQO process presented in the CAU 568 CAIP (NNSA/NFO, 2014) by adding decisions needed to confirm the completion of required corrective actions listed in the CAU 568 CADD (NNSA/NFO, 2015) and the quality criteria specific to those decisions. These DQOs are designed to ensure that the data collected will provide sufficient and reliable information to technically defend the DQO decisions that confirm that no further corrective actions are necessary after the implementation of clean closure of the three well head covers, HCA soil pile, three soil and debris piles, lead-acid battery soil, and lead shot. The seven steps of the DQO process presented in Sections B.2.0 through B.8.0 were developed in accordance with *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA, 2006).

In general, the procedures used in the DQO process provide a method to establish performance or acceptance criteria, which serve as the basis for designing a plan for collecting data of sufficient quality and quantity to support the goals of a study.

B.2.0 Step 1 - State the Problem

Step 1 of the DQO process defines the problem that requires study and develops a conceptual model of the environmental hazard to be investigated.

B.2.1 Problem Statement

The problem statement for CAU 568 is as follows: "Existing sample information is insufficient to determine whether COCs are present following completion of the clean closure corrective actions."

B.2.2 Conceptual Site Model

The CSM is used to organize and communicate information about site characteristics. It reflects the best interpretation of available information at a point in time. The CSM is a primary vehicle for communicating assumptions about release mechanisms, potential migration pathways, or specific constraints. The CSM describes the most probable scenario for current conditions at each site, and defines the assumptions that are the basis for identifying appropriate sampling strategy and data collection methods. An accurate CSM is important as it serves as the basis for all subsequent inputs and decisions throughout the DQO process.

The CSM was developed for CAU 568 using information from the physical setting, contaminant sources, release information, historical background information, knowledge from similar sites, and physical and chemical properties of the potentially affected media and contaminants of potential concern (COPCs). The CSM presented in the CAU 568 CAIP (NNSA/NFO, 2014) for each of the sites addressed by this appendix was supported by the results of the CAI. No changes were made to the CSM in the CADD (NNSA/NFO, 2015). Therefore, the DQOs presented in this appendix are based on the CSM presented in the CAIP.

B.3.0 Step 2 - Identify the Goal of the Study

Step 2 of the DQO process states how environmental data will be used in meeting objectives and solving the problem, identifies study questions or decision statements, and considers alternative outcomes or actions that can occur upon answering the questions.

B.3.1 Decision Statements

The decision statement is as follows: "Do COCs remain following completion of the clean closure corrective actions?"

For the purposes of these DQOs, a COC is defined as the presence of contamination exceeding the FALs established in the CADD or the presence of removable contamination exceeding the threshold for establishing an HCA.

B.3.2 Alternative Actions to the Decision

After removal actions, if COCs are not present, further corrective action is not required. If COCs are present, additional contamination will be removed.

B.4.0 Step 3 - Identify Information Inputs

Step 3 of the DQO process identifies the information needed, determines sources for information, and identifies methods that will allow reliable comparisons with corrective action criteria.

B.4.1 Information Needs

To resolve the DQO decision (determine whether COCs remain), surveys will be conducted and soil samples will be collected and analyzed following these two criteria:

- Surveys and soil samples must be collected in areas most likely to contain a COC (judgmental sampling).
- The method must be sufficient to identify any COCs present.

B.4.2 Sources of Information

Information to satisfy the DQO decision will be generated by performing visual and radiological surveys, and collecting and analyzing soil samples from the areas of greatest bias (locations of greatest accumulations of PSM) or the areas of highest radiological readings in the general area of the releases.

B.5.0 Step 4 - Define the Boundaries of the Study

Step 4 of the DQO process defines the target population of interest and its relevant spatial boundaries, specifies temporal and other practical constraints associated with survey/data collection, and defines the sampling units on which decisions or estimates will be made.

B.5.1 Target Populations of Interest

The population of interest to resolve the DQO decision (determine whether COCs from the HCA soil pile, three soil and debris piles, well head covers, lead shot, or lead-acid battery are present) is the soil with the highest levels of remaining contamination.

B.5.2 Spatial Boundaries

Spatial boundaries are the maximum lateral and vertical extent of expected contamination that can be supported by the CSM. The DQO decision spatial boundaries are presented in Section A.5.2 of the CAIP (NNSA/NFO, 2014). Contamination found beyond these boundaries may indicate a flaw in the CSM and may require reevaluation of the CSM before the investigation can continue.

B.5.3 Practical Constraints

Practical constraints may be activities by other organizations at the NNSS, utilities, threatened or endangered animals and plants, unstable or steep terrain, and/or access restrictions that may affect the ability to investigate this site. No practical constraints have been identified specific to CAU 568 clean closure confirmation activities.

B.5.4 Define the Sampling Units

The scale of decision making refers to the smallest, most appropriate area or volume for which decisions will be made. The scale of decision making for the CAU 568 confirmation decisions is each of the sites defined as requiring a corrective action of clean closure in the CADD (NNSA/NFO, 2015).

B.6.0 Step 5 - Develop the Analytic Approach

Step 5 of the DQO process specifies appropriate population parameters for making decisions, defines action levels, and generates a decision rule.

B.6.1 Population Parameters

Population parameters are the parameters compared to action levels. The population parameters are COCs identified for each of the clean closure sites in the CADD (NNSA/NFO, 2015).

B.6.2 Action Levels

The FALs for chemicals and radionuclides are established in Appendix D of the CADD (NNSA/NFO, 2015).

B.6.3 Decision Rules

The decision rules applicable to the DQO decision are as follows:

- If contamination levels are inconsistent with the CSM or extend beyond the spatial boundaries identified in Section B.5.2, then work will be suspended and the corrective action strategy will be reconsidered, else the decision will be to continue the corrective action.
- If the population parameter of any COC in the population of interest (defined in Step 4) exceeds the corresponding action level, then additional corrective action will be implemented, else no further corrective action is needed.

B.7.0 Step 6 - Specify Performance or Acceptance Criteria

Step 6 of the DQO process defines the decision hypotheses, specifies controls against false rejection and false acceptance decision errors, examines consequences of making incorrect decisions from the test, and places acceptable limits on the likelihood of making decision errors. This process is unchanged from the CAIP. Refer to Section A.7.0 of the CAIP (NNSA/NFO, 2014) for additional detail on performance or acceptance criteria.

B.8.0 Step 7 - Develop the Plan for Obtaining Data

Step 7 of the DQO process selects and documents a design that will produce data that will best achieve performance or acceptance criteria. A judgmental scheme will be implemented to select survey and sample locations at the HCA soil pile, three soil and debris piles, lead-acid battery soil, and lead shot. A probabilistic sampling scheme will be implemented to select composite sample locations within the sample plots at the HCA soil pile, three soil and debris piles, lead-acid battery soil, and lead-shot area.

As discussed in Section 2.4, a visual inspection will be conducted to confirm whether the PSM/debris/contaminated soil has been removed from the following release areas: HCA soil pile, three soil and debris piles, lead-acid battery location, and lead-shot area. A visual inspection will also be conducted at the locations of the three well head covers to confirm whether the PSM has been removed.

Once the PSM/debris/contaminated soil has been removed from the areas of the three removed soil and debris piles and HCA soil pile, radiological surveys will be conducted to determine whether any elevated radiological readings remain. A soil sample plot will be established at each removed pile location, biased to the area containing the highest radiological readings. One composite confirmation sample consisting of nine subsamples will be collected from unbiased locations within each sample plot. These samples will be analyzed for gamma spectroscopy and RCRA metals (Table 2-1).

For the lead-acid battery location, one composite confirmation sample consisting of nine subsamples will be collected from unbiased locations within an approximate 2-by-2-m sample plot. For the lead-shot area, one composite confirmation sample consisting of nine subsamples will be collected from unbiased locations within an approximate 2-by-2-m sample plot from each of the two areas of greatest bias (areas with greatest accumulation of lead shot). These samples will be analyzed for RCRA metals.

Within the HCA soil pile area, completion of the corrective action will be confirmed by evaluating removable contamination levels in the area of the removed HCA soil pile to determine whether levels

remain that exceed the removable contamination limits for HCA conditions per the *Nevada National Security Site Radiological Control Manual* (NNSA/NSO, 2012).

B.9.0 References

EPA, see U.S. Environmental Protection Agency.

NNSA/NFO, see U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office.

NNSA/NSO, see U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office.

U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office. 2014. *Corrective Action Investigation Plan for Corrective Action Unit 568: Area 3 Plutonium Dispersion Sites, Nevada National Security Site, Nevada*, Rev. 0, DOE/NV--1516. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office. 2015. *Corrective Action Decision Document for Corrective Action Unit 568: Area 3 Plutonium Dispersion Sites, Nevada National Security Site, Nevada*, Rev. 0, DOE/NV--1537. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2012. *Nevada National Security Site Radiological Control Manual*, DOE/NV/25946--801, Rev. 2. Prepared by Radiological Control Managers' Council. Las Vegas, NV.

U.S. Environmental Protection Agency. 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA QA/G-4, EPA/240/B-06/001. Washington, DC: Office of Environmental Information.

Appendix C

Activity Organization

C.1.0 Activity Organization

The NNSA/NFO Soils Activity Lead is Tiffany Lantow. She can be contacted at 702-295-7645.

The identification of the activity Health and Safety Officer and the Quality Assurance Officer can be found in the appropriate plan. However, personnel are subject to change, and it is suggested that the NNSA/NFO Soils Activity Lead be contacted for further information. The Task Manager will be identified in the FFACO Monthly Activity Report prior to the start of field activities.

Appendix D

Nevada Division of Environmental Protection Comments

(15 Pages)

NEVADA ENVIRONMENTAL MANAGEMENT OPERATIONS ACTIVITY
DOCUMENT REVIEW SHEET

1. Document Title/Number: CAP for CAU 568: AREA 3 PLUTONIUM DISPERSION SITES	2. Document Date: February 2016
3. Revision Number: 0	4. Originator/Organization: Nevada Division of Environmental Protection
5. Responsible DOE NNSA/NFO Activity Lead: T. Lantow	6. Date Comments Due:
7. Review Criteria:	
8. Reviewer/Organization Phone No.: NDEP	9. Reviewer's Signature:

10. Comment Number/Location		11. Type[a]	12. Comment	13. Comment Response	14. Accept/Reject
1.	1.1, pg. 2, Fig 1-1		a) This figure must include the CAS names as shown on p. 1, e.g. by adding them next to names currently shown as is done in Figure 1-2. b) Add to the legend the method chosen to clarify addition of CAS names, i.e. "Test Name (CAS Name) or similar.	a) Because there is limited space on the figure, and in order to be consistent, the CAS numbers will be shown on the figure. b) The legend will be revised as appropriate.	
2.	1.1, pg. 3, Fig 1-2		a) Legend shows a Test GZ but none are shown in the figure. b) "Windrows Area" is shown but the CADD indicated no COCs were identified and no corrective action required. It is also shown in the bullet list on p. 1.	a, b) Remove Figure 1-2 from the document, as it is not necessary. Figure 1-1 was revised to identify the 11 CASs and their associated release sites discussed in the CAP.	
3.	1.1, pg. 4, paragraph 1		1st sentence: The sentence is confusing, please reword it.	This sentence was deleted, as it is not necessary to define the purpose of this CAP. The Executive Summary and Section 1.0 were revised to clarify the scope and purpose of the CAP. See response to #4.	
4.	1.1, pg. 4, para. 2		a) Reference the 2015 addition of 8 CASs to this CAU which are releases but were not previously classified as CASs. b) Provide background on how these releases were identified and why they are now considered individual CASs.	a, b) The releases requiring additional corrective action and their associated CASs and corrective actions have been clarified in the Executive Summary and Section 1.0, as described in Attachment A at the end of this DRS.	
5.	1.2, pg. 4, para 1		Consider replacing the word "entombment" with "concrete barriers". Entombment is a recognized NRC decommissioning scenario in which radioactive material is entombed in place to allow the material to decay to a non-hazardous state. The process typically requires an EIS, highly detailed engineering design (resistant to air plane impaction and fire), inspection plan, and environmental monitoring plan to ensure integrity and no environmental migration.	The CAP is not an NRC document, and "entombment" in the context of this document was meant to describe the resulting end state following placement of the concrete/grout barrier. Revise the sentence to: "Corrective actions include placement of a concrete barrier over surface components of the nine safety experiment ground zeroes (GZs) ..."	

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6.	Pgs. 5,6,7; Table 1-1		Replace "Radiological dose" with "Radionuclides" since dose is not a contaminant but rather an effect due to contaminants.	COCs are defined in the Soils RBCA document as any contaminant that is present at a level exceeding a FAL. The FAL was established in the CADD as a dose of 25 mrem/yr. As explained in the Soils RBCA document, a radiological COC is any combination of contaminants that causes the dose FAL to be exceeded. There are no FALs for individual radionuclides. To clarify, a footnote will be added to the bottom of Table 1-1 (now Table 1-2) stating: "A radiological dose COC is the combined dose from radionuclides that exceeds the FAL of 25 mrem/yr."	
7.	1.4, pg. 8, para 1		Consistent with FFACO CAP Outline (Rev. 2, 6/13/12 if not superseded), delete Sec. 14, move content to Section 1.3.	Remove Section 1.4 heading and revise the 1st sentence of former Section 1.4 as follows: "All corrective actions were performed in accordance with the following programmatic plans and documents:"	
8.	2.1, pg. 9, para 1		Add detail about this sentence (dates, circumstances, etc.).	Revise Section 2.1 as follows: "The CAAs were developed on June 11, 2015, by representatives of NDEP and NNSA/NFO. The CAAs are identified in the CADD (NNSA/NFO, 2015a) and were approved by NDEP."	

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9.	2.1.1, pg. 9, para 1		a) 2nd sentence: p. ES-2 states there were no sample locations where the radiological final action level was exceeded, yet Section 2.1.1 states that, due to HCA conditions, it is assumed that the final action level is exceeded. To help validate this assumption, demonstrate (i.e., modeling, calculation, other) why the HCA boundary is appropriate as the UR boundary. b) 4th sentence: confusing; what is a "corrective action boundary"? Will be the HCA boundary be the UR boundary? Where do the warning signs get posted? Rewrite.	a) Following the statement that "there were no sample locations where the radiological FAL was exceeded, the paragraph goes on to explain and provide detail in regard to other areas "where it is assumed that dose could potentially exceed the FAL," including "areas meeting HCA conditions." As discussed in the CADD and several previous Soils documents, *for radiological releases, a COC is defined as the presence of radionuclides that jointly present a dose to a receptor exceeding a FAL of 25 mrem/yr. A corrective action is also required for areas meeting HCA conditions because radiological dose is assumed to exceed the FAL.* No change to document. b) For clarity, revise as follows: "The UR boundary will be established around the corrective action boundary, and UR warning signs will be posted".	
10.	Pg. 10, Fig 2-1		a) There are 13 CASs proposed for closure in place in Tab. 1-1 but only 3 are shown; revise/add figure showing all. b) CAS numbers must be added to revised/added figure showing closure in place CASs.	a) There are 12 release sites within 8 CASs proposed for closure in place. Revise Figure 2-1 to include all the closure in place boundaries for the 8 CASs. Add reference in Subsection 2.1.1.2 to refer to Figure 2-1 for location of closure in place boundaries. b) CASs will be identified by CAS number to remain consistent throughout the document.	
11.	2.1.1.2, pg. 11, para 1		a) Clarify the differences among "steel casings and boreholes", "well head covers or well head assemblies" and "emplacement holes." b) 2nd sentence: Name the removable "contaminants".	a, b) Revise 1st sentence of paragraph 1 as follows: Radiological contamination from these safety experiments was identified as requiring corrective …"	

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12.	2.1.1.2, pg. 11, para 2		This sentence is unclear, e.g.: a) "subsurface contamination" - is the contamination confined to the emplacement hole interior or is it also in the "subsurface" soil and/or on the outside of the emplacement hole? Clarify. b) "exposed well head assembly cover" - previous sentences say the well head assembly will be covered in concrete. Clarify.	a, b) For clarity revise the 2nd paragraph as follows: "URs will be implemented to provide protection from exposure to remaining contamination within the safety experiment DCBs" (i.e., within the boreholes and beneath the surface by preventing excavation activities)".	

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10. Comment Number/Location		11. Type[a]	12. Comment	13. Comment Response	14. Accept/Reject
13.	2.1.1.2, pg. 11, para 3		a) 1st sentence: Figs 2-2 through 2-4 are 'engineering drawings' and should appear in App. A "Engineering Specifications and Drawings". b) 1st sentence: "...meet the criteria ..." what are the "criteria" for a "barrier"? c) Summarize the advantage/disadvantage of these various containment designs, and describe how each would meet the secure closure-in-place alternative for the various types of remnant surface features. d) Clarify the party responsible for engineering design and construction for the barrier(s).	a, b, c) Relocate Figures 2-2 through 2-4 to Appendix A. Revise the reference to the figures in the 1st paragraph of Section 2.1.1.2 and at the end of Appendix A as follows: "Figures A.2-1 through A.2-3 illustrate examples for the placement of concrete barriers over the well head assemblies." However, note that, Figures A.2-1 through A.2-3 are sketches that illustrate examples for placement of a concrete barrier over the well head assemblies. The selected construction methodology will be determined in the field based upon site conditions. Each of the examples shown in Figures A.2-1 through A.2-3 meets the specifications provided in Appendix A (e.g., minimum 6-in. concrete/grout barrier). At CAS 03-23-23 (San Juan), a concrete barrier will also be placed over the steel well head cover adjacent to the emplacement hole (former Figure 2-5, now Figure 2-2). As-built construction details for each concrete barrier placed will be documented in the CR for CAU 568. d) The CAP is an NNSA/NFO document and, as such, NNSA/NFO is responsible for the design and construction of the concrete barriers. Revise the last sentence of Subsection 2.1.1.2 as follows: "As-built construction details prepared by NNSA/NFO or an NNSA/NFO-approved contractor showing the chosen closure in place design for each of the nine safety experiment well head assemblies will be documented in the CR for CAU 568."	

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14.	2.1.1.3, pg. 11, para 1		a) Clarify if the implemented UR is currently/will be posted as an HCA. b) State the reason for the UR in lieu of the CADD reference. Also, ensure consistency with 2.1.1.1.	a, b) Radiological postings are outside the scope of the FFACO and this document; however, for clarity and consistency with Section 2.1.1.1, revise 2.1.1.3 as follows: "The surface release from the Pascal-B shaft safety experiment is included within the scope of CAS 03-23-31. An area of soil contamination near GZ consisting of approximately 717 yd^2 exhibits HCA conditions and is assumed to exceed the FAL. As discussed in the CADD (NNSA/NFO, 2015a), an FFACO UR will be implemented for this area, and UR signs will be posted. The FFACO UR will be provided in the CR. The UR boundary is shown in Figure 2-1".	
15.	Pgs. 12, 13; Figs. 2-1, 2-2, 2-3		Because of unclear use of terminology, it is not clear which designs would apply to which shaft safety experiments and associated surface remnants.	See response to #13.	
16.	Pg. 14, Fig 2-5		Label the well head cover and the emplacement hole.	Revise Figure 2-5 (now Figure 2-2) to label well head cover and emplacement hole.	
17.	2.1.1.4, pg. 14, par 1		State the reason for the corrective action in lieu of the CADD reference.	Rephrase the 2nd sentence as follows: "As explained in the CADD (NNSA/NFO, 2015a), the contamination within the Boomer crater area requires corrective action, as the crater is unsafe to enter and is assumed to exceed the FAL".	
18.	2.1.2.1, pg. 15, par 1, 2		a) Add figure(s) showing each of these well head covers (e.g. those found in CAU 568 DQO presentation, p. 6, Dec 7, 2015). b) Add figure reference to second para.	a) Include new figures showing well head covers at Otero, Luna, Valencia, and San Juan. b) Add reference to figures in Section 2.1.2.1.	

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19.	2.1.2.2, pg. 15, par 1,2		a) This section is not well organized and written; it should be re- presented, for example, in agreement with (IAW) the CAU 568 DQO presentation, i.e.,: retitle: 'Soil and Debris Piles and HCA Soil Pile.' b) Para. 1, last sentence: Insert "lead as a" between "for" and "PSM." c) Para. 2, 1st sentence: Replace "consists of" with "will require." d) Para. 2, 2nd sentence: Due to potential of lead as PSM, why is MLLW not anticipated as a waste type? e) Para 2: 3rd sentence: State the DQOs for the visual survey. f) Para. 2, 4th sentence: Add further details about the radiological surveys to be completed. g) Para 2: State the DQOs for the radiological survey (both hand-held and Stomp and Tromp).	a) The title of this section is sufficient. No change to document. b) Revise 1st paragraph as follows: "CAS 03-23-30 consists of a soil pile containing metallic debris (Figure 2-6) on the ground surface. The soil pile exhibits HCA conditions and is assumed to exceed the FAL (NNSA/NFO, 2015a). CAS 03-08-04 consists of three surface piles containing soil and construction debris (Figure 2-7). Lead items removed from the surface of these piles under an interim corrective action indicate the potential for lead as a PSM to also be present within the piles." c) Revise 1st sentence of 2nd paragraph as follows: "Clean closure, as defined in the CADD, consists of removal of the soil piles, segregation and disposal of any identified PSM, and disposal of the soil and debris." d) The anticipated waste type is LLW. If lead or other PSM is found, it will be managed accordingly. Add the following sentence after low-level waste (LLW), "If lead or other PSM is identified (e.g., mixed low-level waste [MLLW], hazardous waste), it will be managed and dispositioned in accordance with the applicable requirements." e) The visual survey is simply to inspect the site to ensure that the pile and any associated debris have been removed before initiating the radiological survey and confirmation sampling. For clarity, revise "visual survey" to "visual inspection" globally throughout the document. f) Visual inspection and radiological surveys will be conducted to guide the removal of the soil/debris piles. Revise the 4th sentence as follows: "After the initial removal of the piles, a field instrument for the detection of low-energy radiation (FIDLER) survey will be conducted of the soil underneath the location where the soil piles/debris were removed. The FIDLER survey will be used to determine whether additional removal is needed to ensure that remaining contamination will be less than FALs in the confirmation samples." g) Replace the last sentence of Section 2.1.2.2 with the following: "Completion of the corrective action for CAS 03-23-30 will be confirmed by evaluating removable contamination levels in the area of the removed soil pile to determine whether levels remain that exceed the removable contamination limits for HCA conditions per the *Nevada National Security Site Radiological Control Manual* (NNSA/NSO, 2012a)".	

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20.	2.1.2.3, pg. 16, para 1, 2		a) Re-title this section IAW CAU 568 DQO presentation, e.g. "Lead Shot, Lead-Contaminated Soil, and Lead Acid Battery." b) Confirm the tense used in this section is appropriate: "consists" or "will consist"; "exceeds" or "exceeded", etc. c) Para. 1, 4th sentence: DQO states plot composite sample will be collected from excavated soil location, not from "unbiased locations ..." Clarify. d) Para 2, 1st sentence: Replace "large area" with an size estimate of the area containing lead shot including possible extension into Tuna Crater. e) Describe in more detail the "visual inspection" and verification process with regard to lead shot including inside Tuna Crater. f) Sentence beginning with, "Removal of lead shot ..." Sentence is run-on and appears to be grammatically incorrect. Rewrite. g) Confirm this sampling strategy is IAW with the DQO because as currently written it is not clear. h) Para 2: State the DQO's for the visual survey.	a) The title of this section is sufficient. No change to document. b) Revise 2nd sentence of 1st paragraph as follows: "Clean closure, as defined in the CADD, consists of the removal of approximately 1.7 cubic yards (yd^3) of soil." c) The sentence was revised as follows: "A composite confirmation sample plot will be biased to the location where the battery was removed. The sample will consist of nine subsamples that will be collected from unbiased locations within an approximate 2-by-2-meter (m) sample plot." d) Revise 1st sentence as follows: An area of approximately 220 yd^2 containing…". e) Revise the 2nd paragraph of Section 2.1.2.3, starting with the 2nd sentence, as follows: "Clean closure of this site, as defined in the CADD, consists of the removal of lead shot and affected soil to a depth of approximately 3 in. below ground surface (bgs). Lead-shot removal will be guided by visual inspection to ensure that any remaining contamination will not exceed the FAL for lead in representative confirmation samples. Two confirmation samples will be collected, each consisting of nine subsamples from unbiased locations within a 2-by-2-m sample plot. The sample plots will be biased to areas where the greatest amount of lead shot was present." For consistency, revise the last paragraph of Section 2.4.1.4 as follows: "Removal of the lead shot at CAS 03-26-04 will be confirmed by collecting one composite confirmation sample from the each of the two areas of greatest bias (areas with greatest accumulation of lead shot). These samples will be analyzed for RCRA metals (see Section 2.1.2.3 for additional details)." f) Sentence revised above. g) The sampling strategy is consistent with the DQOs. h) Refer to response for #19e.	
21.	Pg. 18, Figs 2-8 and 2-9		Add the CAS (03-26-04) number to these figures.	CAS number 03-26-04 added to titles for Figures 2-8 and 2-9.	
22.	2.3, pg. 19, para 1		a) 2nd sentence: end of sentence, "...used during closure ..." is redundant. b) Last sentence: add, "characterization and" after "of'; add "Draft" before "CAU 568".	a) The technical editor will revise as appropriate. b) Revise last sentence as follows: "Characterization and confirmation of waste disposal will be included in the CAU 568 CR". Note: The relevant information will be provided in the CR, not just the draft version.	

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23.	2.4, pg. 20, par 1		a) 1st sentence: Replace "confirmation" with "verification." b) 1st sentence: State the DQO's for the visual inspection including how they are related to the FAL for lead. c) 2nd sentence: State what detail will be included as confirmation of corrective action; add 'Draft' before "CR."	a) The FFACO requires use of the word "confirmation" for this context in the CAP. Revise the first sentence in Section 2.4 as follows: "Completion of corrective actions will be confirmed by…". Note: Global change for the document; change all uses of the word "verification" to "confirmation." b) See response to # 19e. Visual inspection is a tool used to inspect the site to verify removal before initiating additional surveys and/or sampling. Visual inspection is not related to a FAL. Confirmation sample results are compared to a FAL. No change to document. c) Corrective actions are described in Section 2.1 and, in the following subsection (2.4.1), in Table 2-1. Confirmation of corrective actions will be described in the CR, not just the draft CR. No change to document.	
24.	2.4.1, pg. 21, Table 2-1		a) State the methods controlling the Stomp-and-Tromp, FIDLER, and Visual Surveys in the Analytical Method section of the table. b) State Action Level for Visual Surveys.	a) Table 2-1 will be revised as follows: • Change title to "Confirmation Sample Methods and Action Levels" • Remove "Stomp-and-tromp survey for removable Contamination"; "FIDLER survey", and "Visual Survey" from the Analysis column of Table 2-1, as they are not analytical methods. b) See response to #19e.	

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NEVADA ENVIRONMENTAL MANAGEMENT OPERATIONS ACTIVITY
DOCUMENT REVIEW SHEET

1. Document Title/Number: CAP for CAU 568: AREA 3 PLUTONIUM DISPERSION SITES	2. Document Date: February 2016
3. Revision Number: 0	4. Originator/Organization: Nevada Division of Environmental Protection
5. Responsible DOE NNSA/NFO Activity Lead: T. Lantow	6. Date Comments Due:
7. Review Criteria:	
8. Reviewer/Organization Phone No.: NDEP	9. Reviewer's Signature:

10. Comment Number/Location		11. Type[a]	12. Comment	13. Comment Response	14. Accept/Reject
25.	2.4.1.1, pg. 21, para 1		Reference the document that prescribes the process and specifies the requirements for the stomp-and-tromp survey to verify that removable contamination does not exceed the RadCon Manual limits.	References to stomp-and-tromp surveys have been removed/deleted from the document. The following changes have been made to clarify: • Remove "2,000 dpm/100cm^2 alpha removable" from the action level column in Table 2-1. • Revise the 1st sentence of Section 2.4.1.1 as follows: "Completion of the corrective action will be confirmed by evaluating removable contamination levels in the area of the removed HCA soil pile to determine whether levels remain that exceed the removable contamination limits for HCA conditions per the *Nevada National Security Site Radiological Control Manual* (NNSA/NSO, 2012a)." • Revise the last sentence of the last paragraph in Section B.8.0 as follows: "Within the HCA soil pile area, completion of the corrective action will be confirmed by evaluating removable contamination levels in the area of the removed HCA soil pile to determine whether levels remain that exceed the removable contamination limits for HCA conditions per the *Nevada National Security Site Radiological Control Manual* (NNSA/NSO, 2012).	
26.	2.4.1.2, pg. 22, para 1		Reference the document that prescribes the process and specifies the requirements for the visual inspection.	See response to #19e.	
27.	2.4.1.2, pg. 22, para 1		Given the high count rates, should a verification sample be taken on concrete/ground surface immediately beneath removed well head covers at Luna, Valencia, Otero?	Replace the last sentence with the following: "A radiological survey of the area immediately underneath each well head cover will be performed. Results will be reported in the CAU 568 CR".	

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28.	2.4.1.3, pg. 22, para 1		Reference the document that prescribes the process and specifies the requirements for the: Visual survey; Radiological Survey; and Composite Sampling.	At the end of the 1st sentence, insert "(Section 2.1.2.2)."	
29.	2.4.1.4, pg. 22, par 1, 2		a) Para 1: Re-title section IAW CAU 568 DQO presentation, e.g. "Lead Shot, Lead-Contaminated Soil, and Lead Acid Battery" b) Para 2: Reference the document(s) that prescribe(s) the process and specifies the requirements for the visual inspection and composite sampling.	a) The title of this section is sufficient for the purposes of this document. No change to document. b) At the end of the 2nd paragraph, insert "(see Section 2.1.2.3 for additional details)."	
30.	2.4.2, pg. 22, par 1		Reference the standard sampling procedures.	Delete the 1st sentence in Section 2.4.2, and revise as follows: "Confirmation samples will be collected by hand using disposable sampling equipment and transported to an offsite laboratory following strict chain-of-custody procedures".	
31.	4.1, pg. 26, par 1		a) 1st sentence: Reference the document(s) that prescribes the process and specifies the requirements for post-closure inspections. b) 3rd sentence: This sentence sounds more like a generic, engineered landfill cover inspection protocol than one for a concrete barrier. Clarify.	a) The FFACO agreement prescribes the process for establishing post-closure inspection requirements. FFACO URs establish the requirements for post-closure inspections and will be published in the CR. No change to document. b) Replace "covers" with "concrete barriers" in 2nd and 4th sentences. Also replace the term "cover" globally throughout the document with "concrete barrier."	
32.	4.2, pg. 26, par 1		a) 1st sentence: Reference the document(s) that prescribes the process and specifies the requirements for visual inspection of exposed concrete/grout surfaces. b) There is no discussion about how the "Steel Dome" closure in place alternative would be monitored and repaired.	a) The process and requirements are contained in this section. No change to document. b) Add the following to the end of Section 4.2, "Where the concrete/grout is covered by the form (e.g., steel casing, wood), the concrete barrier is assumed to be intact."	

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33.	A.1.0, pg. A-1, All		Reference the document that prescribes the process and specifies the requirements for the training and qualification of contractor personnel to perform engineering specifications, design, drawings, and quality control.	NNSA/NFO is responsible for ensuring that its contractors are qualified and perform the work to DOE standards and procedures. See response to #13d. No change to document.	
34.	A.1.0, pg. A-1, All		Pu-239 has a half-life of 24,000 yrs. State the engineered life-expectancy of the concrete barrier and the prospect for containment over this half-life.	There is no specific design life-expectancy for the concrete barriers planned for CAU 568, hence the requirement for annual inspections and maintenance. The oldest known concrete-like material similar to modern concrete is only 2,000 years old. Some modern designs have life expectancies of approximately 1,000 years. A common rule of thumb is approximately 50 years; however, the use of good quality admixtures, cement, etc. can extend the life expectancy of concrete. Should land use change, resulting in potential exposures exceeding the current scenario, the closure of CAU 568 would have to be reevaluated to account for the new land use or exposure scenario. No change to document.	
35.	B.7.0, pg. B-7, par 1		State or reference the specific performance or acceptance criteria for visual surveys, visual inspections, stomp-and-tromp, FIDLER surveys, and radiological surveys.	Performance and acceptance criteria for DQO decisions are for decisional data and have not changed from the DQOs in the CAIP. The visual inspections, FIDLER surveys, stomp-and-tromp surveys, and radiological surveys are not decisional data but are decision-supporting data. The data quality of decision-supporting data will be addressed in the DQA section of the CR. No change to document.	
36.	B.8.0, pg. B-8, All		Step 7 of the DQO process selects and documents a design that will produce data that will best achieve performance or acceptance criteria. In light of this, describe or reference the document(s) that prescribe the process and specifies the requirements for visual surveys, radiological surveys, and stomp-and-tromp surveys.	The process and requirements for visual surveys, radiological surveys, and stomp-and-tromp surveys are described in corresponding subsections of Section 2.1 as applied to each of the corrective actions. No change to document.	

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Attachment A

Executive Summary

This Corrective Action Plan (CAP) has been prepared for Corrective Action Unit (CAU) 568, Area 3 Plutonium Dispersion Sites, in Area 3 of the Nevada National Security Site, Nevada, in accordance with the *Federal Facility Agreement and Consent Order* (FFACO). The Corrective Action Decision Document (CADD) for CAU 568 identified 20 release sites that require additional corrective action. The 11 corrective action sites (CASs) and their associated release sites are shown in Table ES-1.

Table ES-1
CAU 568 CASs and Associated Release Sites

CAS Number	CAS Name	Release Name	Corrective Action
03-08-04	Soil and Debris Piles	PSM within Soil and Debris Pile	Clean Closure
03-23-19	T-3U Contamination Area	Chavez HCA (DCB)	Closure in Place
03-23-20	Otero Contamination Area	Otero Well Head Cover	Clean Closure
		Subsurface Contamination within Otero SE DCB	Closure in Place
03-23-23	San Juan Contamination Area	San Juan Well Head Cover	Clean Closure
		Subsurface Contamination within San Juan SE DCB	Closure in Place
		Subsurface Contamination within Pascal-C SE DCB	Closure in Place
03-23-30	HCA Soil Pile	Release from Debris	Clean Closure
03-23-31	U-3d Contamination Area	Luna Well Head Cover	Clean Closure
		Pascal-B HCA	Closure in Place
		Subsurface Contamination within Pascal-B SE DCB	Closure in Place
		Subsurface Contamination within Luna SE DCB	Closure In Place
		Subsurface Contamination within Colfax SE DCB	Closure in Place
03-23-32	U-3j Test Release	Subsurface Contamination within Pascal-A SE DCB	Closure in Place
03-23-33	U-3r Contamination Area	Valencia Well Head Cover	Clean Closure
		Subsurface Contamination within Valencia SE DCB	Closure in Place
03-23-34	U-3ay Contamination Area	Subsurface Contamination within Chipmunk SE DCB	Closure in Place
03-26-04	Test-Related Debris	Lead from Broken Lead-Acid Battery	Clean Closure
		Lead from Lead Shot	Clean Closure
03-45-01	Test Surface Releases	Boomer Test Surface Release	Closure in Place

DCB = Default contamination boundary
HCA = High contamination area
PSM = Potential source material
SE = Safety experiment

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The purpose of this CAP is to provide the plan for implementation of the recommended corrective action alternatives (CAAs) for CAU 568. Site characterization activities were performed in 2014, and the results are presented in Appendix A of the CAU 568 CADD. The CAAs were recommended in the CADD. The scope of work required to implement the recommended CAAs of closure in place and clean closure at 11 of the 14 CASs includes the following:

- The installation of physical barriers over the nine safety experiment ground zeroes to cover contamination at CASs 03-23-20 (Otero), 03-23-23 (San Juan and Pascal-C), 03-23-31 (Pascal-B, Luna, Colfax), 03-23-32 (Pascal-A), 03-23-33 (Valencia), and 03-23-34 (Chipmunk).
- The characterization and removal of three soil and debris piles at CAS 03-08-04, and one HCA soil pile at CAS 03-23-30.
- The removal of three steel well head covers (PSM) from CASs 03-23-20 (Otero), 03-23-31 (Luna), and 03-23-33 (Valencia).
- The removal of soil and lead PSM from two locations at CAS 03-26-04.
- Implementation of FFACO use restrictions at the nine safety experiment ground zeroes at CASs 03-23-20, 03-23-23, 03-23-31, 03-23-32, 03-23-33, and 03-23-34; the steel well head cover at CAS 03-23-23; the areas meeting HCA conditions at CASs 03-23-19 and 03-23-31; and the Boomer crater area at CAS 03-45-01. The FFACO use restriction boundaries will be presented in the CAU 568 closure report.

Replace the following from page 1 of the Introduction:

CAU 568 comprises the 14 corrective action sites (CASs) listed below:

- 03-08-04, Soil and Debris Piles
- 03-23-17, S-3I Contamination Area
- 03-23-19, T-3U Contamination Area
- 03-23-20, Otero Contamination Area
- 03-23-22, Platypus Contamination Area
- 03-23-23, San Juan Contamination Area
- 03-23-26, Shrew/Wolverine Contamination Area
- 03-23-30, HCA Soil Pile
- 03-23-31, U-3d Contamination Area
- 03-23-32, U-3j Test Release
- 03-23-33, U-3r Contamination Area
- 03-23-34, U-3ay Contamination Area
- 03-26-04, Test-Related Debris
- 03-45-01, Test Surface Releases

CAU 568 is located in the western portion of Area 3. These 14 CASs include the test releases and debris items associated with 25 underground

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safety experiments and weapons-related tests, and one atmospheric safety experiment conducted in the approximately 0.5-square-mile (mi^2) footprint of CAU 568. Figures 1-1 and 1-2 show the CASs and releases in the scope of CAU 568.

With:

The Corrective Action Decision Document (CADD) for CAU 568 (NNSA/NFO, 2015a) identified 20 release sites that require additional corrective action. The release sites and their associated 11 corrective action sites (CASs) are shown in Table 1-1. Figure 1-1 shows the CASs and releases within the scope of this CAP.

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