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Nevada
Environmental
Restoration
Project

National Nuclear Security Administration

Corrective Action Plan for Corrective Action Unit 543: Liquid Disposal Units, Nevada Test Site, Nevada

Controlled Copy No.:_____

Revision: 1

April 2007

Environmental Restoration
Project

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office

DISCLAIMER

DOE/NV--1168-REV 1

CORRECTIVE ACTION PLAN FOR CORRECTIVE ACTION UNIT 543: LIQUID DISPOSAL UNITS, NEVADA TEST SITE, NEVADA

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

Controlled Copy No.____
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CORRECTIVE ACTION PLAN
FOR CORRECTIVE ACTION UNIT 543:
LIQUID DISPOSAL UNITS,
NEVADA TEST SITE, NEVADA

Approved By: SIGNATURE APPROVED Date: 4/25/2007
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Acting Federal Project Director
Environmental Restoration Project

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ACRONYMS AND ABBREVIATIONS

AST	Aboveground Storage Tank
BMP	best management practice
BN	Bechtel Nevada
CADD	Corrective Action Decision Document
CAIP	Corrective Action Investigation Plan
CAP	Corrective Action Plan
CAS	Corrective Action Site
CAU	Corrective Action Unit
COC	contaminant(s) of concern
CR	Closure Report
DOE	U.S. Department of Energy
DQI	data quality indicator
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
FAL	final action level(s)
FFACO	*Federal Facility Agreement and Consent Order*
ft	foot (feet)
gal	gallon(s)
LLW	low-level waste
MW	mixed waste
NDEP	Nevada Division of Environmental Protection
NEPA	*National Environmental Policy Act*
NNSA/NSO	U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office
NSTec	National Security Technologies, LLC
NTS	Nevada Test Site
NV/YMP	Nevada Yucca Mountain Project
OI	Organization Instruction
OP	Organization Procedure
PCB	polychlorinated biphenyl
PPE	personal protective equipment

ACRONYMS AND ABBREVIATIONS (continued)

ppm	parts per million
PSP	perforated steel plate
QA	quality assurance
QC	quality control
REOP	Real Estate/Operations Permit
RPD	relative percent difference
RWP	Radiological Work Permit
TPH	total petroleum hydrocarbons
TSD	treatment, storage, and disposal
UR	use restriction
VOCs	volatile organic compounds
WGS	Waste Generator Services
%R	percent recovery

EXECUTIVE SUMMARY

Corrective Action Unit (CAU) 543, Liquid Disposal Units, is listed in Appendix III of the *Federal Facility Agreement and Consent Order* of 1996. CAU 543 consists of seven Corrective Action Sites (CASs) located in Areas 6 and 15 of the Nevada Test Site, which is approximately 65 miles northwest of Las Vegas, Nevada. CAU 543 consists of the following seven CASs:

- CAS 06-07-01, Decon Pad
- CAS 15-01-03, Aboveground Storage Tank
- CAS 15-04-01, Septic Tank
- CAS 15-05-01, Leachfield
- CAS 15-08-01, Liquid Manure Tank
- CAS 15-23-01, Underground Radioactive Material Area
- CAS 15-23-03, Contaminated Sump, Piping

From January 24, 2005, through April 14, 2005, CAU 543 site characterization activities were conducted, and are reported in Appendix A of the CAU 543 Corrective Action Decision Document (CADD) (U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office [NNSA/NSO], 2005). The recommended corrective action as stated in the approved CADD is No Further Action for five of the CAU 543 CASs, and Closure In Place for the remaining two CASs.

The site characterization results and the recommended closure activities according to the approved CADD (NNSA/NSO, 2005) for each CAS include the following:

- **CAS 06-07-01, Decon Pad,** is located at the Area 6 Decontamination Facility. Polychlorinated biphenyls (PCBs) were reported as contaminants of concern (COC) during site characterization (NNSA/NSO, 2005). The CAS will be closed in place with administrative controls by posting appropriate use restriction (UR) warning signs around the perimeter of the Building 6-605 foundation and implementing a land UR, with best management practices (BMPs).

- **CAS 15-01-03, Aboveground Storage Tank,** is located at the former U.S. Environmental Protection Agency (EPA) Farm in Area 15, and no COCs are present above action levels. The site will be closed by taking no further action (NNSA/NSO, 2005) with BMPs.

- **CAS 15-04-01, Septic Tank,** is located at the former EPA Farm in Area 15, and no COCs are present above action levels. The site will be closed by taking no further action (NNSA/NSO, 2005) with BMPs.

- **CAS 15-05-01, Leachfield,** is located at the former EPA Farm in Area 15 and consists of a leachfield and distribution box southeast of the Building 15-06 foundation, and no COCs are present at this site above action levels. The site will be closed by taking no further action (NNSA/NSO, 2005) with BMPs.

- **CAS 15-08-01, Liquid Manure Tank,** is located at the former EPA Farm in Area 15, and no COCs are present above action levels. The site will be closed by taking no further action (NNSA/NSO, 2005) with BMPs.

- **CAS 15-23-01, Underground Radioactive Material Area,** is located at the former EPA Farm in Area 15, and no COCs are present above action levels. The site will be closed by taking no further action (NNSA/NSO, 2005) with BMPs.

- **CAS 15-23-03, Contaminated Sump, Piping,** is located at the former EPA Farm in Area 15 and consists of a sump and associated piping between the sump and the CAS 15-01-03 distribution box. PCBs and plutonium-238 concentrations above action levels are present in the soil at the sump floor, and the site will be closed in place with administrative controls by backfilling and compacting the sump with clean fill material, grading the sump area to prevent precipitation run-on, and posting UR signage around the perimeter of the sump.

1.0 INTRODUCTION

Corrective Action Unit (CAU) 543: Liquid Disposal Units is listed in Appendix III of the *Federal Facility Agreement and Consent Order* (FFACO) which was agreed to by the state of Nevada, the U.S. Department of Energy (DOE), and the U.S. Department of Defense (FFACO, 1996). CAU 543 sites are located in Areas 6 and 15 of the Nevada Test Site (NTS), which is approximately 65 miles northwest of Las Vegas, Nevada. CAU 543 consists of the following seven Corrective Action Sites (CASs) (Figure 1):

- CAS 06-07-01, Decon Pad
- CAS 15-01-03, Aboveground Storage Tank
- CAS 15-04-01, Septic Tank
- CAS 15-05-01, Leachfield
- CAS 15-08-01, Liquid Manure Tank
- CAS 15-23-01, Underground Radioactive Material Area
- CAS 15-23-03, Contaminated Sump, Piping

All Area 15 CASs are located at the former U.S. Environmental Protection Agency (EPA) Farm, which operated from 1963 to 1981 and was used to support animal experiments involving the uptake of radionuclides. Each of the Area 15 CASs, except CAS 15-23-01, is associated with the disposal of waste effluent from Building 15-06, which was the primary location of the various tests and experiments conducted onsite. Waste effluent disposal from Building 15-06 involved piping, sumps, outfalls, a septic tank with leachfield, underground storage tanks, and an aboveground storage tank (AST). CAS 15-23-01 was associated with decontamination activities of farm equipment potentially contaminated with radiological constituents, pesticides, and herbicides. While the building structures were removed before the investigation took place, all the original tanks, sumps, piping, and concrete building pads remain in place.

The Area 6 CAS is located at the Decontamination Facility in Area 6, a facility which operated from 1971 to 2001 and was used to decontaminate vehicles, equipment, clothing, and other materials that had become contaminated during nuclear testing activities. The CAS includes the effluent collection and distribution systems for Buildings 6-605, 6-606, and 6-607, which consists of septic tanks, sumps, piping, floor drains, drain trenches, cleanouts, and a concrete foundation.

Additional details of the site history are provided in the CAU 543 Corrective Action Investigation Plan (CAIP) (U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office [NNSA/NSO], 2004a), and the CAU 543 Corrective Action Decision Document (CADD) (NNSA/NSO, 2005).

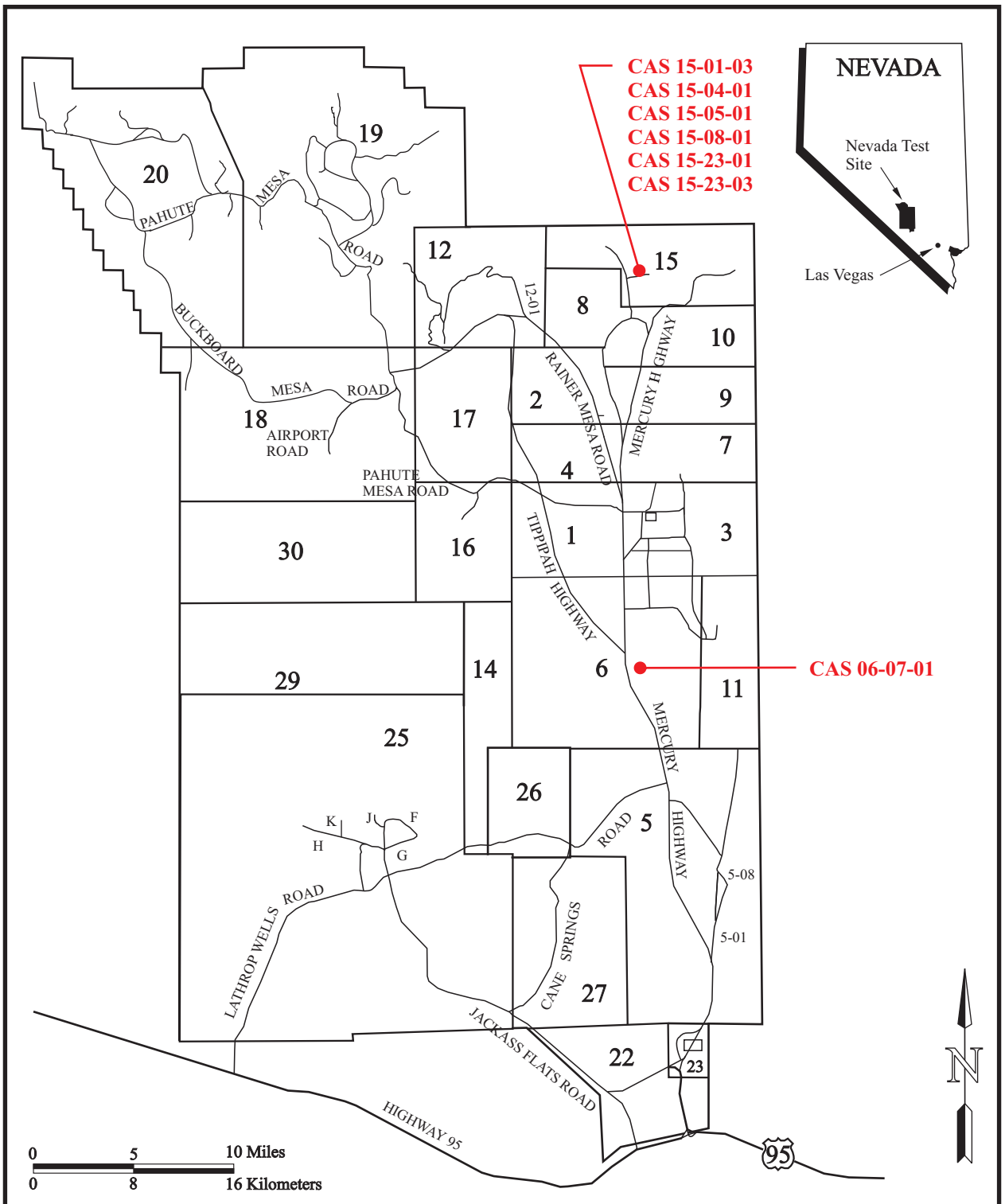


FIGURE 1
CAU 543 SITE LOCATION MAP

1.1 PURPOSE

The purpose of this Corrective Action Plan (CAP) is to provide the detailed scope of work required to implement the recommended corrective actions as specified in the approved CADD (NNSA/NSO, 2005).

CAU 543 consists of seven CASs located in Areas 6 and 15 of the NTS. The sites were characterized in 2005 according to the approved CAIP (NNSA/NSO, 2004a). The results of the site characterization are reported in Appendix A of the CAU 543 CADD (NNSA/NSO, 2005).

CAS 06-07-01, Decon Pad, is located at the Decontamination Facility in Area 6. The CAS consists of the effluent collection and distribution systems for Buildings 6-605, 6-606, and 6-607, which include two 1,000-gallon (gal) septic tanks, two ground-level sumps and associated piping, the concrete foundation of Building 6-605, floor drains, drain trenches, and cleanouts. Polychlorinated biphenyls (PCBs) are the only contaminants of concern (COCs) present above action levels in the soil around the Decontamination Facility foundation.

CAS 15-01-03, Aboveground Storage Tank, is located at the former EPA Farm in Area 15 and consists of a radiologically contaminated 25,000-gal tank located within a pit south of the former location of Building 15-06 as well as the associated piping between the tank and the Building 15-06 foundation, and the exterior holding pens. The tank, which was originally located at the Area 5 Contaminated Waste Dump, contains waste from the metabolism and slaughter rooms within Building 15-06 as well as waste from the holding pens. No COCs are present above action levels (NNSA/NSO, 2005).

CAS 15-04-01, Septic Tank, is located at the former EPA Farm in Area 15 and consists of a 1,000-gal septic tank, piping, and a cleanout southeast of Building 15-06. Four floor drains, four sinks, and one toilet discharged to the septic tank from the Small Animal Laboratory, Biology Laboratory, Utility Room, and restroom within Building 15-06. No COCs are present above action levels (NNSA/NSO, 2005).

CAS 15-05-01, Leachfield, is located at the former EPA Farm in Area 15 and consists of a leachfield and distribution box southeast of the Building 15-06 foundation. No COCs are present at this site above action levels (NNSA/NSO, 2005).

CAS 15-08-01, Liquid Manure Tank, is located at the former EPA Farm in Area 15 and consists of a liquid manure tank, associated piping, and a concrete pad and drain northwest of the Building 15-06 foundation, which were used for the disposal of excess milk from the dairy cows, and wastes from the autopsy laboratory, milking room, and metabolism room. No COCs are present above action levels (NNSA/NSO, 2005).

CAS 15-23-01, Underground Radioactive Material Area, is located at the former EPA Farm in Area 15 and consists of an area of soil surrounding and underlying a perforated steel plate (PSP) (e.g., grate) measuring approximately 19 by 22 feet (ft). No COCs are present above action levels (NNSA/NSO, 2005).

CAS 15-23-03, Contaminated Sump, Piping, is located at the former EPA Farm in Area 15 and consists of a sump and associated piping between the sump and the CAS 15-01-03 distribution box. The sump was used primarily for the collection of liquid waste from the Building 15-06 laboratory. Concentrations of PCBs and plutonium-238 concentrations greater than action levels are in the soil at the sump floor, with the contamination confined laterally by the concrete side walls and vertically by a hard, underlying stratigraphic layer. The site will be closed in place with administrative controls by backfilling and compacting the sump with clean fill material, reestablishing appropriate signage around the perimeter of the sump, and establishing a site monitoring program.

1.2 SCOPE

The CADD identifies Closure in Place with Administrative Controls as the preferred corrective action for CASs 06-07-01 and 15-23-03 and No Further Action for the remaining CASs of CAU 543 (NNSA/NSO, 2005). Briefly, the scope of work to implement this corrective action includes the following.

CAS 06-07-01, Decon Pad, will be closed in place with administrative controls by posting appropriate use restriction (UR) warning signs around the perimeter of the Building 6-605 foundation and implementing a land UR. As a best management practice (BMP), the contents of the septic tanks, Sumps 1 and 2, and diversion boxes as well as the septic tanks, sumps, and associated piping (that comes out when the structures are removed) will be removed, solidified if necessary, and/or excavated and disposed of in an appropriate facility. Sediment contained within floor drains and trenches will be removed, containerized, and disposed of in an appropriate facility. The floor drains and trenches will then be filled with concrete and all open holes, diversion boxes, and cleanouts will be grouted to grade. Any remaining debris, containers, drums, and associated waste within the storage yard will be sampled, if necessary, and disposed of at an appropriate facility. Samples will be collected from the excavations created by removing the septic tanks and sumps to verify that these structures have not released contaminants to the soil at concentrations above the final action levels (FALs) established in the CADD. After receipt of this verification, excavations will be backfilled.

CAS 15-01-03, Aboveground Storage Tank, will be closed by taking no further action. As a BMP, the liquid and solid contents of the AST and distribution box will be removed, solidified if necessary, and disposed of at an appropriate facility. The aboveground piping and distribution box will be removed and disposed of at an appropriate facility. The AST will be removed and disposed of at an appropriate facility. Samples will be collected from the excavation created by removing the distribution box to verify that there has not been a release of contaminants to the soil at concentrations above the FALs established in the CADD. After receipt of this verification, the distribution box excavation will be backfilled. Sediment will be removed from the Building 15-06 floor drain trenches and disposed of at an appropriate facility. Trenches will then be grouted to grade. Appropriate signage will be reestablished around the perimeter of the foundation based on a radiological demarcation survey, as required by the NV/YMP

Radiological Control Manual (U.S. Department of Energy, Nevada Site Office [NNSA/NSO], 2004b) and a UR will be implemented for the PCBs remaining in the Building 15-06 floor drain trenches and buried piping.

CAS 15-04-01, Septic Tank, will be closed by taking no further action. Samples may be collected from the septic tank, if needed for waste profiling. As a BMP, the septic tank contents, the concrete tank structure, and the pipe located on top of the septic tank will be excavated and/or removed and disposed of at an appropriate facility. Samples will be collected from the excavation created by removing the septic tank to verify that there has not been a release of contaminants to the soil at concentrations above the FALs established in the CADD. After receipt of this verification, the excavated area will be backfilled with clean fill.

CAS 15-05-01, Leachfield, will be closed by taking no further action. As a BMP, the contents of the distribution box, the loose pipe located on top of the distribution box, and the distribution box and associated piping between the distribution box and septic tank will be excavated and/or removed and disposed of at an appropriate facility. Samples will be collected from the excavation created by removing the distribution box and piping to verify that these structures have not released contaminants to the soil at concentrations above the FALs established in the CADD. After receipt of this verification, the excavated area will be backfilled with clean fill.

CAS 15-08-01, Liquid Manure Tank, will be closed by taking no further action. As a BMP, the wooden debris in and around the liquid manure tank, the contents of the manure tank, and the tank itself, will be excavated and/or removed and disposed of at an appropriate disposal facility. Samples will be collected as needed to profile the waste contained within the tank. Samples may be collected from the excavation created by removing the manure tank if analytical results indicate that a release of the tank contents could impact the soil with concentrations greater than the FALs established in the CADD. The excavation will be backfilled with clean fill.

CAS 15-23-01, Underground Radioactive Material Area, will be closed by taking no further action. As a BMP, the steel grate and miscellaneous debris will be removed and disposed of at an appropriate facility. A radiological demarcation survey will be conducted to determine whether or not the current posting can be downgraded or removed, and appropriate signage will be reestablished around the perimeter of the CAS based on the demarcation survey results, as required by the NV/YMP Radiological Control Manual (NNSA/NSO, 2004b).

CAS 15-23-03, Contaminated Sump, Piping, will be closed in place with administrative controls by backfilling and compacting the sump with clean fill material, grading the sump area to prevent precipitation run-on, reestablishing the Underground Radioactive Material Area signs around the perimeter of the sump, implementing a UR and installing required signs, and establishing a monitoring program to ensure that signs are in place and legible.

1.3 CORRECTIVE ACTION PLAN CONTENTS

This CAP is comprised of the following sections and appendices:

Section 1.0 Introduction
Section 2.0 Detailed Statement of Work
Section 3.0 Schedule
Section 4.0 Post-Closure Plan
Section 5.0 References
Appendix A.1 Engineering Specifications and Drawings
Appendix A.2 Sampling and Analysis Plan
Appendix A.3 Project Organization
Library Distribution List

Appendix A.1 is included in this CAP as required by the approved FFACO CAP outline, but contains no material because engineering specifications or drawings are not necessary for site closure. Similarly, Appendix A.2 is included as required but contains no material, because Section 2.4 provides sufficient detail on sample collection.

This report was developed using information and guidance from the following documents:

- *Federal Facility Agreement and Consent Order* (FFACO, 1996)
- Corrective Action Investigation Plan for Corrective Action Unit 543 (NNSA/NSO, 2004a)
- Corrective Action Decision Document for Corrective Action Unit 543 (NNSA/NSO, 2005)

2.0 DETAILED STATEMENT OF WORK

2.1 CORRECTIVE ACTIONS

Three corrective action alternatives for CAU 543 were identified in the CADD (NNSA/NSO, 2005):

Alternative 1 – No Further Action
Alternative 2 – Clean Closure
Alternative 3 – Closure in Place with Administrative Controls

2.1.1 Alternative 1 – No Further Action

Of the three alternatives listed above, the approved corrective action is No Further Action (Alternative 1) for the CASs listed below (NNSA/NSO, 2005).

2.1.1.1 CAS 15-01-03, Aboveground Storage Tank

CAS 15-01-03 consists of a radiologically contaminated 25,000-gal tank located within a pit south of the former location of Building 15-06, the associated piping between the tank and the Building 15-06 foundation, and the exterior holding pens. The tank contains waste from the metabolism and slaughter rooms within Building 15-06 as well as waste from the EPA Farm holding pens.

Though no COCs above action levels were reported during site characterization (NNSA/NSO, 2005), because the AST contains liquids and sediments, the liquid and solid contents of the AST and distribution box will be separated if possible, removed, and disposed of at an appropriate facility. The aboveground piping will be removed, and the distribution box will be excavated and removed. Both will be disposed of as low-level waste (LLW). The AST will be removed and disposed of based on its status after contents have been removed.

As a BMP, one soil sample will be collected from beneath the distribution box and analyzed for diesel-range total petroleum hydrocarbons (TPH), PCBs, and radiological constituents to confirm that concentrations are less than FALs established in the CADD. Waste characterization results presented in the CADD indicate that, if waste from the distribution box is released to the soil, TPH, PCBs, and several radiological constituents could exceed these levels. This sample will be collected from the area most likely to be impacted with the contents from the distribution box. After confirmation is received, the distribution box excavation will be filled with clean fill.

Sediment within the Building 15-06 floor drain trenches is PCB remediation waste and will be removed and disposed of at the appropriate facility. The floor drain trenches will then be filled with grout. Appropriate signage will be reestablished around the perimeter of the building foundation based on demarcation survey results, as required by the NV/YMP Radiological Control Manual (NNSA/NSO, 2004b) and a UR for PCBs will be implemented for the

Building 15-06 pad and remaining buried piping. Because characterization samples showed PCB concentrations to be between 25 and 50 parts per million (ppm) on the building foundation, the pad will also be fenced and the appropriate PCB signs will be affixed. Fencing will not be placed around the buried piping because PCBs are buried and the UR prohibits excavation.

2.1.1.2 CAS 15-04-01, Septic Tank

CAS 15-04-01 is located at the former EPA Farm in Area 15 and consists of a 1,000-gal septic tank, piping, and a cleanout southeast of Building 15-06. Four floor drains, four sinks, and one toilet discharged to the septic tank from the Small Animal Laboratory, Biology Laboratory, Utility Room, and restroom within Building 15-06.

No COCs above action levels were detected (NNSA/NSO, 2005). As a BMP, the septic tank contents, the concrete tank structure, and the pipe located on top of the septic tank will be excavated and/or removed, solidified with native fill if necessary, and disposed at an appropriate facility. Waste samples will be collected as needed to determine the appropriate waste disposal pathway. Sample results to date indicate that the tank and its contents are TPH waste. The contents of the septic tank will be solidified with NTS native fill (either in the tank or in a lined basin), and disposed of at the appropriate facility. The septic tank itself will be removed and disposed of according to the wastes contained within both sides of the tank.

As a BMP, one soil sample will be collected from beneath the septic tank and analyzed for diesel-ranged TPH, PCBs, and radiological constituents to confirm that concentrations are less than FALs established in the CADD. Waste characterization results presented in the CADD indicate that, if waste from the septic tank is released to the soil, these constituents could exceed the FALs. This sample will be collected from the area most likely to be impacted with the contents from the septic tank. After confirmation is received, the excavated area will be backfilled with clean fill.

2.1.1.3 CAS 15-05-01, Leachfield

CAS 15-05-01 is located at the former EPA Farm in Area 15 and consists of a leachfield and distribution box southeast of the Building 15-06 foundation. No COCs are present at this site above action levels (NNSA/NSO, 2005). As a BMP, the contents of the distribution box, the loose pipe located on top of the distribution box, the distribution box, and associated piping between the distribution box and the CAS 15-04-01 septic tank will be excavated and/or removed, solidified with native fill if necessary, and disposed of at an appropriate facility.

As a BMP, one soil sample will be collected from beneath the distribution box and analyzed for diesel-ranged TPH to confirm that concentrations are less than FALs established in the CADD. Waste characterization results presented in the CADD indicate that, if waste from the distribution box is released to the soil, diesel-ranged TPH could exceed these levels. This sample will be collected from the area most likely to be impacted with the contents from the distribution box. After confirmation is received, the excavated area will be backfilled with clean fill.

2.1.1.4 CAS 15-08-01, Liquid Manure Tank

CAS 15-08-01 is located at the former EPA Farm in Area 15 and consists of a liquid manure tank, associated piping, and a concrete pad and drain northwest of the Building 15-06 foundation, which were used for the disposal of excess milk from the dairy cows, and wastes from the autopsy laboratory, milking room, and metabolism room. No COCs are present at this site above action levels (NNSA/NSO, 2005). As a BMP, the wooden debris in and around the liquid manure tank will be disposed of as hydrocarbon waste.

Waste characterization samples will be collected as needed to determine the appropriate disposal pathway of the manure tank and its contents. Sample results to date indicate the tank contents could be LLW and/or TPH waste; however, additional sample data are required for this waste determination. The contents of the manure tank and the tank itself will be excavated and/or removed and disposed of at an appropriate disposal facility. Soil samples will only be collected from beneath the manure tank if results from new waste determination sampling shows that concentrations within the tank are at levels greater than the FALs established in the CADD. All concentrations are below these levels for samples collected to date. If soil samples are needed, then a minimum of two samples will be collected, one from below each end of the tank in the areas most likely to have been impacted. After the tank is removed (and closure confirmation samples have been received, if necessary), the excavated area will be backfilled with clean fill.

2.1.1.5 CAS 15-23-01, Underground Radioactive Material Area

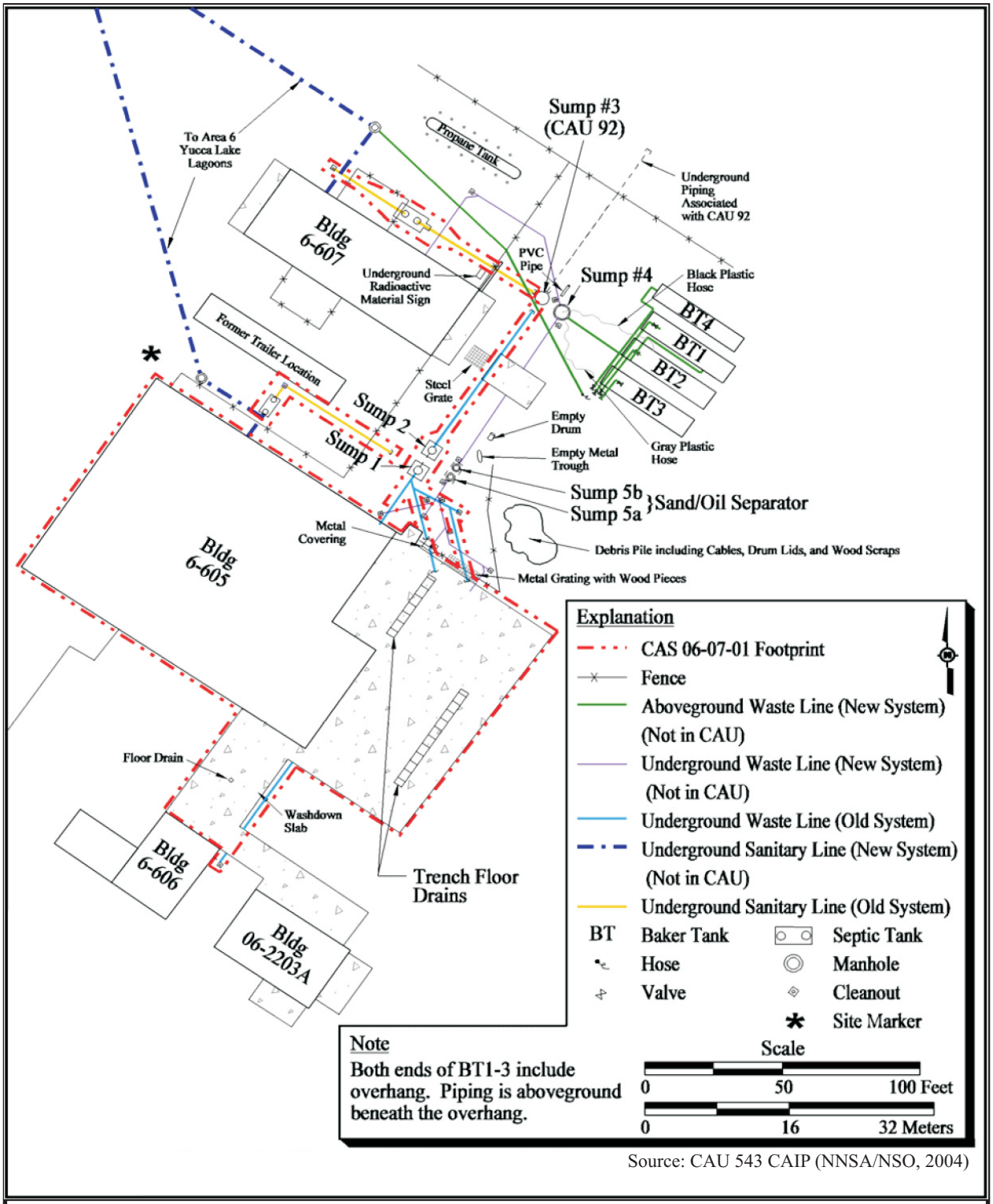
CAS 15-23-01 is located at the former EPA Farm in Area 15 and consists of an area of soil surrounding and underlying a PSP (e.g., grate) measuring approximately 19 by 22 ft. No COCs are present above action levels (NNSA/NSO, 2005). As a BMP, the steel grate and miscellaneous debris will be removed and disposed of as sanitary waste at an appropriate facility. A demarcation survey will be conducted to determine whether or not the Underground Radiological Material Area posting can be downgraded or removed, and appropriate signage will be reestablished around the perimeter of the CAS based on the demarcation survey results, as required by the RadCon Manual (NNSA/NSO, 2004b).

2.1.2 Alternative 3 – Closure in Place with Administrative Controls

The approved corrective action is Closure in Place with Administrative Controls (Alternative 3) for the CASs listed below (NNSA/NSO, 2005).

2.1.2.1 CAS 06-07-01, Decon Pad

CAS 06-07-01 is located at the Decontamination Facility in Area 6 (Figure 2). The CAS consists of the effluent collection and distribution systems for Buildings 6-605, 6-606, and 6-607, which include two 1,000-gal septic tanks, two ground-level sumps and associated piping, the concrete foundation of Building 6-605, floor drains, drain trenches, and cleanouts. Numerous containers are also located within the CAS boundary. As a BMP, containers, drums, and waste within the storage yard will be sampled, if necessary, and disposed of at an appropriate facility. The existing Baker Tanks and associated piping are not considered a part of this CAS.



Source: CAU 543 CAIP (NNSA/NSO, 2004)

FIGURE 2
CAS 06-07-01, DECON PAD

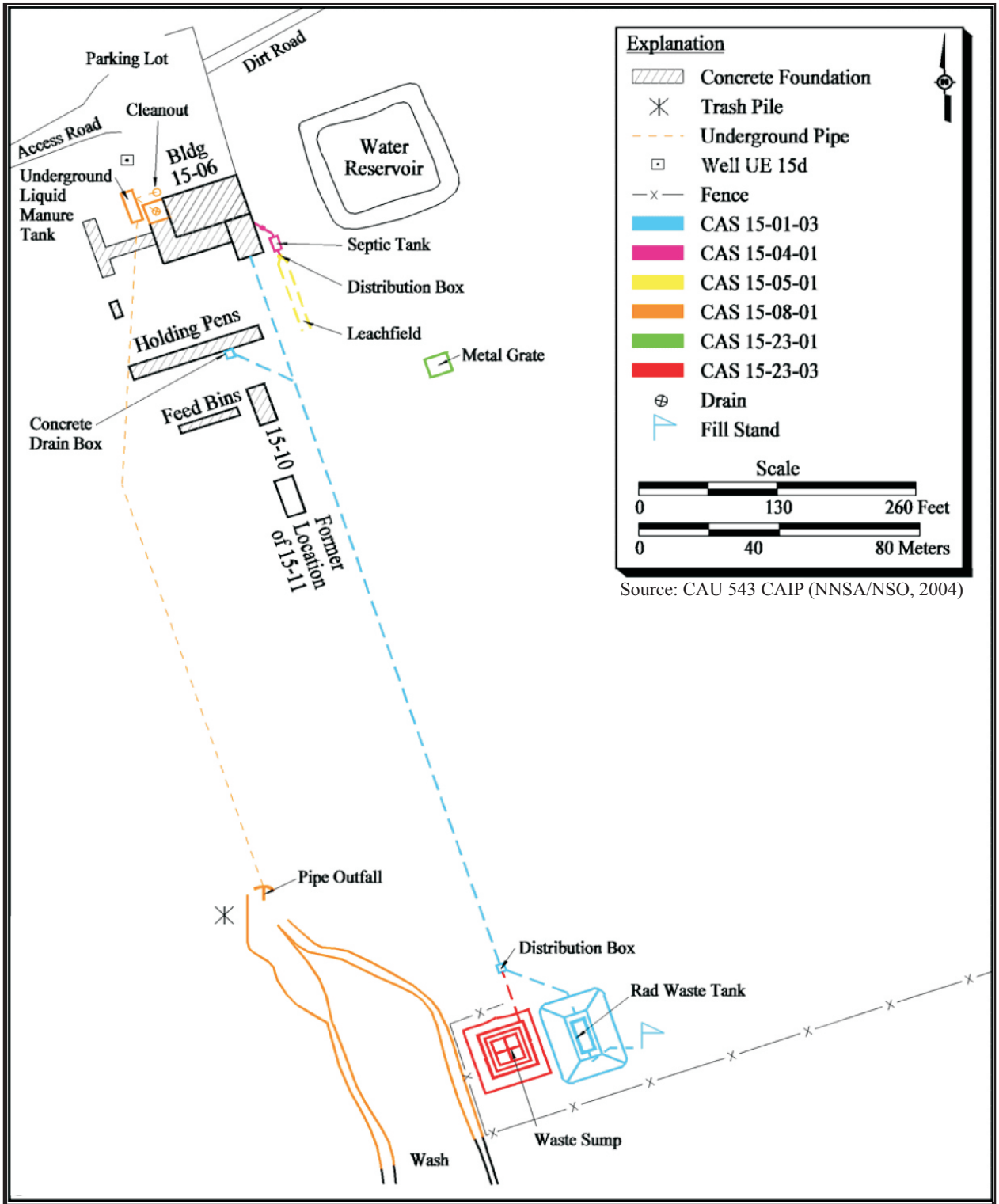
PCBs are present above action levels in the soil around the Decontamination Facility (Building 6-605) foundation and are considered COCs. Sediment within the Building 6-605 floor drains and trenches will be removed and disposed of at the appropriate facility. Analytical results indicate that this sediment contains PCBs at concentration requiring its management as PCB waste. A land UR will be implemented for the area extending 10 lateral ft from the Building 6-605 foundation. The outside perimeter of the area will be fenced, UR warning signs posted according to the FFACO UR posting guidance (FFACO, 2003), and a monitoring program will be implemented to verify that the postings are in place and legible.

As a BMP, the contents of the Building 6-605 septic tank, the Building 6-607 septic tank, Sumps 1 and 2, and the diversion box will be removed from their structures, containerized, and managed and disposed of as mixed waste (MW). The septic tanks, sumps, and associated piping (that comes out when the structures are removed) will then be excavated, removed, containerized, and also managed and disposed of as MW. Soil samples will be collected from beneath the removed septic tanks and sumps to confirm that concentrations are less than the FALs established in the CADD. Samples will be analyzed for those constituents within the structures that are currently at concentrations that could exceed these levels if released to the environment. A minimum of one sample will be collected from below each tank and sump. After confirmation is received, all excavations will be backfilled with NTS clean native fill.

The Building 6-605 floor drains and trenches will be filled with concrete, and all open holes, diversion boxes, and cleanouts will be grouted to grade. Any remaining debris will be radiologically screened and disposed of at the appropriate facility.

2.1.2.2 CAS 15-23-03, Contaminated Sump, Piping

CAS 15-23-03 is located at the former EPA Farm in Area 15 and consists of a sump and associated piping between the sump and the CAS 15-01-03 distribution box. The sump, which was in operation from 1972 to 1981, was used primarily for the collection of liquid waste from the Building 15-06 laboratory. Concentrations of PCBs and plutonium-238 are above action levels in the soil at the sump floor. The site will be closed in place with administrative controls by backfilling and compacting the sump with clean fill material, grading the sump area to prevent precipitation run-on, reestablishing the Underground Radioactive Material Area signs around the perimeter of the sump, implementing a UR for PCBs and radioactive materials, and establishing a monitoring program to ensure that the radiological and UR postings are in place and legible. This UR will include the buried piping between the CAS 15-01-03 distribution box (removed) and the CAS 15-23-03 sump. The Area 15 CASs are shown in Figure 3.



Source: CAU 543 CAIP (NNSA/NSO, 2004)

FIGURE 3
CASs 15-01-03, 15-04-01, 15-05-01, 15-08-01, 15-23-01, AND 15-23-03
LOCATED AT THE AREA 15 EPA FARM

2.2 CONSTRUCTION QUALITY ASSURANCE/QUALITY CONTROL

Construction activities are limited to excavation, backfilling, removal of liquids from the sumps and septic tanks, and solidification of removed liquids. No engineered structures will be constructed as part of site closure. Therefore, a construction quality assurance/quality control (QA/QC) plan will not be required.

2.2.1 Construction Field Sample Collection Activities

Construction field samples are not necessary for the closure of any CASs listed in this CAP, although samples will be collected for waste stream characterization and to confirm that removed structures have not released contaminants in excess of the established FALs. Field sample collection activities are addressed in Section 2.4.

2.2.2 Construction Laboratory/Analytical Data Quality Indicators

CAU 543 closure activities are limited to debris removal, site fencing and posting, non-structural excavation and backfilling, and draining of fluid from septic tanks, distribution boxes, and piping. Therefore, a construction QA/QC plan is not required and construction data quality indicators (DQIs) are not applicable. To ensure that backfill material remains consistent, all fill will be taken from an approved NTS borrow source.

2.3 WASTE MANAGEMENT

All waste will be managed and disposed of in accordance with applicable federal and state regulations, DOE orders, U.S. Department of Transportation, and National Security Technologies, LLC (NSTec), waste management procedures. CAU 543 closure activities are expected to generate sanitary waste/construction debris, hydrocarbon waste, LLW, and MW (i.e., LLW mixed with hazardous waste and/or PCBs). Waste generated during closure activities will be properly managed and shipped to onsite or offsite disposal facilities. Confirmation of waste disposal or transfer to NSTec Waste Generator Services (WGS) for management and disposal shall be included in the CAU 543 Closure Report (CR).

2.3.1 Waste Minimization

All work activities that generate waste will follow the NSTec Waste Minimization and Pollution Prevention Program. Special care will be taken to properly characterize and segregate the waste streams to avoid the generation of additional waste.

2.3.2 Waste Types

Sanitary Waste

Sanitary waste (e.g., non-impacted personal protective equipment [PPE] and general trash) and construction debris (e.g., wood, concrete, metal, plastic) will be generated during closure activities for CAU 543. All sanitary waste removed from sites will be screened for free release (NNSA/NSO, 2004b) and disposed of in an onsite landfill.

Hydrocarbon Waste

All hydrocarbon waste will be analyzed for gamma-emitting radionuclides by either the In-Situ Object Counting System or laboratory analysis, in order to satisfy the landfill disposal restrictions. Upon receipt of the analytical results, the waste will be properly disposed. Any waste meeting the land disposal restrictions as specified in the landfill permit will be disposed in the Area 6 Hydrocarbon Landfill. Hydrocarbon waste not meeting the landfill disposal restrictions for radionuclides will be stored in a waste accumulation area and disposed of as LLW or, if PCBs or hazardous waste constituents are present, as MW.

LLW

Closure activities will include removal of contaminated fluids and sludges, tanks, piping, boxes, and debris impacted with varying combinations of plutonium-238, plutonium-239, americium-241, cobalt-60, cesium-137, uranium-235, uranium-238, and strontium-90. All LLW will be characterized by laboratory analysis, and a profile for disposal will be prepared. Where waste characterization samples collected during the Corrective Action Investigation are adequate to properly characterize and profile the waste, additional samples will not be collected. Where additional analysis is required, samples will be analyzed for those parameters that are missing so as to complete the waste characterization and profile. All LLW shall be managed and disposed in accordance with NSTec Organization Procedure (OP) OP-2151.304, "Radioactive Waste Tracking, Handling, and Management at the NTS" (NSTec, 2007), and all applicable federal and state regulations. All LLW will be packaged in the presence of a Waste Certification Official and WGS personnel according to OP-2151.304 (NSTec, 2007). All LLW will be stored in a Radioactive Materials Area until a waste disposal profile is prepared and approved. The LLW will then be disposed appropriately.

Hazardous Waste

Waste from the CAS 06-07-01 septic system contains volatile organic compounds and other constituents requiring disposal as a hazardous waste. Because this waste also contains LLW, it will be managed as a MW. Hazardous waste, without radioactive waste, could be identified through characterization sampling of containers at CAS 06-07-01. All hazardous waste will be characterized by Hazardous Waste Operations personnel, and a waste profile will be prepared. The waste will be managed and disposed according to all applicable NSTec procedures and state and federal regulations. Upon generation, the waste shall be containerized and stored in a satellite accumulation area or a 90-day hazardous waste accumulation area, depending on the amount of waste generated. After an approved waste profile is generated, the waste will be disposed of at an appropriately permitted treatment, storage, and disposal (TSD) facility.

MW

MW is waste containing both radioactive waste and either hazardous or PCB waste. Because of the solvents used at the Area 6 Decon Facility, sediment, sludge, tanks, and piping at this facility contain LLW and either hazardous waste and/or PCB waste (i.e., MW). All of the hazardous/regulated radiologically impacted materials and PCB/regulated radiologically impacted materials will be considered a MW. Resource Conservation and Recovery Act standards, Radiological Safe Work Practices, and PCB storage requirements apply when handling waste generated from the septic disposal system at CAS 06-07-01.

All MW will be managed and disposed in accordance with OP-2151.304, "Radioactive Waste Tracking, Handling, and Management at the NTS" (NSTec, 2007), and all applicable federal and state regulations. All MW will be packaged in the presence of a Waste Certification Official and WGS personnel according to OP-2151.304 (NSTec, 2007). When staged onsite, the MW will be stored in a Radioactive Materials Area and 90-day hazardous waste accumulation area until a waste disposal profile is prepared and approved. Samples will be collected to enable completion of a treatability study. The MW will then be disposed appropriately.

PPE
All PPE that becomes contaminated during closure activities shall be disposed of with the appropriate corresponding waste stream. All wastes generated during closure activities will be properly disposed of in onsite landfills or at a permitted offsite TSD facility.

Decontamination Waste
Equipment that becomes contaminated during closure activities will be decontaminated onsite. Dry decontamination will be the preferred method. For larger pieces of equipment that cannot be effectively decontaminated using dry decontamination techniques, wet decontamination techniques shall be used over a drum or waste pile. For larger equipment, a decontamination pad consisting of a lined bermed area will be used. The equipment will be driven onto the pad and decontaminated using pressurized water. Smaller equipment and/or tools may be decontaminated with soap and water. All decontamination rinseate will be managed appropriately in accordance with applicable regulations, and once characterized, properly disposed.

2.4 CONFIRMATION OF CORRECTIVE ACTIONS

Accurate and defensible analytical data will be collected to characterize waste and to verify that the closure objectives outlined in this CAP have been met. The completion of BMP activities will be verified via physical observations, visual inspections, image documentation, and waste disposition documentation.

2.4.1 Sample Collection Methods

Because no specific COCs are present at the CAU 543 CASs where excavations are being performed as a BMP, the collection of verification samples is not required during closure of CAU 543. As a BMP, samples will be collected from below buried structures that are removed to confirm that waste contained within the structures is not present in the soil below the structures at concentrations greater than the FALs identified in the CADD. Soil samples will be collected using scoop and trowel or hand auger. Samples that will be collected for analysis as a BMP are discussed in Sections 2.1.1 and 2.1.2. In addition to BMP samples, waste characterization samples will be collected, as needed, to determine the waste type and appropriate disposal method.

All samples will be collected by qualified NSTec Environmental Restoration personnel. All sampling activities will follow Organization Instruction (OI) OI-2152.108, "Soil Sampling" (Bechtel Nevada [BN], 2000b). Sample traceability is established and maintained by completing a chain of custody form, as detailed in OI-2152.100, "Sample Chain of Custody" (BN, 2000a).

Sample collection date, time, and other pertinent information will be logged on a "Service Request and Chain of Custody Record," and placed in a bound project field notebook.

All samples will be collected in clean containers, labeled appropriately, sealed with a tamper-proof seal, bagged, placed on ice in a cooler, and transported to the NSTec Environmental Technical Services group under a sample chain of custody form. The NSTec Environmental Technical Services group will be responsible for sample management and shipment of the samples to an approved offsite laboratory for analysis. Samples will be analyzed by EPA-approved analytical methods at EPA-approved laboratories (EPA, 1996). Sample analysis will include laboratory analysis of QA/QC samples and will follow stringent QA/QC procedures (EPA, 1996). Sample analysis for radioisotopes will be performed in accordance with *Environmental Measurements Laboratory Procedures Manual* (DOE, 1997).

One set of QA/QC samples will be collected for every 20 environmental samples. QA/QC samples will include blind duplicates and matrix spike/matrix spike duplicates. The blind duplicate will be labeled with a unique sample number.

2.4.2 Laboratory/Analytical Data Quality Objectives

Data quality objectives (DQOs) are qualitative and quantitative statements that specify the quality of the data required to support closure of a site. The DQOs for CAU 543 site investigations were defined in the CAIP (NNSA/NSO, 2004a) using the seven-step DQO process developed by EPA (EPA, 2000). The conceptual site models for the CAU 543 CASs were defined in the CAIP (NNSA/NSO, 2004a), and these models were reconciled with the results of the site investigation in the CADD (NNSA/NSO, 2005). (See Appendix A of the CADD.)

Sample analytical results may be generated by analysis of waste characterization samples and verification soil samples collected during closure activities for most CASs that involve excavations. All laboratory data generated during closure activities will be reviewed by project personnel, to ensure the data are usable and complete according to the CAU 543 DQOs. In addition, as specified in the *Industrial Sites Quality Assurance Project Plan* (NNSA/NV, 2002), a minimum of 100 percent of the final data packages for verification samples will be evaluated at the Tier I and Tier II levels using the applicable OIs. These include OI-2151.303 (BN, 2004) for validating radiological data, and OI-2154.459 (BN, 2005) for validating inorganic chemical data. OI-2154.459 is based on EPA Functional Guidelines (EPA, 2002). Any data determined not to be valid will be identified in the CR. More details on the proposed number and location of the verification samples are given in Sections 2.1.1 and 2.1.2 of this CAP.

DQIs are qualitative and quantitative statements that specify the data requirements of a project. The DQIs include precision, accuracy completeness, representativeness, comparability, and sensitivity. These DQIs are discussed below.

Precision

Precision is a measure of agreement among a replicate set of measurements of the same property under similar conditions. This agreement is expressed as the relative percent difference (RPD) between duplicate measurements (EPA, 1996). Precision applies to parameters sampled and analyzed in duplicate.

One duplicate sample will be collected per set of 20 or fewer verification samples. All duplicate samples will be collected from the same medium and analyzed for the same set of analytes as verification samples. The precision of the analytical results will be assessed by calculating the RPD for a verification sample and its duplicate sample results. An RPD of less than or equal to 30 percent indicates acceptable precision (NNSA/NV, 2002).

Accuracy/Bias

Accuracy is a measure of the closeness of an individual measurement or the average of a number of measurements to the true value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that result from sampling and analytical operations. This closeness is represented as percent recovery (%R) (EPA, 1996). Accuracy will be assessed by examining the %R of laboratory control and spiked samples. A %R within the range of 70-130 percent indicates satisfactory analytical accuracy (NNSA/NV, 2002).

Representativeness

Representativeness is a qualitative evaluation of measurement system performance. It is the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition (EPA, 1996). Representativeness will be attained by ensuring that the sample locations, analytical parameters, analytical methods, sampling protocols, and sample handling all meet the project-specific objectives.

Comparability

Comparability is a qualitative measure that expresses the confidence that one data set can be compared to another. It will be achieved by using standardized field sampling procedures and analytical methods for sample analysis. Sample results will be reported in standard units to allow for comparison of the data.

Completeness

Completeness is a quantitative measure of data quality expressed as the percentage of valid data obtained that satisfies the project-specific requirements. Because a limited number of samples will be collected for both waste characterization and verification of closure, 100 percent of the data collected needs to be of acceptable quality to maintain acceptable QA/QC standards.

Sensitivity

Sensitivity is the capability of a method or instrument to discriminate between measurement responses representing different levels of a variable of interest. This indicator is determined

from the value of the standard deviation at the concentration level of interest. It represents the minimum difference of concentration that can be distinguished between two samples with a high degree of confidence. Sensitivity must be sufficient to detect contaminants at or below decision levels. Sensitivity will be achieved by analyzing all samples using appropriate EPA-approved analytical laboratories, methods, and instruments.

2.5 PERMITS

Prior to beginning field closure activities, planning documents and permits will be prepared. These documents will include a Field Management Plan, *National Environmental Policy Act* (NEPA) Checklist, NNSA/NSO Real Estate/Operations Permit (REOP), Radiological Work Permits (RWP), excavation permits, and blind penetration permits.

NEPA Checklist

A NEPA Checklist will be completed prior to all excavation activities at the site. Excavation activities will follow all applicable federal, state, and local laws, regulations, and permits regarding protection of the environment.

NNSA/NSO REOP

A REOP will be obtained prior to beginning closure activities. The permit will establish the NNSA/NSO as the prime authority possessing control of the site.

RWP

RWPs will be required for work at any radiologically impacted site when radiological conditions require, as determined by NSTec Health Physics. RWPs will inform workers of the specific PPE necessary to protect them while performing their tasks and identify site-specific controls. The workers will be required to sign the permits and acknowledge their understanding of the requirements before entry into any contamination area, if present. The RWPs will be maintained by Radiological Control Technicians at the entrance to the contamination area. All site workers will be required to be Radiation Worker II-trained to perform any work within a radiologically controlled area.

Excavation Permits and Blind Penetration Permits

An excavation permit will be obtained prior to beginning any excavation activities. These permits require that a utility clearance also be performed. A copy of the permit will be filed on the site throughout the duration of the project.

3.0 SCHEDULE

All preparation and field activities are scheduled for completion in Fiscal Year 2007. The FFACO deadline for delivery of the CR to the Nevada Division of Environmental Protection (NDEP) is January 31, 2008. Sufficient flexibility has been incorporated into the field schedule to allow for minor difficulties (e.g., weather, equipment failure). The NNSA/NSO shall notify the NDEP of any condition or event that may impact the project schedule.

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4.0 POST-CLOSURE PLAN

Corrective Action Alternative 3, Closure in Place with Administrative Controls, requires post-closure site inspections. The Administrative Controls will include implementing URs at CAS 06-07-01 and CAS 15-23-03 to prohibit any unauthorized intrusive activities. A UR will also be implemented for the Building 15-06 pad and underground piping of CAS 15-01-03 to require the area to remain low-occupancy because of PCBs greater than 1 ppm, and the building pad will be fenced because of PCBs greater than 25 ppm.

4.1 INSPECTIONS

Annual inspections will be completed at CASs 06-07-01, 15-01-03, and 15-23-03. Inspections consist of annual (yearly) visual inspections of the fencing and postings to verify that the fence is in good condition, that the postings are in place and readable, and that the URs are maintained. Any identified maintenance and repair requirements will be reported to NDEP and maintenance scheduled within 90 working days of discovery.

Results of all inspections in a given year will be included in the annual NTS Industrial Sites Post-Closure letter report. The annual letter report will include the following information:

- Discussion of observations and inspections
- Copies of the site inspection checklists
- Any maintenance records

A copy of each annual letter report will be submitted to NDEP.

4.2 MONITORING

Because no sampling or collection of data will be performed after closure of the CAU, no post-closure monitoring is required for these CASs. Annual visual inspection will be performed for the CASs identified in Section 4.1, "Inspections."

4.3 MAINTENANCE AND REPAIR

If any maintenance and repair requirements are identified during the annual inspection of CASs 06-07-01, 15-01-03, and 15-23-03, NDEP will be notified, funding will be requested, and the repairs scheduled. Any repair or maintenance performed at this site shall be documented in writing at the time of the repair and included in the annual letter report.

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5.0 REFERENCES

BN, see Bechtel Nevada.

Bechtel Nevada. 2000a. Organization Instruction OI-2152.100, "Sample Chain of Custody." Las Vegas, NV.

Bechtel Nevada. 2000b. Organization Instruction OI-2152.108, "Soil Sampling." Las Vegas, NV.

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DOE, see U.S. Department of Energy.

EPA, see U.S. Environmental Protection Agency.

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U.S. Department of Energy. 1997. *Environmental Measurements Laboratory Procedures Manual*, HASL-300, 28th Ed., Vol. 1. New York, NY.

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U.S. Department of Energy, National Nuclear Security Administrations Nevada Site Office. 2004b. *NV/YMP Radiological Control Manual*, DOE/NV/11718-079, Rev. 5. Las Vegas, NV.

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U.S. Environmental Protection Agency. 2000. *Guidance for Data Quality Assessment: Practical Methods for Data Analysis*, EPA QA/G-9, EPA/600/R-96/055. Washington, D.C.

U.S. Environmental Protection Agency. 2002. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA/540/R-94/013. Washington, D.C.

APPENDIX A.1

ENGINEERING SPECIFICATIONS AND DRAWINGS

NOTE: Engineering specifications and drawings are not required for closure of CAU 543. This Appendix is included here as required by the approved *Federal Facility Agreement and Consent Order* outline for a Corrective Action Plan.

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APPENDIX A.2

SAMPLING AND ANALYSIS PLAN

NOTE: Sufficient details on the type, number, and location of verification samples to be collected to verify site closure activities has been provided in Section 2.4, "Confirmation of Corrective Actions." This Appendix is included here as required by the approved *Federal Facility Agreement and Consent Order* outline for a Corrective Action Plan.

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APPENDIX A.3
PROJECT ORGANIZATION

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PROJECT ORGANIZATION

The U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office (NNSA/NSO) Federal Sub-Project Director is Kevin Cabble, and his telephone number is (702) 295-5000.

The identification of the project Health and Safety Officer and the Quality Assurance Officer can be found in both the Field Management Plan and the Site-Specific Health and Safety Plan. However, personnel are subject to change, and it is suggested that the appropriate NNSA/NSO Project Manager be contacted for further information. The Task Manager will be identified in the *Federal Facility Agreement and Consent Order* Monthly Activity Report prior to the start of field activities.

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