**CLOSURE REPORT
FOR CORRECTIVE ACTION UNIT 335:
AREA 6 INJECTION WELL AND DRAIN PIT,
NEVADA TEST SITE, NEVADA**

**Prepared for:
U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office
Work Performed Under Contract No. DE-AC08-96NV11718**

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Revision: 0

June 2003

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FOR CORRECTIVE ACTION UNIT 335:
AREA 6 INJECTION WELL AND DRAIN PIT,
NEVADA TEST SITE, NEVADA**

Approved by:

Janet Appenzeller-Wing, Project Manager
Industrial Sites Project

Date:

6/25/03

Approved by:

Runore C. Wycoff, Director
Environmental Restoration Division

Date:

6/25/03

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ACRONYMS AND ABBREVIATIONS

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 of Concern
CR	Closure Report
CSM	Conceptual Site Model
DOE/NV	U.S. Department of Energy, Nevada Operations Office
DQO	Data Quality Objectives
ft	foot (feet)
FFACO	Federal Facility Agreement and Consent Order
km	kilometer(s)
m	meter(s)
mg/kg	milligram(s) per kilogram
mi	mile(s)
NDEP	Nevada Division of Environmental Protection
NNSA/NSO	U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office
NNSA/NV	U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office
NTS	Nevada Test Site
SDG	Sample Delivery Group
TPH	Total Petroleum Hydrocarbons

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EXECUTIVE SUMMARY

Corrective Action Unit (CAU) 335: Area 6 Injection Well and Drain Pit, is located in Area 6 of the Nevada Test Site (NTS). CAU 335 consists of three Corrective Action Sites (CASs) currently listed in Appendix III of the Federal Facility Agreement and Consent Order (FFACO, 1996):

- CAS 06-20-01, Drums; Oil Waste; Spill
- CAS 06-20-02, 20-inch Cased Hole
- CAS 06-23-03, Drain Pit

CAU 335 was closed in accordance with the FFACO and the Nevada Division of Environmental Protection-approved Corrective Action Plan for CAU 335 (U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office [NNSA/NV], 2002). CAU 335 was closed by implementing the following corrective actions:

- CAS 06-20-01 is a spill site associated with the storage of material that was pumped out of CAS 06-20-02 and placed into 208-liter (55-gallon) drums. The drums were transported to the NTS Area 5 Hazardous Waste Accumulation Site in 1991 (U.S. Department of Energy, Nevada Operation Office [DOE/NV], 2000). Any spills associated with CAS 06-20-01 were addressed and considered part of CAS 06-20-02. CAS 06-20-01 was closed by taking no further action.
- CAS 06-20-02 is a 20-inch cased hole that was used for disposal of used motor oil, waste water, and debris for an undetermined amount of time (DOE/NV, 2000). This site was closed in place with administrative controls. Warning signs were posted along the CAS perimeter and land use restrictions implemented to prevent intrusive activities at the site.
- CAS 06-23-03 consists of a drain pit that was used as a depository for effluent waste from truck-washing facilities from 1960 through 1991 (DOE/NV, 2000). This site was closed in place with administrative controls. The exposed piping in the drain pit berm was grouted closed and the drain pit backfilled with approximately 190 cubic meters (250 cubic yards) of clean fill. Warning signs were posted along the CAS perimeters and land use restrictions implemented to prevent intrusive activities at the site.

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1.0 INTRODUCTION

This Closure Report (CR) documents the activities undertaken to close Corrective Action Unit (CAU) 335: Area 6 Injection Well and Drain Pit, according to the Federal Facility Agreement and Consent Order (FFACO, 1996). CAU 335 was closed in accordance with the Nevada Division of Environmental Protection (NDEP)-approved Corrective Action Plan (CAP) for CAU 335 (U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office [NNSA/NV], 2002).

CAU 335 is located in Area 6 of the Nevada Test Site (NTS), which is approximately 105 kilometers (km) (65 miles [mi]) northwest of Las Vegas, Nevada (see Figure 1). CAU 335 consists of three Corrective Action Sites (CASs) located in the Area 6 Well 3 Yard approximately 39 km (24 mi) north of Mercury, Nevada, approximately 100 meters west of Mercury Highway along Road 6-06 (Figure 2).

1.1 PURPOSE

The purpose of this CR is to document that the closure of CAU 335 complied with all of the closure requirements detailed in the NDEP-approved CAP (NNSA/NV, 2002).

The site history for CAU 335 is provided in the CAU 335 Corrective Action Investigation Plan (CAIP) (U.S. Department of Energy, Nevada Operations Office [DOE/NV], 2000). The site history is briefly summarized below.

CAS 06-20-01 was used for storing material that was pumped out of CAS 06-20-02 and placed into four 208-liter (55-gallon) drums. The drums were taken to the NTS Area 5 Hazardous Waste Accumulation Site in 1991 (DOE/NV, 2000). Any spills associated with CAS 06-20-01 were addressed and considered part of CAS 06-20-02.

CAS 06-20-02 consisted of a 51-centimeter (20-inch) cased hole. The cased hole was used for disposal of used motor oil, waste water, and debris for an undetermined amount of time. In 1991 the casing was emptied of its contents, excavated, and backfilled (DOE/NV, 2000).

CAS 06-23-03 consisted of a drain pit which was used for disposal of effluent waste from truck-washing activities from 1960 through 1991 (DOE/NV, 2000).

CAU 335 site characterization investigation activities were performed in 2001 and the results are reported in the CAU 335 Corrective Action Decision Document (CADD) (NNSA/NV, 2001). Analytical results for soil samples collected during site characterization indicated that total petroleum hydrocarbons (TPH) as diesel range organics were the only contaminants of concern (COC) present above action levels. TPH concentrations exceeded the Nevada State regulatory action level of 100 milligrams per kilogram (mg/kg) (Nevada Administration Code [NAC], 2003) at all three CASs. No other COC were detected above action levels at the three CASs.

FIGURE 1
NEVADA TEST SITE AND CAU 335 LOCATION MAP

CAU 335 was closed by the following activities:

- CAS 06-20-01 was closed by taking no further action
- CAS 06-20-02 was closed in place with administrative controls by posting warning signs along the CAS perimeter and implementing land use restrictions (Appendix B).
- CAS 06-23-03 was closed in place with administrative controls by grouting closed some exposed piping, backfilling the drain pit with clean fill, posting warning signs along the CAS perimeters and implementing land use restrictions (Appendix B).

1.2 SCOPE

The closure strategy for CAU 335 was specified in the NDEP-approved CAP for CAU 335 (NNSA/NV, 2002). The implemented closure strategy consisted of the following activities.

Based on the results of the site characteristic sampling, process knowledge, an "A through K" risk evaluation, and the results of the Data Quality Objectives (DQOs) identified in the CADD (NNSA/NV, 2001), CAS 06-20-01 was closed by taking no further action, and CASs 06-20-02 and 06-23-03 were closed in place with administrative controls.

1.3 CLOSURE REPORT CONTENTS

This CR is divided into the following sections:

- Section 1.0- Introduction
- Section 2.0- Closure Activities
- Section 3.0- Waste Disposition
- Section 4.0- Closure Verification Results
- Section 5.0- Conclusions and Recommendations
- Section 6.0- References

The appendices included in this CR include the following:

- Appendix A- Data Quality Objectives for CAU 335
- Appendix B- Use Restriction Forms
- Appendix C- Photographs of Closure Activities
- Appendix D- Sample Analytical Results

- Appendix E- Closure Certification
- Appendix F- As-Built Documentation
- Appendix G- Modification to the Post-Closure Plan
- Appendix H- Nevada Environmental Restoration Project Document Review Sheet
- Distribution List

Appendices D, E, F and G are included in this CR because they are listed in the approved FFACO CR outline (FFACO, 1996). CAU 330 was closed in place with administrative controls. Implementing this closure option did not require collecting confirmation samples, closure certification, constructing engineered structures, or modifying the Post-Closure Plan. Therefore, Appendices D, E, F and G are not applicable to the closure of CAU 335. Place holders for these appendices are included in this CR to meet the approved FFACO CR outline requirements.

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

- Corrective Action Investigation Plan for Corrective Action Unit 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada (DOE/NV, 2000).
- Corrective Action Decision Document for Corrective Action Unit 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada (NNSA/NV, 2001).
- Corrective Action Plan for Corrective Action Unit 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada (NNSA/NV, 2002).

1.3.1 Data Quality Objectives

The DQOs used for closing CAU 335 were generated from initial investigation observations and analytical results for samples collected during the site characterization of each CAS. The DQOs primary conceptual site model (CSM) defined the expected nature and extent of the contamination present at each CAS. All assumptions, based on the nature and extent of contamination, in the CSM (Section 4.1; Appendix A) were confirmed through sample analysis at the CASs as documented in the CADD (NNSA/NV, 2001).

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2.0 CLOSURE ACTIVITIES

This section details the specific corrective action activities completed during the closure of CAU 335: Area 6 Injection Well and Drain Pit.

2.1 DESCRIPTION OF CORRECTIVE ACTION ACTIVITIES

2.1.1 Preplanning and Site Preparation

Closure of CAU 335 was completed using the NDEP-approved CAP (NNSA/NV, 2002). Prior to beginning site closure activities, the following pre-field activities were completed:

- Preparation of a National Environmental Policy Act documentation (checklist).
- Preparation of the Field Management Plan for Corrective Action Unit 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada, (Bechtel Nevada [BN], 2003).
- Preparation of a U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office (NNSA/NSO) Real Estate/Operations Permit.
- Preparation of Job Hazard Analysis as the safety basis authorization for site closure work.
- Completion of a utility survey of the work area where tee-posts were to be placed.
- Preparation of BN Blind Penetration Permit prior to placing tee-posts.

2.1.2 CAS 06-20-01: Drums; Oil Waste; Spill

The previously identified drums were removed from the site in 1991 (DOE/NV, 2000). Any spills associated with CAS 06-20-01 were addressed as part of the closure of CAS 06-20-02. This CAS was closed by taking no further action.

2.1.3 CAS 06-20-02: 20-inch Cased Hole Closure Activities

CAS 06-20-02 was closed in place with administrative controls. CAS 06-20-02, as identified in the NDEP-approved CADD (NNSA/NV, 2001), was split into a large area south of Road 6-06, and a small area located immediately north of Road 6-06 (Figure 3). A utility survey of the sites where tee-posts were to be placed was conducted prior to posting. Following the utility survey, tee-posts with attached warning signs were placed along the perimeter of the areas approximately every 30.5 meters (m) (100 feet [ft]). All signs warn of the presence of TPH contaminated soil, list contact information, and face out away from the use restricted area. The corners and turning points of both the north and south areas were surveyed. The corner coordinates are given on the CAU Use Restriction Information form included in Appendix B. The use restrictions were implemented to prevent inadvertent intrusion or exposure to contaminated soil.

2.1.4 CAS 06-23-03: Drain Pit Closure Activities

CAS 06-23-03 was closed in place with administrative controls. The exposed pipes protruding from the drain pit berm were grouted closed and the drain pit backfilled with approximately 190 cubic meters (250 cubic yards) of clean fill. The backfill was compacted by wheel rolling and graded to a surrounding slope.

After backfilling the drain pit, a utility survey of the sites where tee-posts were to be placed was conducted. Following the utility survey, tee-posts with attached warning signs were placed every 30.5 m (100 ft) along the perimeter of the area identified in the NDEP-approved CADD (NNSA/NV, 2001). All signs warn of the presence of TPH contaminated soil, list contact information, and face out away from the restricted area. Warning signs were placed at the four corners and at the mid-point of each side of the area (Figure 3). The corner locations for CAS 06-23-03 were surveyed for implementing use restrictions. The corner coordinates are given on the CAU Use Restriction Information form included in Appendix B. The use restrictions were implemented to prevent inadvertent intrusion or exposure to contaminated soil.

2.2 DEVIATIONS FROM CORRECTIVE ACTION PLAN AS APPROVED

There were no deviations from the NDEP-approved CAP (NNSA/NV, 2002).

2.3 CORRECTIVE ACTION SCHEDULE AS COMPLETED

The corrective action field activities began in May 2003 and were completed in June 2003. Dates for the closure field activities are provided below.

Utility Surveys	May 22, 2003
Grout Drain Pipe	May 27, 2003
Backfill Drain Pit	May 27, 2003
Install T-posts and warning signs	May 27, 2003
Collect survey points	May 27 and June 16, 2003

2.4 SITE PLAN/SURVEY PLAN

CASs 06-20-02 and 06-23-03 were closed in place with administrative controls, that is, implementing use restrictions. Appendix B includes a Figure giving the site coordinates for the use restriction boundaries. Because engineered construction was not required for site closure, as-built drawings are not included in this CR.

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3.0 WASTE DISPOSITION

During the closure of CAU 335, only sanitary waste was generated. All sanitary waste was disposed of in appropriate waste containers.

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4.0 CLOSURE VERIFICATION

The number of characterization samples that were collected and analyzed during the CAU 335 site characterization phase were adequate to validate the CSM developed for the CASs in the DQOs (DOE/NV, 2000) and to support the selected site closure alternatives: no further action, and closure in place with administrative controls (NNSA/NV, 2001). No verification samples were required to implement the selected site closure alternative or to verify that CAU 335 had been closed in accordance with requirements of the CAP.

4.1 DATA QUALITY ASSESSMENT

The DQOs used for closing CAU 335 in place with administrative controls were generated from initial site investigation observations and site characterization sample analysis data collected from each CAS.

The DQOs CSM defined the expected nature and extent of the contamination present at the

- CAU 335 sites. The CSM, as specified in the CAIP (DOE/NV, 2000), assumed the following. The contaminants of potential concern, if present, were associated with the disposal of used motor oil and wastewater in the Cased Hole, and effluent discharge from truck washing activities into the Drain Pit.
- Contamination, if present, was confined laterally within the boundaries of the Cased Hole and Drain Pit, and was confined vertically to 4.5 m (15 ft) below ground surface at the Cased Hole and 3 m (10 ft) below the bottom of the Drain Pit.
- Radionuclides were not anticipated in the Cased Hole or Drain Pit.

All assumptions in the CSM were confirmed through sample analysis at both CASs as documented in the CADD (NNSA/NV, 2001). Characterization samples collected and analyzed showed that TPH was the only COC detected above the action limits. TPH contamination in the Area 6 Well 3 Yard can be attributed to releases associated with each CAS, as well as more widespread contamination attributed to past activities at the yard, particularly the use of motor oil for dust suppression.

4.2 USE RESTRICTIONS

Use restrictions were implemented for CAS 06-20-02 and CAS 06-23-03. The only COC detected at CAU 335 was TPH in the diesel/oil range. A summary of the sample analytical data is presented in the CAU 335 CADD (NNSA/NV, 2001). From this data, the boundaries of the TPH contaminated areas were determined for the Injection Well and Drain Pit sites (Figure 3). The Use Restriction forms and figures showing the location of the corner points for each CAS are included in Appendix B.

The future use of any land related to CAU 335, as described in Appendix B, is restricted from any activity that may alter or modify the containment control as approved by NDEP and identified in this CR or other documentation for this CAU, unless appropriate concurrence is obtained in advance.

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5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSION

Closure of CAU 335 was accomplished according to the NDEP-approved CAP (NNSA/NV, 2002). CAS 06-20-01 was closed by taking no further action. CASs 06-20-02 and 06-23-03 were closed in place with administrative controls. The following closure activities were performed at CAU 335 and are documented in the CR.

CAS 06-20-01

The previously identified drums were removed from the site in 1991 (DOE/NV, 2000). Any spills associated with CAS 06-20-01 were addressed as part of the closure of CAS 06-20-02. This site was closed by taking no further action.

CAS 06-20-02

This site was closed in place with administrative controls. Tee-posts and warning signs were installed along the perimeter of TPH contaminated areas south and north of Road 6-06 (Figure 3). The corner locations of the posted areas were surveyed and land use restrictions implemented.

CAS 06-23-03

This site was closed in place with administrative controls. Exposed pipes in the Drain Pit berm were grouted closed, the pit backfilled with clean fill, and wheel rolled and graded to the surrounding topography. After the open Drain Pit was backfilled, tee-posts and warning signs were installed around the perimeter of the TPH contaminated area. The corner locations of the posted area was surveyed and land use restrictions implemented.

5.2 POST-CLOSURE MONITORING REQUIREMENTS

The proposed post-closure monitoring consists of annual visual inspections of the signs for two years to verify that they are in place and readable, and that use restrictions are maintained. Any identified maintenance and repair requirements will be reported to NNSA/NSO and the NDEP. Maintenance will be completed within 90 working days of discovery. Results of all inspections for a given year will be included in a single letter report submitted annually to the NDEP. If after two years, monitoring indicates that no further maintenance is necessary, the NNSA/NSO may propose to the NDEP a change in the site post-closure monitoring frequency.

5.3 RECOMMENDATIONS

Based on completion of site closure activities as documented by this CR, it is requested that a notice of completion be provided by the NDEP for CAU 335. Upon closure approval, CAU 335 will be promoted from Appendix III to Appendix IV of the FFACO (1996), "Closed Corrective Action Units."

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6.0 REFERENCES

BN, see Bechtel Nevada.

Bechtel Nevada, 2003. Field Management Plan for Corrective Action Unit 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada, Las Vegas, NV.

DOE/NV, see U.S. Department of Energy, Nevada Operations Office.

FFACO, see Federal Facility Agreement and Consent Order.

Federal Facility Agreement and Consent Order. 1996 as amended. Agreed to by the State of Nevada, the U.S. Department of Energy, and the U.S. Department of Defense.

Nevada Administration Code, 2003. Section 445A.2272, "Contamination of Soil: Establishment of Action Levels." Carson City, NV.

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

U.S. Department of Energy, Nevada Operations Office. 2000. Corrective Action Investigation Plan for Corrective Action Unit 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada, DOE/NV--663 Rev. 0, Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office. 2001. Corrective Action Decision Document for Corrective Action Unit 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada, DOE/NV--759 Rev. 0, Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office. 2002. Corrective Action Plan for Corrective Action Unit 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada, DOE/NV--820 Rev 1, Las Vegas, NV.

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APPENDIX A

DATA QUALITY OBJECTIVES FOR CAU 335*

* As presented and published in the approved Corrective Action Investigation Plan for Corrective Action Unit 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada, DOE/NV--663, Rev. 0. Las Vegas, NV.

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A.1.0 Introduction

A.1.1 Problem Statement

Potentially hazardous and/or radiological constituents may have been discharged into two of the three CASs that comprise CAU 335, Area 6 Injection Well and Drain Pit. Used motor oil, potentially contaminated wastewater of unknown origin, and solid debris were disposed into CAS 06-20-02, 20-inch Cased Hole (Haworth, 1990). The TPH as waste oil was detected at 17,000 ppm in a surface soil sample and at 130 ppm in a soil sample collected from the bottom of the Cased Hole at 8 ft bgs (Clark, 1991). Both of these concentrations exceed the TPH action level of 100 ppm (NAC, 2000). Effluent from truck-washing operations was discharged into CAS 06-23-03, Drain Pit. The effluent contained fuels (diesel and gasoline), motor oil, grease, cleaning additives, and possibly radionuclides (DOE, 1988; Sanders, 1995). The Drain Pit has not been sampled so analytical data are not available.

The third CAS in this CAU is CAS 06-20-01, Drums; Oil Waste; Spill. This CAS consisted of four 55-gallon drums containing material pumped from CAS 06-20-02, 20-inch Cased Hole. Historical documents show that the drums were transported to the Area 5 Hazardous Waste Accumulation Site in July 1991 (REECo, 1992). Since the drums are no longer on site, the CAS will be closed with no further action required as detailed in the forthcoming Closure Report for this CAU. Any spills that may have been associated with this CAS will be investigated under CAS 06-20-02, 20-inch Cased Hole.

Existing information about the nature and extent of contamination at the Cased Hole and Drain Pit is insufficient to evaluate and select preferred corrective actions. The CAU 335 investigation will be based on the DQOs developed by representatives of the NDEP and DOE/NV. This investigation will determine if COPCs are present in concentrations exceeding regulatory levels in the soils around the Cased Hole and Drain Pit. If COPCs are detected, the lateral and vertical extent of contamination will be delineated. Data adequate to close the site under State of Nevada regulations, RCRA, and DOE requirements will be collected.

A.1.2 DQO Kickoff Meeting

Table A.1-1 lists the participants present at the FFACO-required DQO Kickoff Meeting. The goal of the DQO process is to establish the quantity and quality of environmental data required to support

**Table A.1-1
DQO Kickoff Meeting Participants**

Participant	Affiliation	Meeting Date
		Kickoff Meeting 07/13/00
Stacey Alderson	ITLV	X
Clayton Barrow	DOE/NV	X
John Davis	ITLV	X
Cynthia Dutro	ITLV	X
Sylvan Hersh	ITLV	X
Curtis Obi	BN	X
Charles Orchard	ITLV	X
Shannon Parsons-DePry	BN	X
Carrye Putz	ITLV	X
Greg Raab	NDEP	X
Trenton Richards	ITLV	X
Milinka Watson-Garrett	ITLV	X
Jeanne Wightman	ITLV	X

BN - Bechtel Nevada
DOE/NV - U.S. Department of Energy, Nevada Operations Office
ITLV - IT Corporation, Las Vegas
NDEP - Nevada Division of Environmental Protection

corrective action decisions for CAU 335. The process ensures that the information collected will provide sufficient and reliable information to identify, evaluate, and technically defend the chosen corrective action. Unless otherwise required by the results of this DQO and stated in the CAIP, this investigation will adhere to the Industrial Sites QAPP (DOE/NV, 1996).

A.2.0 Conceptual Model

Unknown concentrations and volumes of hydrocarbons, chemical constituents, and radionuclides may have been released in surface and subsurface soils at two of the three CASs within CAU 335. These releases resulted from the disposal of used motor oil, potentially contaminated wastewater, and solid debris in a vertically emplaced well casing, CAS 06-20-02, 20-inch Cased Hole. The motor oil and wastewater may have contaminated surface and subsurface soils either during disposal practices or as a result of leaks in the casing. In addition, effluent from truck-washing operations was discharged into an unpermitted and unlined drain pit, CAS 06-23-03. This effluent may have contained hazardous and/or radiological constituents that may have contaminated surface and subsurface soils in the vicinity of the Drain Pit. Piping associated with the Drain Pit may also be contaminated.

Spills may have been associated with four 55-gallon drums (CAS 06-20-01, Drums; Oil Waste; Spill) that were staged around the Cased Hole for approximately nine months. Since the drums were removed to the Area 5 Hazardous Waste Accumulation Site in July 1991, any potential spills associated with the drums will be investigated under CAS 06-20-02, 20-inch Cased Hole. Section 2.0 of the CAIP provides additional information regarding the site, such as the operational history, waste inventories, release information, and investigative backgrounds.

Diagrammatic sketches of CAS 06-20-02, 20-inch Cased Hole, and CAS 06-23-03, Drain Pit, are provided in Figures A.2-1 and A.2-2, respectively. The conceptual model for CAU 335 is provided in Table A.2-1.

Figure A.2-1
Diagrammatic Sketch of CAS 06-20-02, 20-inch Cased Hole

Figure A.2-2
Diagrammatic Sketch of CAS 06-23-03, Drain Pit

Table A.2-1
Conceptual Model for CAU 335, Area 6 Injection Well and Drain Pit
(Page 1 of 4)

Conceptual Model Element	Descriptions/Assumptions	Source
Drums; Oil Waste; Spill (06-20-01)	This CAS was located in the Well 3 Yard, south of Road 6-06 in Area 6 of the NTS. It was located approximately 10 ft from the northeast corner of Building 6-388, occupying the same location as CAS 06-20-02.	Site investigation
	In October 1990, REECo investigated this location and found a well casing containing oil, water, and debris (associated CAS 06-20-02). The contents of the casing were pumped out and containerized. Approximately 100 gal of water were removed and placed in two 55-gal drums. Twenty gal of used motor oil were removed and placed in one 55-gal drum. Assorted solid debris was removed and placed in one 55-gal drum.	Haworth, 1990
	One oil sample and one water sample were collected. Laboratory analysis found concentrations of VOCS, SVOCs, and RCRA metals, all below PALs.	Haworth, 1990 REECo, 1990
	The four drums were removed to the Area 5 HWAS in July 1991. The drums are not on site.	REECo, 1992 Site investigation
	This CAS will be closed in the Closure Report for this CAU and will require no further action.	NA
20-inch Cased Hole (06-20-02)	This CAS is located in the Well 3 Yard, south of Road 6-06 in Area 6 of the NTS. It is located approximately 10 ft from the northeast corner of Building 6-388.	Site investigation
	The Cased Hole was used to dispose used motor oil, possibly contaminated wastewater, and various solid debris. The origin of this waste is unknown. It is unknown when the well casing was installed.	Process knowledge
	The Cased Hole was excavated in July 1991. It was described as a 9-ft long, 20-in. diameter steel casing with a welded and sealed bottom. When excavated, it was noted to be in good condition with no evidence of degradation. Currently, the site is described as a 5-ft diameter, 3-in. high mound of soil with no surface staining or odor.	Process knowledge REECo, 1992 Site investigation
	Two soil samples were collected during excavation. One sample was collected from the surface and was noted to be black with a strong hydrocarbon odor. The second sample was collected at 8 ft bgs and appeared clean. Laboratory analysis of these samples found TPH concentrations of 17,000 ppm from the surface sample and 130 ppm from the subsurface sample.	Process knowledge Clark, 1991

Table A.2-1
Conceptual Model for CAU 335, Area 6 Injection Well and Drain Pit
(Page 2 of 4)

Conceptual Model Element	Descriptions/Assumptions	Source
Drain Pit (06-23-03)	This CAS is located in the Well 3 Yard, north of Road 6-06 in Area 6 of the NTS.	Site investigation
	The Drain Pit measures 65 ft x 37 ft and is estimated to be 4-6 ft deep. There is a 17-ft long, shallow ditch that empties into the northwest edge of the pit.	Site investigation
	Two 2.5-in. diameter steel pipes and a 5-in. diameter plastic pipe extrude from the northeastern wall of the pit. The source and use of the plastic pipe are unknown.	Site investigation
	Liquid effluent from truck washing operations in the Well 3 Yard was discharged into the pit over a 30-year period (approximately early 1960s through early 1990s). Two portable steam-cleaners were used to wash the trucks by two different operators.	Process knowledge Bingham, 1992
	Cement Services (Halliburton and B.J. Titan) washed cement pumper trucks on a concrete pad adjacent to and west of the pit. Effluent discharged into the pit via the shallow drainage ditch. Effluent contained fuels (diesel and gasoline), grease, oil, and cement grout.	DOE/NV, 1990
	Geophysical Loggers (Birdwell and Atlas Wireline) washed geophysical logging trucks and geophysical tools at two different locations. Prior to 1985, it is believed that washing occurred at an unidentified outside location east of the pit. Effluent discharged into the pit through a gravity-fed steel drain pipe, believed to be one of the steel drain pipes observed in the pit.	Engineering drawings (H&N, 1981; Stoddard Building Co., date unknown) Sanders, 1995 Hotsy Corporation, 1993
	After 1985, washing occurred at the truck wash bay in the Birdwell Facility, located approximately 175 ft east of the pit. Effluent discharged into the pit through a gravity-fed steel drain pipe, believed to be the other steel drain pipe observed in the pit.	
	Effluent from these two locations contained fuels (diesel and gasoline), grease, oil, a cleaning additive containing solvents and detergents, and possibly radioactive particles.	

Table A.2-1
Conceptual Model for CAU 335, Area 6 Injection Well and Drain Pit
(Page 3 of 4)

Conceptual Model Element	Descriptions/Assumptions	Source
Lateral extent of potential contaminants	Lateral extent of potential contaminants is unknown; however, subsurface effects are limited by relatively low contamination concentrations and low volume and/or low mobility of constituents.	Process knowledge
	COPCs may have been redistributed across the surface of the Well 3 Yard in the vicinity of the Drain Pit and the Cased Hole through regrading, vehicle traffic, or possible remediation activities (i.e., excavation of the Cased Hole). However, lateral contamination is not expected to significantly extend past historical boundaries of each site.	Process knowledge
	The radius of lateral contamination is not expected to extend beyond the borders of the Drain Pit and connected drainage ditch as no overflow of the pit has been identified.	Process knowledge
	The radius of lateral contamination is not expected to exceed more than 10 ft past the presumed location of the center of the Cased Hole.	Process knowledge Site investigation
Vertical extent of potential contaminants	The vertical extent of potential contamination is unknown. Vertical extent will be controlled by surface and subsurface soil geotechnical parameters, driving forces, and volume and mobility of contaminants.	Process knowledge
	The Drain Pit is unlined, creating the potential for vertical migration of contaminants. The vertical extent of contamination is not expected to exceed 10 ft.	Site investigation
	The well casing was sealed at the bottom and it is considered unlikely that waste leaked from the casing and contaminated soil below the bottom of the casing (approximately 7 to 9 ft). However, TPH as waste oil was detected at 130 ppm in a subsurface soil sample collected from 8 ft bgs.	REECo, 1992 Process knowledge Clark, 1991
Depth to groundwater	Groundwater impacts are not expected. The CASs in this CAU are about 1,250 ft southeast of Water Well 3. The depth to groundwater in this well was measured at approximately 1,533 feet below the surface in 1993. Overburden in the well consists of Tertiary alluvium.	IT, 1993
Physical and practical constraints	NTS controlled activities may affect ability to characterize this site. Underground utilities are expected to exist at the Well 3 Yard. Adverse weather conditions and health and safety concerns may affect this site. Certain health hazards may exist as a result of cement outwash in the Drain Pit. The site is relatively remote which may create logistical constraints.	Process knowledge Site investigation

Table A.2-1
Conceptual Model for CAU 335, Area 6 Injection Well and Drain Pit
(Page 4 of 4)

Conceptual Model Element	Descriptions/Assumptions	Source
Future use	Future use for the Area 6 Well 3 Yard is restricted to industrial use.	DOE/NV, 2000
Potential exposures	Oral ingestion, inhalation, or dermal contact (absorption) of COPCs due to inadvertent exposure during sampling activities.	Process knowledge
Waste management	Waste will be considered characteristic unless contrary information is discovered during the investigation.	Process knowledge

A.3.0 Potential Contaminants

Section 3.0 of the CAIP provides additional information on the COPCs for CAU 335, including PALs and QA/QC requirements. Section 5.0 of the CAIP identifies specific laboratory analyses required for the disposal of IDW. The COPCs vary slightly for each CAS included in CAU 335.

A.3.1 CAS 06-20-02, 20-inch Cased Hole

The COPCs at CAS 06-20-02, 20-inch Cased Hole, include VOCs, SVOCs, TPH (diesel-range organics), and total RCRA metals that may have been disposed in the Cased Hole. Any contaminants associated with hydrocarbon spills from CAS 06-20-01, Drums; Oil Waste; Spill will be addressed during investigation of the Cased Hole. Some VOCs, SVOCs, and RCRA metals were detected below PALs in oil and water samples collected from the drums (REECo, 1990). Since these liquids may have contributed to soil contamination at the site, VOCs, SVOCs, and RCRA metals will be considered as COPCs associated with CAS 06-20-02.

Process knowledge and previous sampling data identifies the following COPCs for this CAS:

- Total VOCs, total SVOCs, RCRA metals, TPH (diesel-range organics), based upon:
 - Some VOCs and SVOCs were detected in oil and water samples collected from associated CAS 06-20-01. However, concentrations did not exceed PALs for these constituents.
 - RCRA metals (barium, chromium, and lead) were detected in oil and water samples collected from associated CAS 06-20-01. However, concentrations did not exceed PALs for these constituents.
 - TPH as waste oil was detected at 17,000 mg/kg in a surface soil sample and at 130 mg/kg in a subsurface soil sample collected during excavation of the well casing. These concentrations exceed the PRG level of 100 mg/kg (Clark, 1991).

A.3.2 CAS 06-23-03, Drain Pit

The COPCs at CAS 06-23-03, Drain Pit, include VOCs, SVOCs, TPH (gasoline- and diesel-range organics), ethylene glycol monobutyl ether, PCBs, total RCRA metals, and radionuclides that may have been discharged into the Drain Pit during truck washing activities. Process knowledge identifies the following COPCs for this CAS:

- Total VOCs, total SVOCs, total TPH (gasoline- and diesel-range organics), ethylene glycol monobutyl ether, PCBs, RCRA metals, gamma emitters (Cs-137, Eu-152, Eu-154, Eu-155, Co-60), isotopic Pu, isotopic U, and Sr-90 based upon:
 - Potential VOC, SVOC, TPH, PCBs, and RCRA metals contamination from washing trucks. Fuels, grease, motor oil, and hydraulic fluids are compounds that may have leaked from trucks and discharged into the pit in the effluent stream.
 - Potential chemical contamination from ethylene glycol monobutyl ether, a compound in the cleaning additive "Dayton Heavy Duty Vehicle Cleaner," that was added to the wash stream.
 - Potential radioactive contamination from washing geophysical trucks and downhole geophysical logging tools that were used to log post-test holes. Note: It is assumed that decontamination procedures were followed and the equipment was sufficiently decontaminated prior to washing; therefore, radionuclides in excess of background concentrations are not anticipated.
 - Potential contamination associated with truck maintenance in the Well 3 Yard. Specific operations, housekeeping practices, duration of disposal practices, and materials used are unknown.

The presence of contaminants at this CAU will be evaluated through both field screening and laboratory analyses. Samples submitted for laboratory analysis (as defined in Tables A.3-1 and A.3-2) will be analyzed according to the requirements in Appendix C for the following COPCs:

- Total VOCs
- Total SVOCs
- TPH (gasoline- and diesel-range organics)
- Ethylene glycol monobutyl ether
- PCBs
- Total RCRA metals
- Radionuclides - gamma spectrometry, isotopic Pu, isotopic U, and Sr-90 for samples collected from the Drain Pit. Gamma spectrometry from one sample per boring at the Cased Hole.

Tables A.3-1 and A.3-2 identify the COPCs for each individual CAS.

Table A.3-1
COPCs for CAS 06-20-02, 20-inch Cased Hole

COPCs	Comments	Field-Screening Methods	Field-Screening Levels	Preliminary Action Levels
Total VOCs	Some VOCs detected in oil and water samples collected from associated CAS 06-20-01. However, concentrations were below PALs.	Headspace	20 ppm or 2.5 X background (use greater value)	PRGs ^a NAC 445A ^b
Total SVOCs	Some SVOCs detected in oil and water samples collected from associated CAS 06-20-01. However, concentrations were below PALs.	NA	NA	PRGs ^a NAC 445A ^b
Total RCRA Metals	Barium, chromium, and lead detected in oil and water samples collected from associated CAS 06-20-01. However, concentrations were below PALs.	NA	NA	PRGs ^a NAC 445A ^b
TPH (diesel-range organics)	TPH as waste oil was detected at 17,000 ppm in a surface soil sample and at 130 ppm in a subsurface soil sample collected during excavation of the well casing.	Ultraviolet fluorescence or equivalent	100 ppm	100 ppm NAC 445A ^b

^aEPA Region 9 Preliminary Remediation Goals (PRGs) (EPA, 1999)

^bNevada Administrative Code (NAC, 1999)

NA = Not Applicable

**Table A.3-2
COPCs for CAS 06-23-03, Drain Pit**

COPCs	Comments	Field-Screening Methods	Field-Screening Levels	Preliminary Action Levels
Total VOCs	Possible occurrence. VOCs as possible constituents discharged in effluent.	Headspace	20 ppm or 2.5 X background (use greater value)	PRGs ^a NAC 445 ^b
Total SVOCs	Possible occurrence. SVOCs as possible constituents discharged in effluent.	NA	NA	PRGs ^a NAC 445A ^b
Total PCBs	Possible occurrence. SVOCs as possible constituents discharged in effluent.	NA	NA	PRGs ^a NAC 445A ^b
Ethylene glycol monobutyl ether	Possible occurrence. This compound is a constituent of the cleaning additive "Dayton Heavy Duty Vehicle Cleaner," which was added to the wash stream.	NA	NA	5,000 ppm ^a NAC 445A ^b
Total RCRA Metals	Possible occurrence. Total RCRA metals as possible constituents discharged in effluent.	NA	NA	PRGs ^a NAC 445A ^b
TPH (gasoline- and diesel-range organics)	Possible occurrence. TPH as possible constituents discharged in effluent.	NA	NA	100 ppm NAC 445A ^b
Radionuclides (Cs-137, Eu-152, Eu-154, Eu-155, Co-60, isotopic Pu, isotopic U, Sr-90)	Not expected since process knowledge indicates that geophysical logging equipment was decontaminated to levels below screening levels before washing.	Electra Alpha/Beta scintillator	Mean background activity plus 2 x standard deviations for 20 background sample readings	The PAL is the maximum radionuclide concentration of environmental samples taken from undisturbed background locations.

^aEPA Region 9 Preliminary Remediation Goals (PRGs) (EPA, 1999)

^bNevada Administrative Code (NAC, 2000)

NA = Not Applicable

A.4.0 Decisions and Inputs

A.4.1 Decisions

Decisions to be resolved by the investigation include:

- Determine the presence or absence of COPCs.
- If COPCs are present, determine whether COPC concentrations exceed FSLs.
- If COPCs exceed FSLs, determine whether COPC concentrations exceed PALs.
- If COPCs exceed PALs, determine the nature and extent of contamination with enough certainty to develop and evaluate a range of potential corrective actions, including closure in place and clean closure.

A.4.2 Inputs and Strategy

Inputs are those elements of information used to support the decisions in addressing the identified problem. The strategy provides either the rationale to support the decision or the methodology for collecting data to arrive at the decision. A list of information inputs, existing data, data gaps, and brief strategies are discussed in Table A.4-1.

Table A.4-1
Decisions, Inputs, and General Strategies
(Page 1 of 2)

Decision	Input	Existing Data	Data Gap	Strategy
Are COPCs present above PALs at site?	Potential contaminant identification	Process knowledge of discharge and disposal practices at Cased Hole and Drain Pit. Existing sample data from 1990 and 1991 (CAS 06-20-01, CAS 06-20-02).	Exact COPCs	Collect soil samples and analyze for COPCs.
	Potential contaminant concentration	Existing sample data from 1990 and 1991 (CAS 06-20-01, CAS 06-20-02).	Concentrations of identified COPCs.	Field-screen soil samples. Compare FSRs to FSLs. Perform laboratory analysis of soil samples. Compare results to PALs.
	Potential contaminant distribution	The vertical extent of COPCs is assumed to extend no more than 15 ft bgs at the Cased Hole and 10 ft bgs at the Drain Pit. The lateral extent of COPCs is assumed to be limited to historical boundaries of the Cased Hole and Drain Pit. Cased Hole: Location surmised. Well casing unperforated and sealed at base; potential for vertical contamination unlikely. Assume most or all contaminated surface soil was removed during excavation. Drain Pit: Location known. Assume homogenous spread of effluent within the Drain Pit. Possible concentrations of contaminants in drainage ditch, at low point, and below discharge pipes. No record of effluent overflow.	Vertical and lateral extent of COPCs at Cased Hole and Drain Pit. Exact source of one of the steel drain pipes is unknown. Source and use of plastic pipe is unknown. Contents of pipes are unknown.	Collect soil samples from biased locations to characterize lateral and vertical extent of contamination. Submit soil samples for analysis from surface interval, interval with the highest FSR, and the first two consecutive clean intervals (FSRs < FSLs).
		Drain Pit piping: Source and use of steel drain pipes known or surmised.		Add step-out sampling locations, based on FSRs and laboratory results, to characterize lateral extent of contamination. Collect additional samples from planned locations, based on FSRs, to characterize vertical extent of contamination. Conduct visual, video, and electromagnetic surveys of drain pipes to establish geometry and contents. Collect sediment samples, if present, and analyze for same COPC suite as Drain Pit samples.

Table A.4-1
Decisions, Inputs, and General Strategies
(Page 2 of 2)

Decision	Input	Existing Data	Data Gap	Strategy
Are potential contaminants migrating?	Meteorologic data	The NTS and Yucca Mountain Site Characterization Project data on annual precipitation, evapotranspiration, and weather (Meyers and Nordenson, 1962)	None. Sufficient information available.	No site-specific meteorological data will be collected; general weather conditions are noted on daily field notes.
	Geologic/hydrologic data	Specific geologic/hydrologic characteristics of the site.	Existence and characteristics of differing permeability zones.	Assume mainly near-surface (to 15 ft bgs) investigation. General soil and alluvial characteristics will be noted on sample collection log.
Are data sufficient to support closure options?	No further action	Historical evidence and current site conditions show that the drums of CAS 06-20-01 are no longer present. Any spills associated with this CAS will be investigated under CAS 06-20-02. Historical evidence that contaminants were released to environment at remaining CASS.	NA for CAS 06-20-01 Insufficient evidence from remaining CASS to proceed without investigation. Presence, concentration, and extent of COPCs at remaining CASS.	Include CAS 06-20-01 in the Closure Report for this CAU. Collect field and laboratory samples at remaining CASS and compare results to FSLs and PALs, respectively. If no COPCs are above PALs, prepare CADD/Closure Report.
	Closure in place	Assume industrial soil PRG per NAC 445A (NAC, 2000); assume 100 ppm for TPH per NAC 445A; assume radionuclide concentrations are in the range of background concentrations.	Presence of regulated COPCs. Concentrations above PALs.	Collect field and laboratory samples and compare results to FSLs and PALs, respectively. If no COPCs are above PALs, prepare CADD/Closure Report; otherwise prepare CADD.
	Clean closure by contaminant removal	Assume industrial soil PRG per NAC 445A (NAC, 2000); assume 100 ppm for TPH per NAC 445A; assume radionuclide concentrations are in the range of background concentrations.	Presence, concentration, and extent of COPCs. Volume of contaminated material above PALs.	

A.5.0 Investigation Strategy

Biased surface and subsurface soil sampling will be conducted during the field investigation to determine the presence and the extent of COPCs and whether concentrations exceed PALs for the site. Additional samples may be collected for waste management purposes. Drilling will be the primary investigation technique for this CAU. Visual inspection, video surveys, and electromagnetic surveys will be conducted to investigate the drain pipes associated with CAS 06-23-03, Drain Pit.

Samples will be selected from each boring for laboratory analysis. The sample collected from the surface interval and the sample with the highest FSR will be sent for analysis. In addition, the sample collected from the first of two consecutive "clean" intervals (i.e., FSRs are lower than FSLs) will be submitted for analysis. Field-screening methods and field-screening levels are presented in Tables A.3-1 and A.3-2. Samples will be analyzed for COPCs identified in Section 3.0 of the CAIP in accordance with the requirements in Appendix C.

Environmental soil samples will be field-screened to guide additional drilling or sampling, as appropriate, to guide sample selection for laboratory analysis, to assist in waste management decisions, and to provide health and safety measures. All samples will be field screened for VOCs using a photoionization detector, and radioactivity using an Electra alpha/beta scintillator or equivalent. In addition, samples collected from the Cased Hole will be field screened for TPH using ultraviolet fluorescence or other appropriate methods. Field screening for TPH will be conducted at the Drain Pit, if a test kit using nonhazardous extraction solvents can be identified. This approach will minimize the potential for generating mixed waste at the Drain Pit, which is a possible radioactive site.

A.5.1 CAS 06-20-02, 20-inch Cased Hole

A minimum of four borings will be drilled to investigate the vertical and lateral extent of contamination in the Cased Hole. Additional holes may be drilled at the discretion of the Site Supervisor, based on FSRs.

To investigate the vertical extent of contamination, one boring will be located to penetrate the former location of the Cased Hole. Soil samples will be collected from this boring at the surface and at 5-ft

intervals. These borings will be advanced to a minimum depth of 15 ft bgs and continue until FSRs at two consecutive intervals are below FSLs.

To investigate the lateral extent of contamination, three borings will be located in a triangular pattern around the first boring on approximate 10-ft centers, or at the discretion of the Site Supervisor, based on visual observation and FSRs. Samples will be collected at the surface and at 5-ft intervals. These borings will be advanced to a minimum depth of 15 ft bgs and continue until FSRs at two consecutive intervals are below FSLs.

A.5.2 CAS 06-23-03, Drain Pit

A minimum of nine borings will be drilled inside and around the Drain Pit. The first boring will be located in the low spot in the Drain Pit, based on visual observation. If no low spot is observed, this boring will be located along the southeast wall. A second boring will be centered in the drainage ditch. A third boring will be located under the pair of steel drain pipes and a fourth boring will be located under the plastic pipe.

The remaining five borings will be spaced equidistant along the southern boundary of the Drain Pit, and located approximately 10 ft from the edge of the pit. Additional borings may be drilled at the discretion of the Site Supervisor to adequately characterize the nature and extent of contamination.

Soil samples will be collected from each Drain Pit boring at the surface, at 3 ft bgs, then at each 5-ft interval to total depth. These borings will be advanced until FSRs at two consecutive intervals are below FSLs.

A.5.3 Drain Pipe Investigation

The drain pipes associated with CAS 06-23-03, Drain Pit, will be investigated using a combination of visual inspection, video surveys, EM-31 (or equivalent) surveys, and sediment sampling, if possible.

A.5.3.1 Plastic Pipe

The geometry, extent, and contents of the black plastic pipe will be inspected using visual inspection and a video survey:

- The open end of the pipe protruding from the wall of the drain pit will be visually inspected for the presence of sediment.

- A video survey will be conducted to locate the upstream end of the pipe and to determine the presence or absence of sediment.
- If visual inspection and/or the video survey locate sufficient quantities of sediment, samples will be collected. If results are inconclusive, the pipe will be breached at a nominal midpoint, and an attempt will be made to collect a sediment sample at that location. Any samples collected will be analyzed for the chemical and radiological parameters provided in Section A.3.0.

A.5.3.2 Steel Drain Pipes

The geometry, extent, and contents of the steel drain pipes will be inspected using visual inspection, a video survey, and/or an EM-31 (or equivalent) survey:

- The cement plugs will be cut off the ends of the pipes protruding from the wall of the drain pit. The ends will be visually inspected for the presence of sediment. In addition, the drain in the truck wash bay in the Birdwell Facility will be inspected for the presence of sediment.
- A video survey will be conducted to locate the upstream ends of the pipes and determine the presence or absence of sediment in the steel drain pipe(s).
- An EM-31 survey will be conducted to identify the upstream end(s) of the pipe(s).
- If visual inspection and/or the video survey locate sufficient quantities of sediment, samples will be collected. If the results are inconclusive, the pipe will be breached at a nominal midpoint, and an attempt will be made to collect a sediment sample at that location. Any samples collected will be analyzed for the chemical and radiological parameters provided in Section A.3.0.

A.6.0 Decision Rules

The following decision rules are applicable to this investigation and will be used to guide the investigation and subsequent data evaluation:

- If, in the course of the investigation, either of the following occur, the investigation will be halted and rescoped as necessary:
 - The conceptual model fails to such a degree that rescoping is required.
 - Sufficient data are collected to support evaluation of corrective actions.
- If field screening indicates no COPCs above FSLs at a prescribed sampling location, a soil sample at the next prescribed sampling location will be field screened. If no COPCs are indicated, a confirmatory laboratory sample will be submitted from the upper interval.
- If field screening indicates the presence of COPCs above FSLs, the investigation will continue to determine the vertical and lateral extent of COPCs until FSRs are below FSLs; whereupon, a sample will be submitted for laboratory analysis to verify FSRs. Samples will be submitted for laboratory analysis from the subsurface interval that represents the highest FSR and at the discretion of the Site Supervisor. Additional samples may be required for waste management purposes.
- If laboratory results indicate the presence of contaminants of concern above PALs, a CADD will be prepared.
- If no COPCs are identified above PALs, a CADD/Closure Report will be prepared according to the outline agreed upon by NDEP and DOE/NV. This type of CADD incorporates the elements of the CADD and closure report and serves as the closure report for the site.
- If analytical results are not adequate for preparation of a CADD, additional step-out sampling may be conducted as a Stage II investigation.

Additional Decision Rules for the Drain Pit Drain Pipe Investigation

- If sediment/sludge is identified in the drain pipes in sufficient quantity for sample collection, a sample will be collected and submitted for laboratory analysis. The pipe(s) may be breached, as necessary, at the discretion of the Site Supervisor in an attempt to collect a sufficient quantity of sample material. If necessary, at the discretion of the Site Supervisor, samples from an individual pipe may be composited to obtain a sufficient amount of material for laboratory analysis.

- If no sediment/sludge is identified in the drain pipes in sufficient quantity for sample collection or the investigative techniques prove inconclusive, the pipe(s) will be breached at a nominal midpoint and an attempt will be made to collect a sediment/sludge sample at that point.

A.7.0 Decision Error

Biased sampling will be conducted at CAU 335 as identified in Sections A.4.0, A.5.0, and A.6.0. Biased sampling is appropriate because the CASSs are well defined and process knowledge indicates that contamination, if any, is confined to the historical boundaries of the sites.

The biased sampling strategy targets worst-case contamination by sampling the Cased Hole and Drain Pit at locations with the highest potential for contamination. This sampling strategy will ensure that the extent of the contamination has been adequately located, identified, and quantified. Planned sample intervals may be substituted with intervals that exhibit the highest contamination levels for that sample location based on visual observation or other field-screening techniques. At least one sample with FSRs below FSLs will be obtained from each boring to define the lower limit of soil contamination (if any). FSRs will be confirmed by off-site laboratory analysis for these samples.

All soil samples will be field screened for VOCs and radionuclides. In addition, soil samples collected from the Cased Hole will be field screened for TPH. Field screening for TPH will be conducted at the Drain Pit, if a test kit using nonhazardous extraction solvents can be identified. This approach will minimize the potential for generating mixed waste at the Drain Pit, which is a possible radioactive site. Selected samples from each boring, as described in Sections A.5.1, A.5.2, and A.5.3, will be sent for off-site laboratory analysis for the appropriate COPCs listed in Tables A.3-1 and A.3-2.

A.8.0 References

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APPENDIX B

USE RESTRICTION DOCUMENTATION

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CAU Use Restriction Information

CAU Number/Description: CAU 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada

Applicable CAS Numbers/Descriptions: CAS 06-20-02, 20-inch Cased Hole

Contact (organization/project): NNSA/NSO Industrial Sites Project Manager

Surveyed Area (UTM coordinates, Zone 11, NAD 27):

CAS 06-20-02, 20-inch Cased Hole (South side of Road 6-06)

NW corner:	4,094,494.92 m N	584,086.83 m E
NW1 turning:	4,094,378.37 m N	584,080.87 m E
NW2 turning:	4,094,381.40 m N	584,050.58 m E
SW corner:	4,094,342.54 m N	584,048.29 m E
SE corner:	4,094,344.99 m N	584,406.03 m E
NE corner:	4,094,491.00 m N	584,287.95 m E

CAS 06-20-02, 20-inch Cased Hole (North side of Road 6-06)

NW corner:	4,094,521.20 m N	584,163.99 m E
SW corner:	4,094,506.78 m N	584,163.14 m E
SE corner:	4,094,503.52 m N	584,282.53 m E
NE corner:	4,094,516.83 m N	584,282.39 m E

Survey Date 06/16/2003 **Survey Method** GPS

Site Monitoring Requirements: Post-closure monitoring consists of annual visual inspections of the signs to verify that they are in place and readable, and that use restrictions are maintained.

Monitoring Frequency (quarterly, annually?): Annually

If Monitoring Has Started, Indicate Last Completion Date: N/A

Use Restrictions

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 335 Closure Report (Document number DOE/NV--910, 2003) for additional information on the site condition and any inspection requirements.

Submitted By: Sabin Cook

Date: 6/25/03

Attachments: Use Restriction Map.

CAU Use Restriction Information

CAU Number/Description: CAU 335: Area 6 Injection Well and Drain Pit, Nevada Test Site, Nevada

Applicable CAS Numbers/Descriptions: CAS 06-23-03, Drain Pit

Contact (organization/project): NNSA/NSO Industrial Sites Project Manager

Surveyed Area (UTM coordinates, Zone 11, NAD 27):

CAS 06-23-03, Drain Pit

NW corner:	4,094,575.79 m N	584,186.59 m E
NE corner:	4,094,573.41 m N	584,282.39 m E
SE corner:	4,094,531.27 m N	584,282.39 m E
SW corner:	4,094,530.31 m N	584,187.04 m E

Survey Date 05/27/2003

Survey Method GPS

Site Monitoring Requirements: Post-closure monitoring consists of annual visual inspections of the signs to verify that they are in place and readable, and that use restrictions are maintained.

Monitoring Frequency (quarterly, annually?): Annually

If Monitoring Has Started, Indicate Last Completion Date: N/A

Use Restrictions

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 335 Closure Report (Document number DOE/NV--910, 2003) for additional information on the condition of the site and any monitoring and/or inspection requirements.

Submitted By: Libbie Carter

Date: 6/25/03

Attachments: Use Restriction Map.

Nevada Test Site Area 6 Well 3 Yard

EXPLANATION

- Surveyed corner locations for use restrictions
- + Use Restriction Posting Locations
- CAS Use Restriction Boundary

All Coordinates given as
 Universal Transverse Mercator
 Zone 11
 North American Datum 1927
 meters

FIGURE NOT TO SCALE

USE RESTRICTION BOUNDARIES FOR
 CAU 335: AREA 6 INJECTION WELL AND DRAIN PIT
 CAS 06-20-02, 20-INCH CASED HOLE AND
 CAS 06-23-03, DRAIN PIT

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APPENDIX C

PHOTOGRAPHS OF CLOSURE ACTIVITIES

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PHOTOGRAPH LOG

PHOTOGRAPH NUMBER	DATE	DESCRIPTION
1	06/03/2002	Grouted pipes in Corrective Action Site (CAS) 06-23-03, Drain Pit.
2	06/03/2003	Grouted pipes in CAS 06-23-03, Drain Pit.
3	06/04/2003	Backfilling CAS 06-23-03, Drain Pit.
4	06/04/2003	Backfilling CAS 06-23-03, Drain Pit.
5	06/04/2003	Backfilling CAS 06-23-03, Drain Pit.
6	06/04/2003	Final backfilled, graded CAS 06-23-03, Drain Pit.
7	06/04/2003	Placing Use Restriction warning signs.
8	06/04/2003	Placing Use Restriction warning signs

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APPENDIX D

SAMPLE ANALYTICAL RESULTS*

* As stated in Section 1.3 of this CR, Sample Analytical Results are not applicable to the closure of CAU 335. No confirmation samples were required for the closure of CAU 335.

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APPENDIX E

CLOSURE CERTIFICATION*

* As stated in Section 1.3 of this CR, a Closure Certification is not applicable to the closure of CAU 335. No Closure Certification is required or necessary for closure of CAU 335.

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APPENDIX F

AS-BUILT DOCUMENTATION*

* As stated in Section 1.3 of this CR, As-Built Documentation is not applicable to the closure of CAU 335. No engineered structures were constructed during the closure of CAU 335.

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APPENDIX G

MODIFICATION TO THE POST-CLOSURE PLAN*

* As stated in Section 1.3 of this CR, Modifications to the Post-Closure Plan are not applicable to the closure of CAU 335.

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APPENDIX H

NEVADA ENVIRONMENTAL RESTORATION PROJECT DOCUMENT REVIEW SHEET

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NEVADA ENVIRONMENTAL RESTORATION PROJECT DOCUMENT REVIEW SHEET

[illegible]

^aComment Types: M = Mandatory, S = Suggested.

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