UNCONTROLLED

FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (FFACO)
RECORD OF TECHNICAL CHANGE (ROTC)

Corrective Action Unit (CAU) Number: 204
CAU Description: Storage Bunkers
CAU Owner: Industrial Sites - Environmental Restoration (ER)

ROTC No. DOE/NV--1117-ROTC 4 **Page** 1 of 3

Document Type Closure Report (CR) **Date** 10/12/2022

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

Tiffany Gamero
Requestor Name

Long-Term Monitoring Activity Lead
Requestor Title

Description of Change:

1. This ROTC replaces the Use Restriction figure for CAS 02-34-01 in Appendix D.

Justification:

1. The original Use Restriction figure is for CAS 01-34-01. The attached replacement figure is for CAS 02-34-01.

Schedule Impacts:

No impacts to schedule.

ROTC applies to the following document(s):

- U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2006. Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada, Rev. 0, DOE/NV--1117. Las Vegas, NV.

FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (FFACO)
RECORD OF TECHNICAL CHANGE (ROTC)

Corrective Action Unit (CAU) Number: 204
CAU Description: Storage Bunkers
CAU Owner: Industrial Sites - Environmental Restoration (ER)

ROTC No. DOE/NV--1117-ROTC 4 **Page** 2 of 3

Document Type Closure Report (CR) **Date** 10/12/2022

Approvals:

Tiffany A. Gamero Digitally signed by Tiffany A. Gamero Date: 2022.10.17 08:29:37 -07'00' Date _____

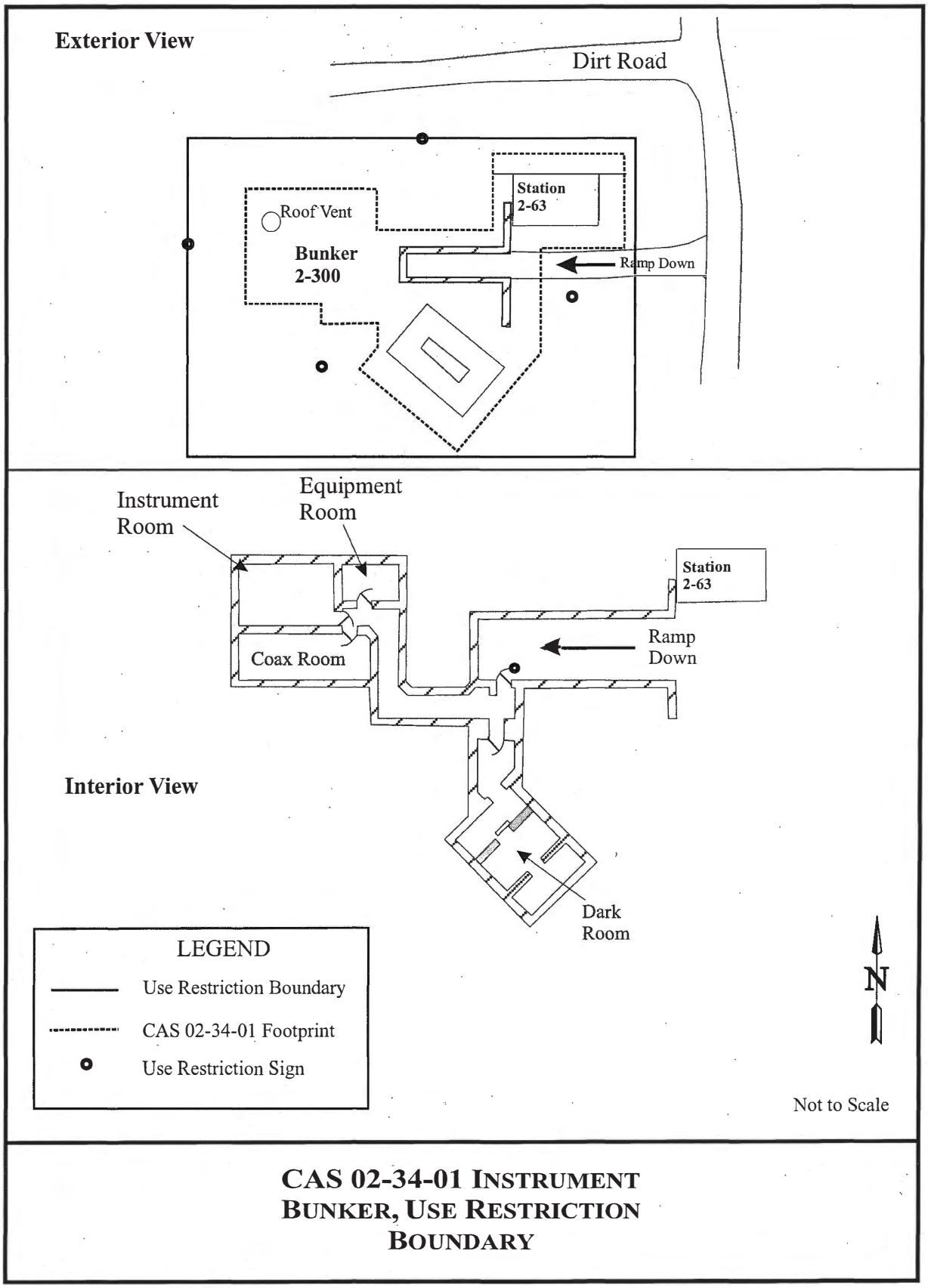
Tiffany Gamero
Activity Lead
Environmental Management (EM) Nevada Program

WILHELM WILBORN Digitally signed by WILHELM WILBORN Date: 2022.10.17 13:19:06 -07'00' Date _____

Bill Wilborn
Deputy Program Manager, Operations
Environmental Management (EM) Nevada Program

Christine Andres Digitally signed by Christine Andres Date: 2022.10.21 12:48:46 -07'00' Date _____

Christine Andres
Chief, Bureau of Federal Facilities
Nevada Division of Environmental Protection (NDEP)



CAS 02-34-01 INSTRUMENT BUNKER, USE RESTRICTION BOUNDARY

FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (FFACO)
RECORD OF TECHNICAL CHANGE (ROTC)

Corrective Action Unit (CAU) Number: 204
CAU Description: Storage Bunkers
CAU Owner: Industrial Sites - Environmental Restoration (ER)

ROTC No. DOE/NV--1117-ROTC 3 **Page** 1 of 15

Document Type Closure Report (CR) **Date** 10/12/2022

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

Tiffany Gamero
Requestor Name

Long-Term Monitoring Activity Lead
Requestor Title

Description of Change:	Justification:
1. This ROTC replaces the Use Restriction (UR) information listed in the documentation for CAU 204. UR forms have been updated to list all UR requirements, including but not limited to: post-closure site controls (signs, fencing, etc.), inspection and maintenance requirements, and Geographic Information Systems (GIS) coordinate information. The UR requirements and form(s) included in this ROTC represent the current corrective action requirements for each Corrective Action Site (CAS) in this CAU and supersede information concerning corrective action and post-closure requirements in existing documentation.	1. Some changes in the UR requirements from those found in closure documents have been subsequently modified in letters, memos, and inspection reports. This has resulted in difficulty in determining current post-closure requirements. A review of the post-closure requirements for this CAU has been conducted to ensure that all requirements have been identified and documented on the new UR form. The new UR form was developed to be inclusive of all requirements for long-term monitoring and standardize information contained in the URs consistent with current protocols.
2. Remove URs for CASs 01-34-01, 02-34-01, and 03-34-01.	2. Based on an evaluation that concentrations of contaminants at these CASs do not exceed final action levels or industrial action levels, it is recommended that the UR be removed from this CAS. There is no potential for contaminants to result in soil contaminants that would justify

FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (FFACO)
RECORD OF TECHNICAL CHANGE (ROTC)

Corrective Action Unit (CAU) Number: 204
CAU Description: Storage Bunkers
CAU Owner: Industrial Sites - Environmental Restoration (ER)

ROTC No. DOE/NV--1117-ROTC 3 **Page** 2 of 15

Document Type Closure Report (CR) **Date** 10/12/2022

Description of Change:	**Justification:**
	use restrictions at these CASs.
3. Removed contaminant information from the UR for CAS 05-18-02 and CAS 05-33-01.	3. The contaminant information does not constitute requirements for the UR. Contaminant information is captured voluntarily by DOE as BMPs along with other useful information and documented in the Supplemental Information section of the FFACO database UR module.
4. Removed description of permissible activities for CAS 05-18-02 and CAS 05-33-01.	4. This is not needed as Administrative URs are only implemented where contamination is below levels that require corrective action controls.

Schedule Impacts:
No impacts to schedule.

ROTC applies to the following document(s):

- U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2006. Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada, Rev. 0, DOE/NV--1117. Las Vegas, NV.
- ROTC 1 for CAU 204 CR (DOE/NV--1117), dated 12/11/2013.
- ROTC 2 for CAU 204 CR (DOE/NV--1117), dated 12/11/2013.

FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (FFACO)
RECORD OF TECHNICAL CHANGE (ROTC)

Corrective Action Unit (CAU) Number: 204
CAU Description: Storage Bunkers
CAU Owner: Industrial Sites - Environmental Restoration (ER)

ROTC No. DOE/NV--1117-ROTC 3 **Page** 3 of 15

Document Type Closure Report (CR) **Date** 10/12/2022

Approvals:

Tiffany A. Gamero Digitally signed by Tiffany A. Gamero Date: 2022.10.12 07:18:23 -07'00' Date _____

Tiffany Gamero
Activity Lead
Environmental Management (EM) Nevada Program

WILHELM WILBORN Digitally signed by WILHELM WILBORN Date: 2022.10.17 13:20:10 -07'00' Date _____

Bill Wilborn
Deputy Program Manager, Operations
Environmental Management (EM) Nevada Program

Christine Andres Digitally signed by Christine Andres Date: 2022.10.21 12:37:24 -07'00' Date _____

Christine Andres
Chief, Bureau of Federal Facilities
Nevada Division of Environmental Protection (NDEP)

U.S. Department of Energy, Environmental Management Nevada Program
Use Restriction Information

General Information

Use Restriction (UR) Type(s):	Administrative Only
Corrective Action Unit (CAU) Number & Description:	204 - Storage Bunkers
Corrective Action Site (CAS) Number & Description:	05-18-02 - Chemical Explosives Storage
CAU/CAS Owner:	Industrial Sites - ER
Note:	N/A

Section I. *Federal Facility Agreement and Consent Order* (FFACO) UR

An FFACO UR is not identified for this site.

Section II. Administrative UR

Basis for Administrative UR

Summary Statement: This Administrative UR is established to protect workers should future land use result in increased exposure to depleted uranium at this site. Radiological contaminants are present that are assumed to exceed action levels under the Industrial Area (2,000 hours) exposure scenario.

U.S. Department of Energy, Environmental Management Nevada Program
Use Restriction Information

Administrative UR Physical Description

Surveyed Area (UTM, Zone 11, NAD 83, meters):

UR Boundary	UR Point[1]	Easting[2]	Northing[2]
Admin Boundary	1	592,692	4,077,488
	2	592,649	4,077,502
	3	592,684	4,077,624
	4	592,721	4,077,613
	5	592,713	4,077,584
	6	592,721	4,077,582
	7	592,692	4,077,488

[1]UR Points are listed clockwise beginning at the southernmost point. If multiple points share the southernmost Northing coordinate, the easternmost point is listed as Point 1.

[2]UR Coordinate values presented herein were captured in North American Datum of 1983, and rounded to the nearest meter when necessary; due to that rounding, coordinates may not reflect the original precision of values contained within the source GIS data set.

Boundary Applies to: Both Surface and Subsurface

Starting Depth: 0 **Ending Depth:** 2

Depth Unit: Meters

Survey Source: GPS

Administrative UR Requirements

Administrative URs do not require onsite postings or other physical barriers, and they do not require periodic inspections or maintenance.

Site Controls:

This Administrative UR is recorded as described in **Section IV. Recordation Requirements** to restrict activities within the area defined by the coordinates listed above and depicted in the attached figure without prior notification of NDEP unless the activities are conducted under the provisions of 10 CFR, Part 835, Occupational Radiation Protection and 10 CFR, Part 851, Worker Safety and Health Program.

U.S. Department of Energy, Environmental Management Nevada Program
Use Restriction Information

Section III. Supporting Documentation

UR Source Document(s)

ROTC 3 for CAU 204 CR (DOE/NV--1117), dated 05/11/2022.

ROTC 1 for CAU 204 CR (DOE/NV--1117), dated 12/11/2013.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2006. Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada, Rev. 0, DOE/NV--1117. Las Vegas, NV.

Attachments

- Administrative UR Boundary Map (UTM, Zone 11, NAD 83 meters)
- Supplemental Information Figure (UTM, Zone 11, NAD 83 meters)

Section IV. Recordation Requirements

Recordation:

The above UR(s) are recorded in the:

- FFACO Database
- NNSA M&O Contractor GIS
- EM Nevada Program CAU/CAS Files

Section V. EM Nevada Program Approval

Tiffany A. Gamero

Digitally signed by Tiffany A. Gamero
Date: 2022.10.12 07:19:47 -07'00'

Date: _____

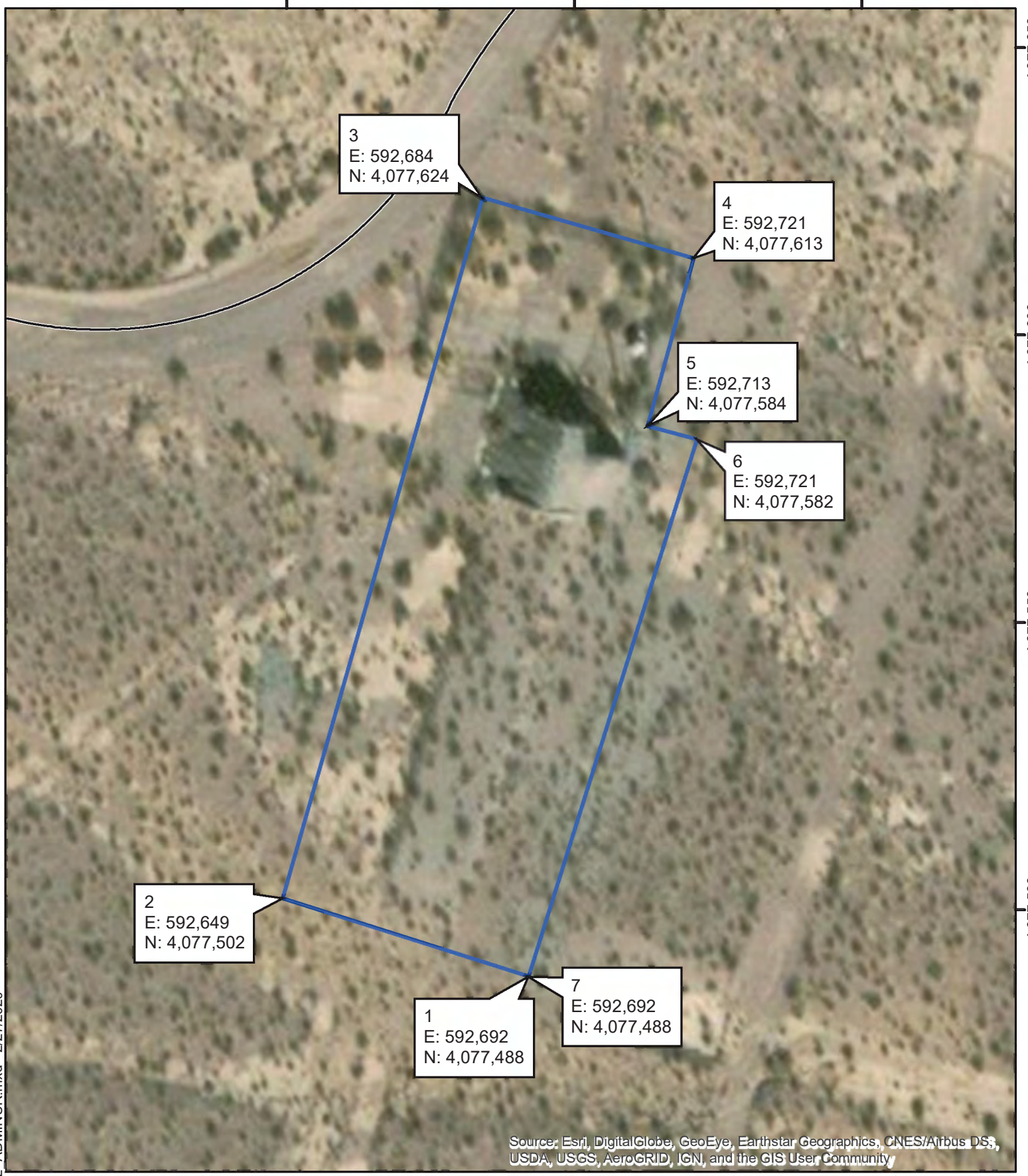
Tiffany Gamero

Activity Lead

EM Nevada Program

UR is effective upon acceptance by NDEP.

UNCONTROLLED



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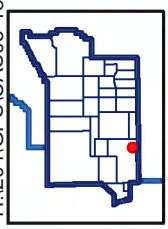


CAU 204, CAS 05-18-02
Chemical Explosives Storage
Administrative UR Boundary

Explanation

- Administrative UR
- Light Duty Road

0 10 20 40 Meters

0 30 60 120 Feet

N

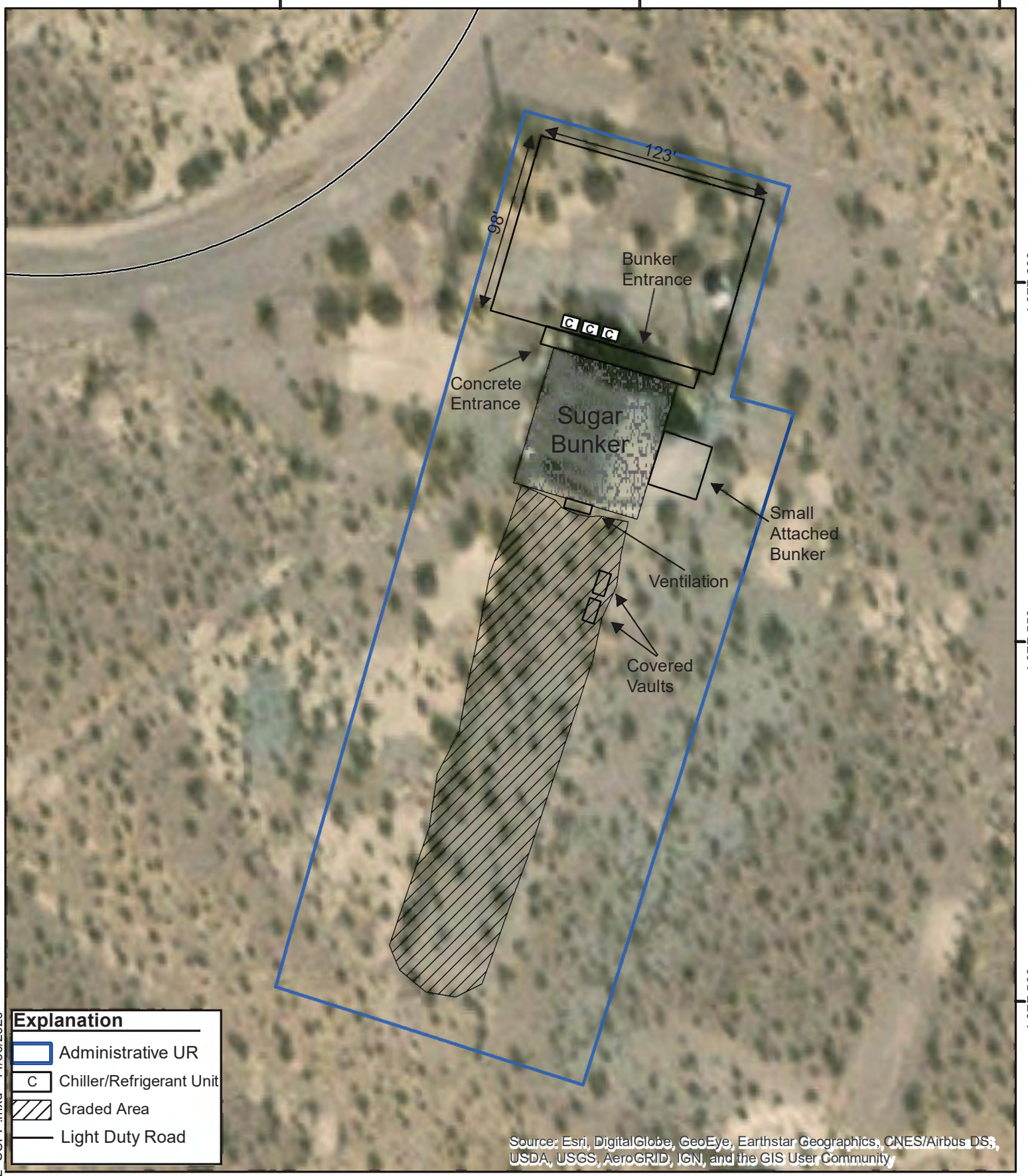
Source: Navarro GIS, 2020

Coordinate System: NAD 1983 UTM Zone 11N, Meter

Supplemental Information Figure

The attached supplemental information figure(s) are included to capture site feature information that was available in previous iterations of this Use Restriction (UR) to prevent loss of that information.

UNCONTROLLED



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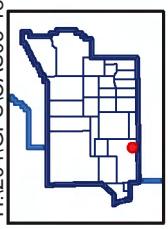


Source: Navarro GIS, 2020

CAU 204, CAS 05-18-02
Chemical Explosives Storage
Supplemental Information
General Location of Site Features

0 5 10 20 Meters

0 30 60 120 Feet

N

NOTE: Size and location of features are approximated.
Coordinate System: NAD 1983 UTM Zone 11N, Meter

U.S. Department of Energy, Environmental Management Nevada Program
Use Restriction Information

General Information

Use Restriction (UR) Type(s):	Administrative Only
Corrective Action Unit (CAU) Number & Description:	204 - Storage Bunkers
Corrective Action Site (CAS) Number & Description:	05-33-01 - Kay Blockhouse
CAU/CAS Owner:	Industrial Sites - ER
Note:	N/A

Section I. *Federal Facility Agreement and Consent Order* (FFACO) UR

An FFACO UR is not identified for this site.

Section II. Administrative UR

Basis for Administrative UR

Summary Statement: This Administrative UR is established to protect workers should future land use result in increased exposure to site contaminants. Chemical contaminants are present that exceed action levels under the Industrial Area (2,000 hours) exposure scenario.

U.S. Department of Energy, Environmental Management Nevada Program
Use Restriction Information

Administrative UR Physical Description

Surveyed Area (UTM, Zone 11, NAD 83, meters):

UR Boundary	UR Point[1]	Easting[2]	Northing[2]
Admin Boundary	1	592,297	4,076,002
	2	592,254	4,076,003
	3	592,212	4,076,023
	4	592,212	4,076,122
	5	592,249	4,076,146
	6	592,306	4,076,102
	7	592,315	4,076,033
	8	592,297	4,076,002

[1]UR Points are listed clockwise beginning at the southernmost point. If multiple points share the southernmost Northing coordinate, the easternmost point is listed as Point 1.

[2]UR Coordinate values presented herein were captured in North American Datum of 1983, and rounded to the nearest meter when necessary; due to that rounding, coordinates may not reflect the original precision of values contained within the source GIS data set.

Boundary Applies to: Both Surface and Subsurface

Starting Depth: 0 **Ending Depth:** 6

Depth Unit: Meters

Survey Source: GPS

Administrative UR Requirements

Administrative URs do not require onsite postings or other physical barriers, and they do not require periodic inspections or maintenance.

Site Controls:

This Administrative UR is recorded as described in **Section IV. Recordation Requirements** to restrict activities within the area defined by the coordinates listed above and depicted in the attached figure without prior notification of NDEP unless the activities are conducted under the provisions of 10 CFR, Part 835, Occupational Radiation Protection and 10 CFR, Part 851, Worker Safety and Health Program.

U.S. Department of Energy, Environmental Management Nevada Program
Use Restriction Information

Section III. Supporting Documentation

UR Source Document(s)

ROTC 3 for CAU 204 CR (DOE/NV--1117), dated 05/11/2022.

ROTC 2 for CAU 204 CR (DOE/NV--1117), dated 12/11/2013.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2006. Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada, Rev. 0, DOE/NV--1117. Las Vegas, NV.

Attachments

- Administrative UR Boundary Map (UTM, Zone 11, NAD 83 meters)
- Supplemental Information Figure (UTM, Zone 11, NAD 83 meters)

Section IV. Recordation Requirements

Recordation:

The above UR(s) are recorded in the:

- FFACO Database
- NNSA M&O Contractor GIS
- EM Nevada Program CAU/CAS Files

Section V. EM Nevada Program Approval

Tiffany A. Gamero

Digitally signed by Tiffany A. Gamero
Date: 2022.10.12 07:21:55 -07'00'

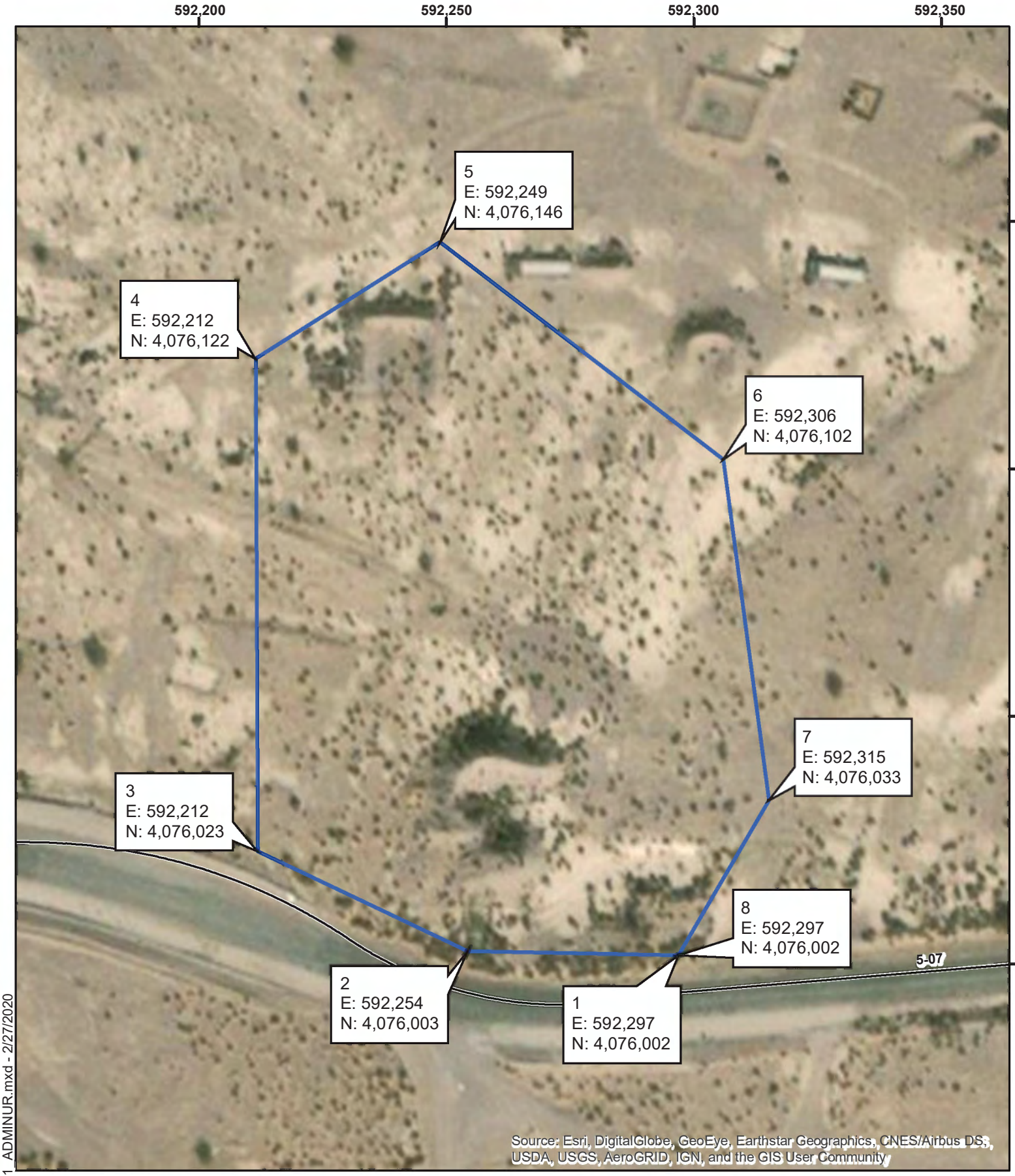
Date: _____

Tiffany Gamero

Activity Lead

EM Nevada Program

UR is effective upon acceptance by NDEP.



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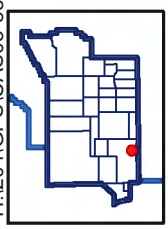

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CAU 204, CAS 05-33-01
Kay Blockhouse
Administrative UR Boundary

Explanation

- Administrative UR
- Light Duty Road

0 10 20 40 Meters

0 30 60 120 Feet

N

Source: Navarro GIS, 2020

Coordinate System: NAD 1983 UTM Zone 11N, Meter

Supplemental Information Figure

The attached supplemental information figure(s) are included to capture site feature information that was available in previous iterations of this Use Restriction (UR) to prevent loss of that information.

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UNCONTROLLED

CAU 204, CAS 05-33-01
Kay Blockhouse
Supplemental Information
General Location of Site Features

0 12.5 25 50 Meters

0 50 100 200 Feet

N

NOTE: Size and location of features are approximated.

Coordinate System: NAD 1983 UTM Zone 11N, Meter

Source: Navarro GIS, 2020

RECORD OF TECHNICAL CHANGE

Technical Change No. DOE/NV—1117 ROTC-2 Page 1 of 1

Activity Name Industrial Sites Date 12/11/2013

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

Cathleen Birney (Name) N-I CAU Lead (Title)

Description of Change:
Downgrade the FFACO UR at CAU 204, CAS 05-33-01, Kay Blockhouse to an Administrative UR.

Justification:
Since this FFACO UR was established, practices and procedures relating to the implementation of risk-based corrective actions (RBCA) have changed. Therefore, this UR was re-evaluated against the current RBCA criteria as defined in the *Soils Risk-Based Corrective Action Evaluation Process*. This re-evaluation consisted of 1) assuming that the future land use for this CAS is Occasional Use (OU), 2) calculating the present-day activities of the original data used to define the need for the UR, and 3) using the current risk-based OU residual radioactive material guidelines (RRMGs) to calculate the total effective dose (TED). The risk-based RRMGs were developed using the current Soils RBCA process and the most current RRMGs for the OU exposure scenario. The TED is below the 25-millirem per OU year constraints. Also, the present-day radiological activities of U-238 are below the Industrial Area PAL and may be removed from the UR.

Additionally, the FALs for lead and RDX (explosives) were revised using the OU exposure scenario using the EPA Region 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites Calculator and the latest input values. The chemical results are below the revised OU FALs. Therefore, the FFACO UR is being downgraded to an Administrative UR. See attached "Recommendation to Downgrade Use Restriction" for detailed information.

The task time will be Unchanged by approximately 0 days.

Applicable Activity-Specific Document(s):
Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada

Approved By:

/s/ Tiffany A. Lantow Date 12/11/2013
Activity Lead

/s/ Robert F. Boehlecke Date 12/12/13
EM Operations Manager

/s/ Jeff MacDougall Date 12/17/13
NDEP

Nevada
Environmental
Management
Operations Activity

DOE/NV--1509-Rev.1

National Nuclear Security Administration

Recommendations and Justifications for Modifications To Downgrade Use Restrictions Established under the U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office *Federal Facility Agreement and Consent Order*

Controlled Copy No.: UNCONTROLLED
Revision No.: 1

October 2013

/s/ Joseph P. Johnston, N-I CO 10/08/2013

Approved for public release; further dissemination unlimited.

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

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Email: *reports@adonis.osti.gov*

DOE/NV--1509-Rev.1

RECOMMENDATIONS AND JUSTIFICATIONS FOR MODIFICATIONS TO DOWNGRADE USE RESTRICTIONS ESTABLISHED UNDER THE U.S. DEPARTMENT OF ENERGY, NATIONAL NUCLEAR SECURITY ADMINISTRATION NEVADA FIELD OFFICE *FEDERAL FACILITY AGREEMENT AND CONSENT ORDER*

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

Controlled Copy No.: UNCONTROLLED

Revision No.: 1

October 2013

Approved for public release; further dissemination unlimited.

RECOMMENDATIONS AND JUSTIFICATIONS
FOR MODIFICATIONS TO DOWNGRADE USE RESTRICTIONS ESTABLISHED
UNDER THE U.S. DEPARTMENT OF ENERGY,
NATIONAL NUCLEAR SECURITY ADMINISTRATION NEVADA FIELD OFFICE
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER

Approved by: /s/ Tiffany A. Lantow Date: 10/9/2013
Tiffany A. Lantow
Industrial Sites Activity Lead

Approved by: /s/ Robert F. Boehlecke Date: 10/9/2013
Robert F. Boehlecke
Environmental Management Operations Manager

6.0 CAU 204, CAS 05-33-01 – Kay Blockhouse

6.1 CAS Description

CAS 05-33-01, Kay Blockhouse, consists of an area of approximately 11 acres and includes the Kay Blockhouse, two burn pits with steel frames, one burn pit with a soil berm, two open pits, two steel-lined subsurface pits, one berm with embedded piping, one berm with piping debris, a burn area with a large concrete block with an embedded steel prong, and one open pit with a concrete foundation at the north end. The Kay Blockhouse was constructed in 1951 and was used as an instrumentation bunker for Operation Ranger, a series of five atmospheric nuclear tests. The burn pits and other surface features within the CAS boundary were not part of the nuclear testing. The Kay Blockhouse is constructed of concrete with a wooden entryway door. The details of the construction of the floor are unknown (NNSA/NSO, 2004b).

During closure activities, lead- and radiologically impacted soil was removed, and verification samples were collected. Friable asbestos material was removed from the burn pits; the asbestos and steel frames from the burn pits were disposed of at the Area 23 Sanitary Landfill. In addition, the two steel-lined pits were filled with native soil and capped with 1.5 ft of concrete. The bunker was secured by installing security fencing and a gate around the entrance to the bunker. The RMA was reestablished and fenced with T-post and wire-rope fencing (NNSA/NSO, 2006a).

6.2 Current UR Description

The future use of any land related to this CAU is restricted from any DOE or USAF activity that may alter or modify the containment control as approved by the State of Nevada and identified in the CAU CR or other CAU documentation unless appropriate concurrence is obtained in advance. Eleven UR warning signs were posted along the fence. Site monitoring requirements for the FFACO UR include annual visual inspections of UR signs and fencing, and maintenance as needed (NNSA/NSO, 2006a).

6.3 Basis for Current UR

Site characterization samples were collected for VOCs, SVOCs, RCRA metals, beryllium, TPH-DRO and TPH-GRO, PCBs, gamma spectroscopy, isotopic Pu, isotopic U, Sr-90, and explosives. The

radionuclides actinium (Ac)-228, bismuth (Bi)-212, lead (Pb)-212, thallium (Tl)-208, Th-234, and U-238 exceeded the PALs; lead and RDX also exceeded the PALs. Asbestos-containing material was discovered in the steel-lined burn pits, the steel-framed burn pit, and the burn pit with soil berm, at concentrations ranging from 1 to 20 percent asbestos. Table 6-1 contains analytical results of all COCs at CAS 05-33-01 that are the basis for the current URs. The sample matrix for all samples is soil.

The PALs for radiological contaminants were established in the ROTC to the CAIP (NNSA/NSO, 2004f) and were based on the NCRP Report No. 129 recommended screening limits for construction, commercial, and industrial land use scenarios (NCRP, 1999) scaled from 25- to 15-mrem/yr dose and the generic guidelines for residual concentration of radionuclides in DOE Order 5400.5 (DOE, 1993).

6.4 Basis for UR Modification

The revised FAL for RDX was calculated using the OU exposure scenario. The FAL for RDX was revised using the EPA Region 9 RSLs for Chemical Contaminants at Superfund Sites Calculator (EPA, 2013b) and the latest input values (NNSA/NFO, 2013c). The OU scenario assumes occasional work activities at the site, and that a worker will be on the site for an equivalent of 80 hr/yr (or 10 days) for 5 years. (NNSA/NSO, 2012b).

Only the IA or RW exposure scenarios are used to calculate a Tier 2 action level for lead (NNSA/NFO, 2013c) using the EPA Adult Lead Methodology calculator (EPA, 2003). The RW FAL will be used for lead. The RW scenario assumes non-continuous work activities at a site and that a worker will be exposed to the site contaminants for up to 336 hr/yr (or 42 days) (NNSA/NSO, 2012b).

The present-day radiological activities were calculated using the standard decay equation; the decay calculations take into account the half-life of the radionuclide and the time since the samples were originally collected. The OU RRMGs are based on the 25-mrem/yr TED constraint, which represents the concentrations in soil for a specific radionuclide that would result in a 25-mrem/yr TED to a receptor for a specific exposure time.

Table 6-1
Sample Results for COCs at CAS 05-33-01 Used To Establish Current UR

Sample ID	Depth (ft bgs)	Lead	RDX	Ac-228	Bi-212	Pb-212	Tl-208	Th-234	U-238
		PAL 750 mg/kg	PAL 16 mg/kg	PAL 5 pCi/g	PAL 5 pCi/g	PAL 5 pCi/g	PAL 5 pCi/g	PAL 63.2 pCi/g	PAL 63.2 pCi/g
204E034	0.0 - 0.5	2,300	--	--	--	--	--	--	--
204E036	0.0 - 0.5	1,300	170	29.1 ± 5.2	27.1 ± 8.2	31.1 ± 5.3	8.3 ± 1.6	--	--
204E037	0.0 - 0.5	1,200	--	--	--	--	--	--	--
204E040	0.0 - 0.5	--	--	--	--	--	--	--	65.6 ± 9.2
204E050	0.0 - 0.5	--	--	--	--	--	--	--	72.5 ± 9.6
204E189	0.0 - 0.5	--	--	--	--	--	--	66.6 ± 8.7	64 ±11 (Y2, M3)
204E190	0.0 - 0.5	--	--	--	--	--	--	67.4 ± 8.4	--
204E212	0.0 - 0.5	--	--	--	--	--	--	--	77 ± 14 (Y2)
204E220	0.0 - 0.5	--	--	--	--	--	--	95 ± 12	87 ± 14 (M3)

MDC = Minimum detectable concentration

M3 = The requested MDC was not met, but the reported activity is greater than the reported MDC.
Y2 = Chemical yield outside default limits.
-- = No detects above action levels.

Because the half-lives of Bi-212, Tl-208, Pb-212, and Th-234 are so short and these radionuclides decay rapidly, the present-day radiological activities for the radionuclides are effectively 0 pCi/g. The radionuclides Th-234 and U-238 are reflective of the same contaminants; therefore, only U-238 had the present-day activities calculated.

The present-day radiological activities, OU RRMGs, and the TED for the U-238 are listed in Table 6-2, which demonstrates that the TED of U-238 is below the 25-mrem/yr TED constraint for the OU exposure scenario. The lead and RDX results and their revised FALs are also listed in Table 6-2, which demonstrates that the lead and RDX results are below their respective FALs.

Table 6-2
Revised FALs, Present-Day Radiological Activities, OU RRMGs, and TED for COCs at CAS 05-33-01

Sample ID	Depth (ft bgs)	Lead	RDX	U-238	TED (mrem/OU-yr)
		RW FAL 8,356 mg/kg	OU FAL 2,960 mg/kg	OU RRMG 31,190 pCi/g	
204E034	0.0 - 0.5	2,300	--	--	N/A
204E036	0.0 - 0.5	1,300	170	--	N/A
204E037	0.0 - 0.5	1,200	--	--	N/A
204E040	0.0 - 0.5	--	--	65.6	0.05
204E050	0.0 - 0.5	--	--	72.5	0.06
204E189	0.0 - 0.5	--	--	64	0.05
204E212	0.0 - 0.5	--	--	77	0.06
204E220	0.0 - 0.5	--	--	87	0.07

N/A = Not applicable

-- = No detects above action levels.

6.5 *Proposed Modification*

Remove the FFACO UR and postings from this site; discontinue annual inspections; and change to an Administrative UR for lead and RDX. Because the present-day U-238 activity is below the IA PAL of 1,581 pCi/g, the radionuclides (U-238) may be removed from this UR. These modifications will not affect or modify any non-FFACO requirements at this site.

References

DOE, see U.S. Department of Energy.

EPA, see U.S. Environmental Protection Agency.

NCRP, see National Council on Radiation Protection and Measurements.

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

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

National Council on Radiation Protection and Measurements. 1999. *Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies,* NCRP Report No. 129. Bethesda, MD.

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U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004b. *Corrective Action Decision Document for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada,* Rev. 0, DOE/NV--959. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004f. *Record of Technical Change to Corrective Action Investigation Plan for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada,* Rev. 0, DOE/NV--866-RTC1. Technical Change No. 1, 10 March. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2006a. *Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada,* Rev. 0, DOE/NV--1117. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2012b. *Soils Risk-Based Corrective Action Evaluation Process*, Rev. 0, DOE/NV--1475. Las Vegas, NV.

U.S. Environmental Protection Agency. 2003. *Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil,* EPA-540-R-03-001. As accessed at http://www.epa.gov/superfund/health/contaminants/lead/products.htm on 4 March 2013.

U.S. Environmental Protection Agency. 2013b. *Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSL Calculator)*. As accessed at http://epaprgs.ornl.gov/cgi-bin/chemicals/csl_search on 19 February. Prepared by EPA Office of Superfund and Oak Ridge National Laboratory.

Use Restriction Information

CAU Number/Description: CAU 204/Storage Bunkers
Applicable CAS Number/Description: CAS 05-33-01/Kay Blockhouse

Contact (DOE AL/Activity): Tiffany Lantow/Industrial Sites - EM

FFACO Use Restriction Physical Description:

Surveyed Area (UTM, Zone 11, NAD 83, meters):

UR Points	Northing	Easting
N/A		

Depth:

Survey Source (GPS, GIS, etc):

Basis for FFACO UR(s):

Summary Statement:_____

Contaminants Table:

Maximum Concentration of Contaminants for CAU XXX CAS xx-xx-xx, Title			
Constituent	**Maximum Concentration**	**Action Level**	**Units**

Site Controls:

Note: Effective upon acceptance of closure documents by NDEP

Use Restriction Information

Administrative Use Restriction Physical Description*:

Surveyed Area (UTM, Zone 11, NAD 83, meters):

UR Points	Northing	Easting
Southeast Corner	4,076,033.0	592,315.2
South 1	4,076,001.8	592,296.9
South 2	4,076,002.5	592,254.3
Southwest Corner	4,076,022.7	592,212.0
Northwest Corner	4,076,122.3	592,211.6
North Corner	4,076,145.8	592,248.7
Northeast Corner	4,076,101.9	592,306.0

Depth: 20 ft bgs

Survey Source (GPS, GIS, etc): GPS

*Coordinates for the Administrative Use Restriction exclude the area defined by the FFACO Use Restriction coordinates.

Basis for Administrative UR(s):

Summary Statement: This administrative UR is to protect site workers from inadvertent exposure to chemical contaminants (lead and RDX) above the IA FAL. As a best management practice, this administrative use restriction will prevent future (more intensive) use of the area. The analytical results and location of all samples collected are presented in the CR for CAU 204. Additional information is presented in *Recommendations and Justifications for Modifications to Downgrade Use Restrictions Established under the U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office Federal Facility Agreement and Consent Order* document.

Contaminants Table:

Maximum Concentration of Contaminants for CAU 204 CAS 05-33-01, Kay Blockhouse			
Constituent	**Maximum Concentration**	**Action Level**	**Units**
Lead	2,300	8,356	mg/kg
RDX (explosives)	170	2,960	mg/kg

Site Controls: This administrative UR area is established at the boundary identified by the coordinates listed above and depicted in the attached figure. No physical site controls are required for this administrative use restriction.

UR Maintenance Requirements (applies to both FFACO and Administrative UR(s) if Administrative UR exists):

Description: This administrative UR is recorded in the FFACO database, NNSA/NFO M&O GIS, and the NNSA/NFO CAU/CAS files. No site controls are required for this administrative UR other than the administrative controls for land use at the NNSS.

Inspection/Maintenance Frequency: N/A

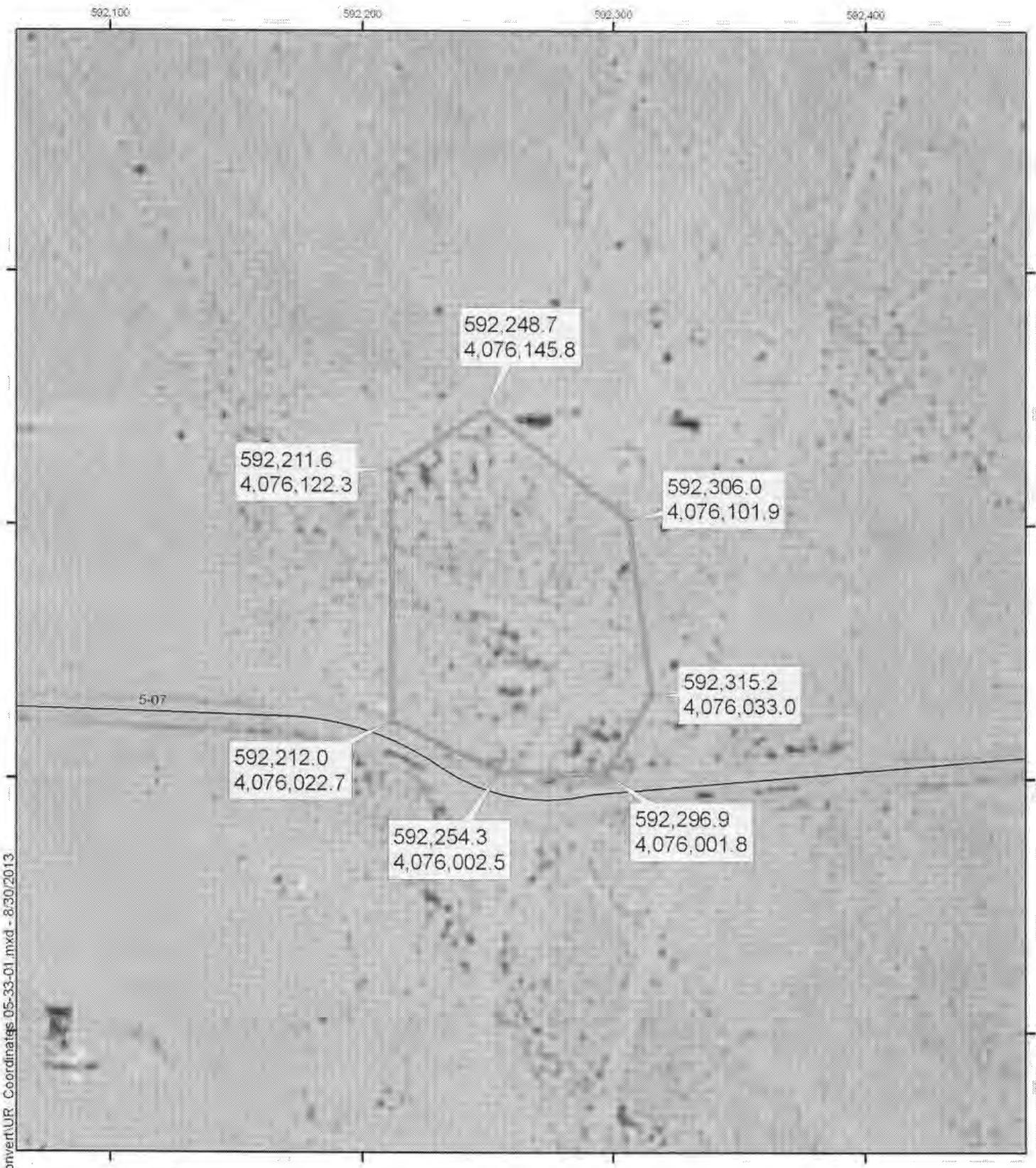
The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU CR or other CAU documentation unless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

Note: Effective upon acceptance of closure documents by NDEP

Use Restriction Information

Comments: Personnel are restricted from performing work in this location that would require any use of the area within the UR for activities that would result in a more intensive use of the site than the current land use (i.e., activities consistent with the occasional use exposure scenario). Activities included in the current land use would include short duration activities such as site visits, maintenance of the fence, radiological surveys, short duration radiological training, and retrieval of objects within the use-restricted area. Any activities to be conducted within this area that are not consistent with this defined current land use require the prior notification and approval of the NDEP.

Submitted By: /s/ Tiffany A. Lantow **Date:** 12/11/2013



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Administrative Use Restriction
CAU 137 CAS 05-33-01
Kay Blockhouse

Explanation

Administrative Use Restriction Boundary

0 25 50 100
Meters

0 100 200 400
Feet

N

Coordinate System: NAD 1983 UTM Zone 11N, Meter

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RECORD OF TECHNICAL CHANGE

Technical Change No. **DOE/NV—1117 ROTC-1** Page 1 of 1

Activity Name Industrial Sites Date 12/11/2013

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

Cathleen Birney (Name) N-I CAU Lead (Title)

Description of Change:
Downgrade the FFACO UR at CAU 204, CAS 05-18-02, Chemical Explosives Storage to an Administrative UR.

Justification:
Since this FFACO UR was established, practices and procedures relating to the implementation of risk-based corrective actions (RBCA) have changed. Therefore, this UR was re-evaluated against the current RBCA criteria as defined in the *Soils Risk-Based Corrective Action Evaluation Process*. This re-evaluation consisted of 1) assuming that the future land use for this CAS is Industrial Area (IA), 2) calculating the present-day activities of the original data used to define the need for the UR, and 3) using the current risk-based IA residual radioactive material guidelines (RRMGs) to calculate the total effective dose (TED). The risk-based RRMGs were developed using the current Soils RBCA process and the most current RRMGs for the IA exposure scenario. Although the average TED within this CAS is below the 25-millirem per IA-year constraint, which implies that the UR may be removed, depleted uranium is present at this CAS. The Administrative UR will protect against an inadvertent exposure to the depleted uranium. Therefore, the FFACO UR is being downgraded to an Administrative UR. See attached "Recommendation to Downgrade Use Restriction" for detailed information.

The task time will be unchanged by approximately 0 days.

Applicable Activity-Specific Document(s):
Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada

Approved By:

/s/ Tiffany A. Lantow Date 12/11/2013
Activity Lead

/s/ Robert F. Boehlecke Date 12/12/13
EM Operations Manager

/s/ Jeff MacDougall Date 12/17/13
NDEP

Nevada
Environmental
Management
Operations Activity

DOE/NV--1509-Rev.1

National Nuclear Security Administration

Recommendations and Justifications for Modifications To Downgrade Use Restrictions Established under the U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office *Federal Facility Agreement and Consent Order*

Controlled Copy No.: UNCONTROLLED
Revision No.: 1

October 2013

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/s/ Joseph P. Johnston, N-I CO 10/08/2013

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DOE/NV--1509-Rev.1

RECOMMENDATIONS AND JUSTIFICATIONS FOR MODIFICATIONS TO DOWNGRADE USE RESTRICTIONS ESTABLISHED UNDER THE U.S. DEPARTMENT OF ENERGY, NATIONAL NUCLEAR SECURITY ADMINISTRATION NEVADA FIELD OFFICE *FEDERAL FACILITY AGREEMENT AND CONSENT ORDER*

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

Controlled Copy No.: UNCONTROLLED

Revision No.: 1

October 2013

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RECOMMENDATIONS AND JUSTIFICATIONS
FOR MODIFICATIONS TO DOWNGRADE USE RESTRICTIONS ESTABLISHED
UNDER THE U.S. DEPARTMENT OF ENERGY,
NATIONAL NUCLEAR SECURITY ADMINISTRATION NEVADA FIELD OFFICE
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER

Approved by: /s/ Tiffany A. Lantow Date: 10/9/2013

Tiffany A. Lantow
Industrial Sites Activity Lead

Approved by: /s/ Robert F. Boehlecke Date: 10/9/2013

Robert F. Boehlecke
Environmental Management Operations Manager

5.0 CAU 204, CAS 05-18-02 – Chemical Explosives Storage

5.1 CAS Description

CAS 05-18-02, Chemical Explosives Storage, consists of the Sugar Bunker, a smaller adjacent bunker, and two cellar units that are adjacent to the south end of the Sugar Bunker. This bunker was used for various nonnuclear experiments conducted during the voluntary nuclear testing moratorium from 1958 to 1961. The area of the bunker is approximately 2,160 square feet. The Sugar Bunker is constructed of concrete and steel. There is a large ventilation system on the north end outside the entrance to the bunker. Inside the bunker, the floor is concrete. Steel beams are visible in the ceiling. Two cellar units, located to the south of the bunker, are constructed of steel coverings that are accessible from the southern exterior. The area surrounding the bunker is included in this CAS and comprises approximately 2 acres (NNSA/NSO, 2004b).

During closure activities, both bunker doors were closed and secured. The existing fence was repaired, and where needed, new fencing was installed to define the CAS boundary. In addition, the area was radiologically surveyed, and the existing radioactive material area (RMA) was extended to the CAS boundary and appropriately posted by the Radiological Control Demarcation and Maintenance program (NNSA/NSO, 2006a).

5.2 Current UR Description

The future use of any land related to this CAU is restricted from any DOE or USAF activity that may alter or modify the containment control as approved by the State of Nevada and identified in the CAU CR or other CAU documentation unless appropriate concurrence is obtained in advance. Twelve UR warning signs were posted along the existing fence; fencing is not required for the UR. Site monitoring requirements for the FFACO UR include annual visual inspections of UR signs (NNSA/NSO, 2006a).

5.3 Basis for Current UR

Environmental samples were analyzed for VOCs, SVOCs, RCRA metals, beryllium, TPH-DRO, TPH-GRO, PCBs, gamma spectroscopy, isotopic U, isotopic Pu, Sr-90, and explosives. Not all

samples were analyzed for the full suite of analytes. No VOCs, SVOCs, TPH-DRO, TPH-GRO, PCBs, RCRA metals, beryllium, isotopic Pu, Sr-90, or explosive were detected above PALs. The analytical results for soil samples indicate the presence of thorium (Th)-234, U-234, U-235, and U-238 contamination exceeding the PALs. Because Th-234 is a short-lived (24-day half-life) product of U-238, the two radionuclides should be in equilibrium through having the same activity; therefore, U-238 is considered the COC at this CAS (NNSA/NSO, 2004b). Table 5-1 contains analytical results of all COCs at CAS 05-18-02 that are the basis for the current UR. The sample matrix for all samples is soil.

Table 5-1
Sample Results for COCs at CAS 05-18-02 Used To Establish Current UR

Sample ID	Depth (ft bgs)	Th-234	U-234	U-235	U-238
		PAL 63.2 pCi/g	PAL 85.9 pCi/g	PAL 10.5 pCi/g	PAL 63.2 pCi/g
204D003	0.0 - 0.5	1,150 ± 190	284 ± 46 (J)	27.1 ± 6.6 (J)	1,400 ± 220 (J)
204D004	0.0 - 0.5	184 ± 31	--	--	212 ± 29
204D006	0.0 - 0.5	326 ± 55 (J)	202 ± 35 (J)	19 ± 4.5 (J)	780 ± 130 (J)
204D008	0.0 - 0.5	--	--	--	152 ± 24 (J)
204D010	0.0 - 0.5	266 ± 44	--	--	312 ± 45
204D012	0.0 - 0.5	91 ± 15	--	--	180 ± 26
204D018	0.0 - 0.5	71 ± 12	--	--	--
204D019	0.0 - 0.5	74 ± 13	--	--	70 ± 9.3
204D040A	7.0 - 8.0	84 ± 10	--	--	90 ± 16 (Y2, M3)
204D051	0.0 - 0.5	195 ± 24	107 ±19 (Y2, M3)	10.9 ± 2.8 (Y2, M3)	552 ± 92 (Y2, M3)
204D072	0.0 - 0.5	--	--	--	80 ± 14 (Y2, M3)
204D080	0.0 - 0.5	102 ± 12	--	--	117 ± 19 (M3)
204D083	0.0 - 0.5	116 ± 14	--	--	178 ± 29 (M3)
204D086	0.0 - 0.5	249 ± 30	86 ± 15 (M3)	--	303 ± 51 (M3)
204D093	1.0 - 2.0	--	--	--	193 ± 31 (M3)

J = Estimated value.
M3 = The requested minimum detectable concentration was not met, but the reported activity is greater than the reported minimum detectable concentration.
Y2 = Chemical yield outside default limits.
-- = No detects above original action levels.

The PALs for radiological contaminants were established in the ROTC to the CAIP (NNSA/NSO, 2004f) and were based on the NCRP Report No. 129 recommended screening limits for construction, commercial, and industrial land use scenarios (NCRP, 1999) scaled from 25- to 15-mrem/yr dose and the generic guidelines for residual concentration of radionuclides in DOE Order 5400.5 (DOE, 1993).

5.4 Basis for UR Modification

The assumption for this CAS is that the future land use is IA. The present-day radiological activities of U-234, U-235, and U-238 were calculated using the standard decay equation; the decay calculations take into account the half-life of the radionuclide and the time since the samples were originally collected. Radionuclide-specific FALs are referred to as RRMGs. These revised RRMGs are based on the 25-mrem/yr TED constraint, which represents the concentrations in soil for a specific radionuclide that would result in a 25-mrem/yr TED to a receptor for a specific exposure time.

Table 5-2 presents the present-day radiological activities, the revised IA RRMGs, and the TED of the radionuclides, which demonstrate that the TED is below the 25-mrem/yr TED constraint for the IA exposure scenario. Although the TED for sample 204D003 is close to the 25-mrem/yr TED constraint, the average dose of the four sample locations within the 1,000-square-meter (m^2)-diameter area surrounding sample 204D003 (per instructions in NNSA/NSO, 2012b) is 9.3 mrem/IA-yr (Figure 5-1). The average dose of the sample locations highlighted in Figure 5-1 is 5.6 mrem/IA-yr, which is below the 25-mrem/yr TED constraint.

5.5 Proposed Modification

Although the average TED of the area is below the 25-mrem/yr TED constraint, it was decided that rather than eliminating the FFACO UR at this CAS, the FFACO UR will be downgraded to an Administrative UR. This is because depleted U is present at the site. The Administrative UR will protect against an inadvertent exposure to the depleted U. Therefore, remove the FFACO UR and postings from this site; discontinue annual inspections; and change to an Administrative UR. These modifications will not affect or modify any non-FFACO requirements at this site.

Table 5-2
Present-Day Radiological Activities, IA RRMGs, and TED for COCs at CAS 05-18-02

Sample ID	Depth (ft bgs)	U-234	U-235	U-238	TED (mrem/IA-yr)
		IA RRMG 22,080 pCi/g	IA RRMG 284.0 pCi/g	IA RRMG 1,581 pCi/g	
204D003	0.0 - 0.5	284	27.1	1,400	24.85
204D004	0.0 - 0.5	--	--	212	3.35
204D006	0.0 - 0.5	202	19	780	14.24
204D008	0.0 - 0.5	--	--	152	2.4
204D010	0.0 - 0.5	--	--	312	4.93
204D012	0.0 - 0.5	--	--	180	2.85
204D019	0.0 - 0.5	--	--	70	1.11
204D040A	7.0 - 8.0	--	--	90	1.42
204D051	0.0 - 0.5	107	10.9	552	9.81
204D072	0.0 - 0.5	--	--	80	1.27
204D080	0.0 - 0.5	--	--	117	1.85
204D083	0.0 - 0.5	--	--	178	2.81
204D086	0.0 - 0.5	85	--	303	4.89
204D093	1.0 - 2.0	--	--	193	3.05

-- = No detects above original action levels.

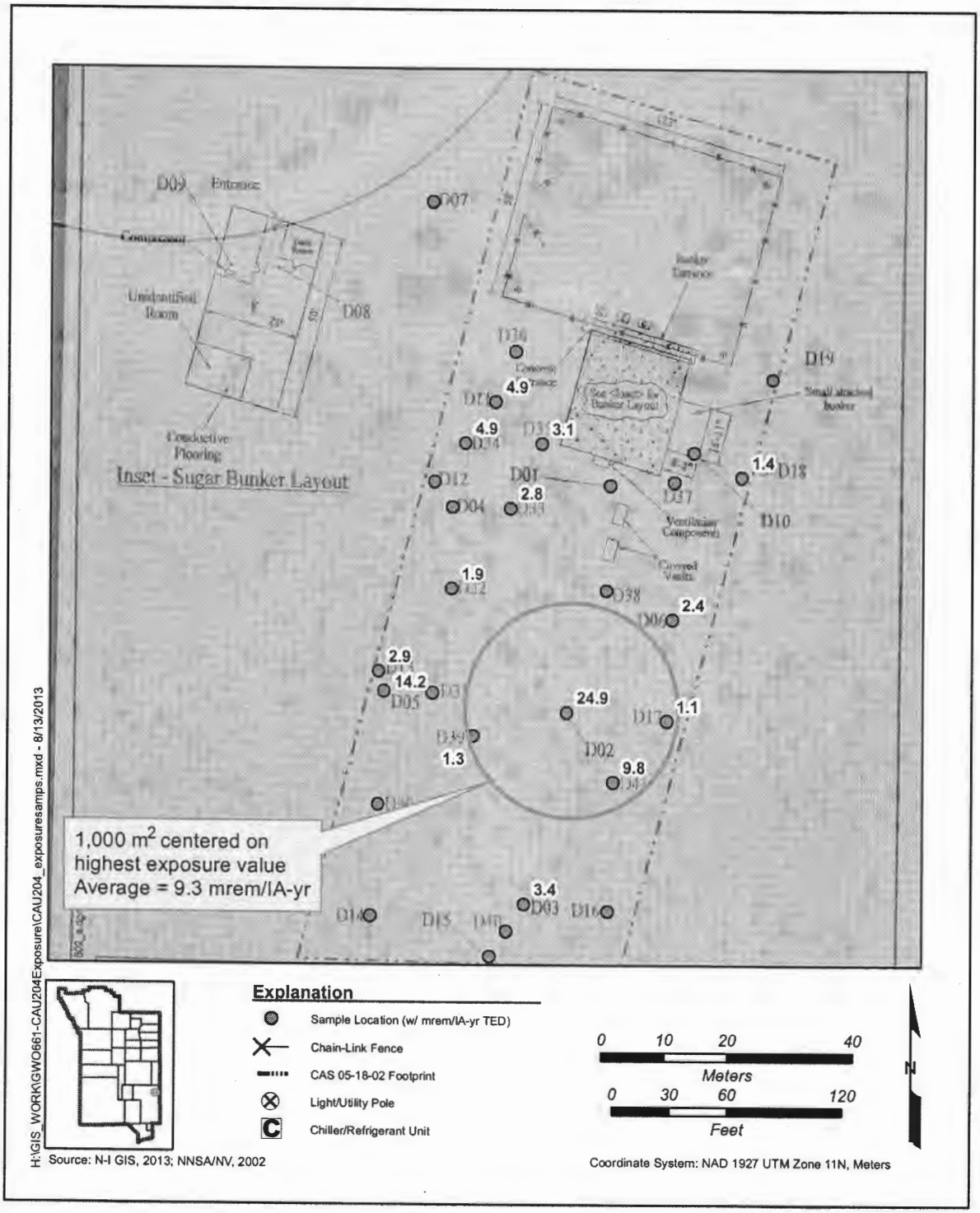

Figure 5-1
CAS 05-18-02 Sample Locations with IA-yr TED

References

DOE, see U.S. Department of Energy.

NCRP, see National Council on Radiation Protection and Measurements.

N-I GIS, see Navarro-Intera Geographic Information Systems.

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

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

National Council on Radiation Protection and Measurements. 1999. *Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies,* NCRP Report No. 129. Bethesda, MD.

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U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004b. *Corrective Action Decision Document for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada*, Rev. 0, DOE/NV--959. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004f. *Record of Technical Change to Corrective Action Investigation Plan for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada*, Rev. 0, DOE/NV--866-RTC1. Technical Change No. 1, 10 March. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2006a. *Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada,* Rev. 0, DOE/NV--1117. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2012b. *Soils Risk-Based Corrective Action Evaluation Process*, Rev. 0, DOE/NV--1475. Las Vegas, NV.

Use Restriction Information

CAU Number/Description: CAU 204/Storage Bunkers
Applicable CAS Number/Description: CAS 05-18-02/Chemical Explosives Storage

Contact (DOE AL/Activity): Tiffany Lantow/Industrial Sites - EM

FFACO Use Restriction Physical Description:

Surveyed Area (UTM, Zone 11, NAD 83, meters):

UR Points	Northing	Easting
N/A		

Depth:

Survey Source (GPS, GIS, etc):

Basis for FFACO UR(s):

Summary Statement:_____

Contaminants Table:

Maximum Concentration of Contaminants for CAU XXX CAS xx-xx-xx, Title			
Constituent	**Maximum Concentration**	**Action Level**	**Units**

Site Controls:

Use Restriction Information

Administrative Use Restriction Physical Description*:

Surveyed Area (UTM, Zone 11, NAD 83, meters):

UR Points	Northing	Easting
Southeast Corner	4,077,488	592,692
Southwest Corner	4,077,502	592,649
Northwest Corner	4,077,624	592,684
Northeast Corner	4,077,613	592,721
East 1 Corner	4,077,584	592,713
East 2 Corner	4,077,582	592,721

Depth: 5 ft bgs

Survey Source (GPS, GIS, etc): GPS

*Coordinates for the Administrative Use Restriction exclude the area defined by the FFACO Use Restriction coordinates.

Basis for Administrative UR(s):

Summary Statement: Although the average TED within this CAS is below the 25-millirem per IA-year constraint, which implies that the UR may be removed, depleted uranium is present at this CAS. This administrative UR is to protect site workers from inadvertent exposure to depleted uranium on the soil surface. It is unknown if there is depleted uranium at depth. As a best management practice, this administrative use restriction will prevent future (more intensive) use of the area. Additional information is presented in *Recommendations and Justifications for Modifications to Downgrade Use Restrictions Established under the U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office Federal Facility Agreement and Consent Order* document.

Contaminants Table:

Maximum Concentration of Contaminants for CAU 204 CAS 05-18-02, Chemical Explosives Storage			
Constituent	**Maximum Concentration**	**Action Level**	**Units**
Depleted Uranium	N/A	N/A	N/A

Site Controls: This administrative UR area is established at the boundary identified by the coordinates listed above and depicted in the attached figure. No physical site controls are required for this administrative use restriction.

UR Maintenance Requirements (applies to both FFACO and Administrative UR(s) if Administrative UR exists):

Description: This administrative UR is recorded in the FFACO database, NNSA/NFO M&O GIS, and the NNSA/NFO CAU/CAS files. No site controls are required for this administrative UR other than the administrative controls for land use at the NNSS.

Inspection/Maintenance Frequency: N/A

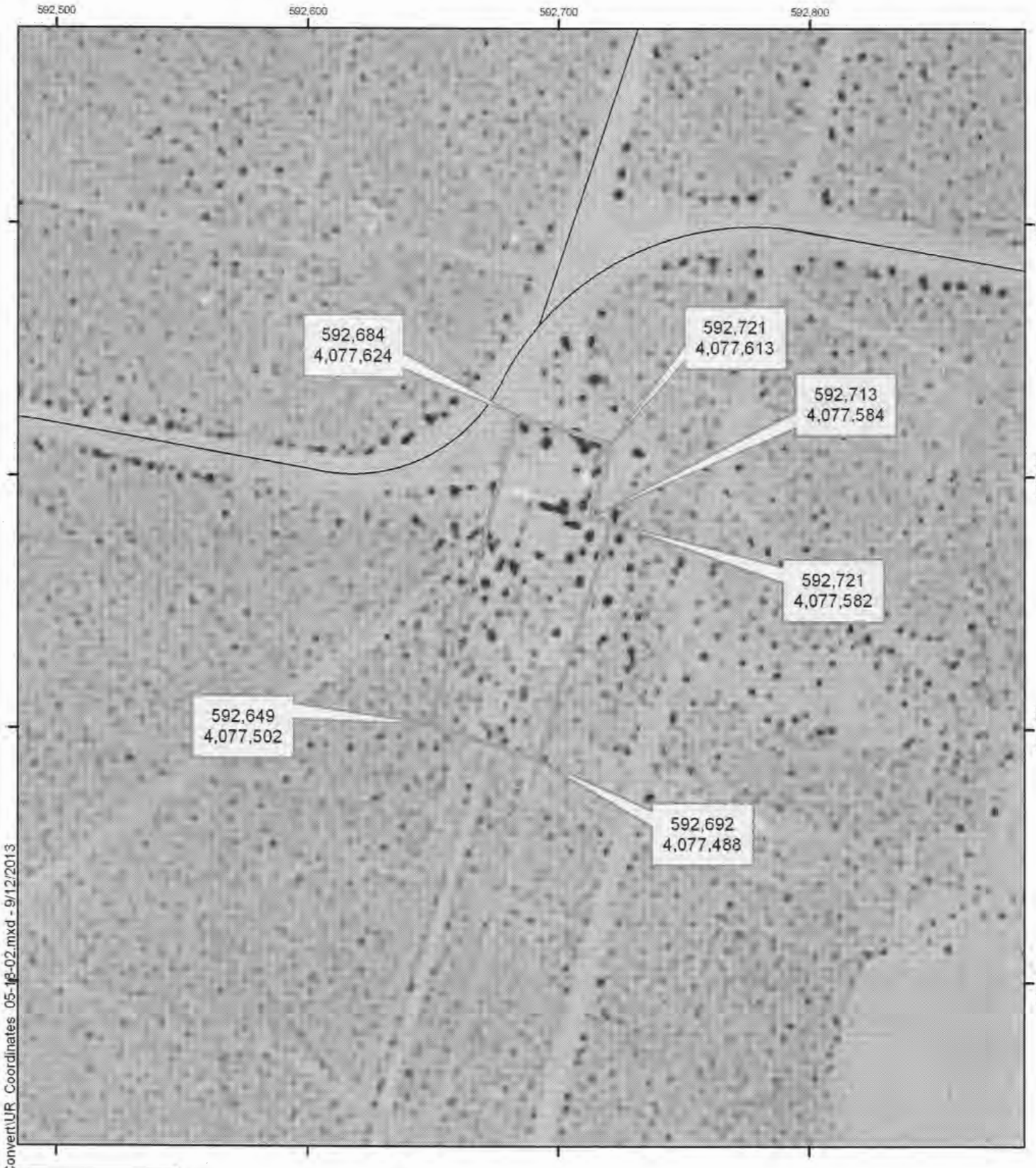
The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU CR or other CAU documentation unless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

Note: Effective upon acceptance of closure documents by NDEP

Use Restriction Information

Comments: Personnel are restricted from performing work in this location that would require any use of the area within the UR for activities that would result in a more intensive use of the site than the current land use (i.e., activities consistent with the occasional use exposure scenario). Activities included in the current land use would include short duration activities such as site visits, maintenance of the fence, radiological surveys, short duration radiological training, and retrieval of objects within the use-restricted area. Any activities to be conducted within this area that are not consistent with this defined current land use require the prior notification and approval of the NDEP.

Submitted By: /s/ Tiffany A. Lantow **Date:** 12/11/2013



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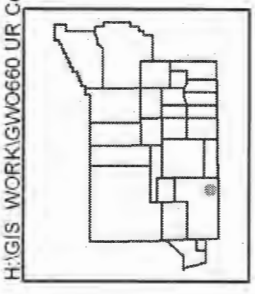

Administrative Use Restriction
CAU 204 CAS 05-18-02
Chemical Explosives Storage

Explanation

Administrative Use Restriction Boundary

0 25 50 100
Meters

0 100 200 400
Feet

N

Coordinate System: NAD 1983 UTM Zone 11N, Meter

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National Nuclear Security Administration

Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada

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CLOSURE REPORT FOR CORRECTIVE ACTION UNIT 204: STORAGE BUNKERS, NEVADA TEST SITE, NEVADA

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

Controlled Copy No. UNCONTROLLED
Revision: 0
April 2006

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CLOSURE REPORT FOR
CORRECTIVE ACTION UNIT 204:
STORAGE BUNKERS, NEVADA TEST SITE, NEVADA

Approved By: /s/ Sabine Curtis Date: 3-30-06

Sabine Curtis,
Acting Federal Industrial Sites Sub-Project Director
Environmental Restoration Project

Approved By: /s/ Janet Appenzeller-Wing Date: 3/30/06

Janet Appenzeller-Wing, Federal Project Director
Environmental Restoration Project

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TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

FIGURES

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

BMP	best management practice
BN	Bechtel Nevada
CADD	Corrective Action Decision Document
CAIP	Corrective Action Investigation Plan
CAP	Corrective Action Plan
CAS(s)	Corrective Action Site(s)
CAU	Corrective Action Unit
COC(s)	contaminant(s) of concern
CR	Closure Report
CSM(s)	conceptual site model(s)
DOE	U.S. Department of Energy
DOE/NV	U.S. Department of Energy, Nevada Operations Office (used prior to April 2001)
DQO(s)	Data Quality Objective(s)
EPA	U.S. Environmental Protection Agency
FFACO	Federal Facility Agreement and Consent Order
ft^2	square feet
LLW	low-level waste
m^2	square meters
m^3	cubic meter(s)
mg/kg	milligram(s) per kilogram
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
pCi/g	picoCuries per gram
PAL(s)	preliminary action level(s)
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
ROTC	Record of Technical Change

ACRONYMS AND ABBREVIATIONS (continued)

RMA	Radioactive Materials Area
SDG	Sample Delivery Group
SVOC	semi-volatile organic compound(s)
TCLP	Toxicity Characteristic Leaching Procedure
UR	Use Restriction
VOC	volatile organic compound(s)
yd^3	cubic yard(s)

EXECUTIVE SUMMARY

Corrective Action Unit (CAU) 204, Storage Bunkers, is identified in the *Federal Facility Agreement and Consent Order* (FFACO) of 1996 and consists of six Corrective Action Sites (CASs) located in Areas 1, 2, 3, and 5 on the Nevada Test Site (NTS). CAU 204 includes:

- CAS 01-34-01, Underground Inst. House Bunker
- CAS 02-34-01, Instrument Bunker
- CAS 03-34-01, Underground Bunker
- CAS 05-18-02, Chemical Explosives Storage
- CAS 05-33-01, Kay Blockhouse
- CAS 05-99-02, Explosive Storage Bunker

CAU 204 closure activities were conducted from July 18, 2005, to August 31, 2005, according to the Nevada Division of Environmental Protection-approved Corrective Action Plan for CAU 204 (U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office, 2004b). All waste generated during the closure of CAU 204 was managed and disposed appropriately.

CAU 204 closure activities included:

- CAS 01-34-01: Securing bunker doors, posting Use Restriction (UR) warning signs, and implementing a UR.
- CAS 02-34-01: Securing bunker doors, posting UR warning signs, and implementing a UR.
- CAS 03-34-01: Securing bunker doors, posting UR warning signs, and implementing a UR.
- CAS 05-18-02: Securing two bunker doors, repairing existing fencing and installing new fencing to define the CAS boundary, posting UR warning signs along the fence and bunker and implementing a UR. In addition, the Radioactive Materials Area was redefined and extended beyond the CAS boundary by the NTS Radiological Control Demarcation and Maintenance program.
- CAS 05-33-01: Removing and disposing asbestos, lead-impacted soil, and radiologically-impacted soil, collecting and analyzing soil verification samples from excavations, backfilling and grading excavations, installing fencing around the bunker entrance to restrict access, backfilling two steel lined pits with soil and concrete, posting UR signs, and implementing a UR.
- CAS 05-99-02: Demolishing a storage bunker, removing wooden debris, and grading area to original contours.

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1.0 INTRODUCTION

This Closure Report (CR) documents the closure activities performed for Corrective Action Unit (CAU) 204, Storage Bunkers, according to the *Federal Facility Agreement and Consent Order* (FFACO) of 1996. CAU 204 consists of six Corrective Action Sites (CASs) located in Areas 1, 2, 3, and 5 of the Nevada Test Site (NTS) (Figure 1). The NTS is located approximately 105 kilometers (65 miles) northwest of Las Vegas, Nevada. Site closure activities were performed according to the Nevada Division of Environmental Protection (NDEP)-approved Corrective Action Plan (CAP) for CAU 204 (U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office [NNSA/NSO], 2004b. CAU 204 consists of the following CASs:

- CAS 01-34-01, Underground Inst. House Bunker
- CAS 02-34-01, Instrument Bunker
- CAS 03-34-01, Underground Bunker
- CAS 05-18-02, Chemical Explosives Storage
- CAS 05-33-01, Kay Blockhouse
- CAS 05-99-02, Explosive Storage Bunker

1.1 PURPOSE

CAU 204, Storage Bunkers, consists of six CASs located in Areas 1, 2, 3, and 5 of the NTS (Figure 1). The sites were characterized in 2003 according to the approved CAU 204 Corrective Action Investigation Plan (CAIP) (U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office [NNSA/NV], 2002a), and the results of the investigation are presented in the CAU 204 Corrective Action Decision Document (CADD) (NNSA/NSO, 2004a). The approved closure alternatives for the CAU 204 CASs included No Further Action and Closure in Place with Administrative Controls. The purpose of this CR is to document the CAU 204 closure activities and to provide data confirming that the closure requirements were met.

1.2 SCOPE

Previous site characterization work done in 2003 indicated that several sites exceeded the action levels for organic, inorganic, and radionuclide contamination, and one site contained friable asbestos (NNSA/NSO, 2004a).

The closure strategy for CAU 204, as specified in the NDEP-approved CAP (NNSA/NSO, 2004b), was as follows:

- CAS 01-34-01, Underground Inst. House Bunker: The site was closed in place with administrative controls. The bunker door was closed and secured. Use Restriction (UR) warning signs were posted, and a UR was implemented.

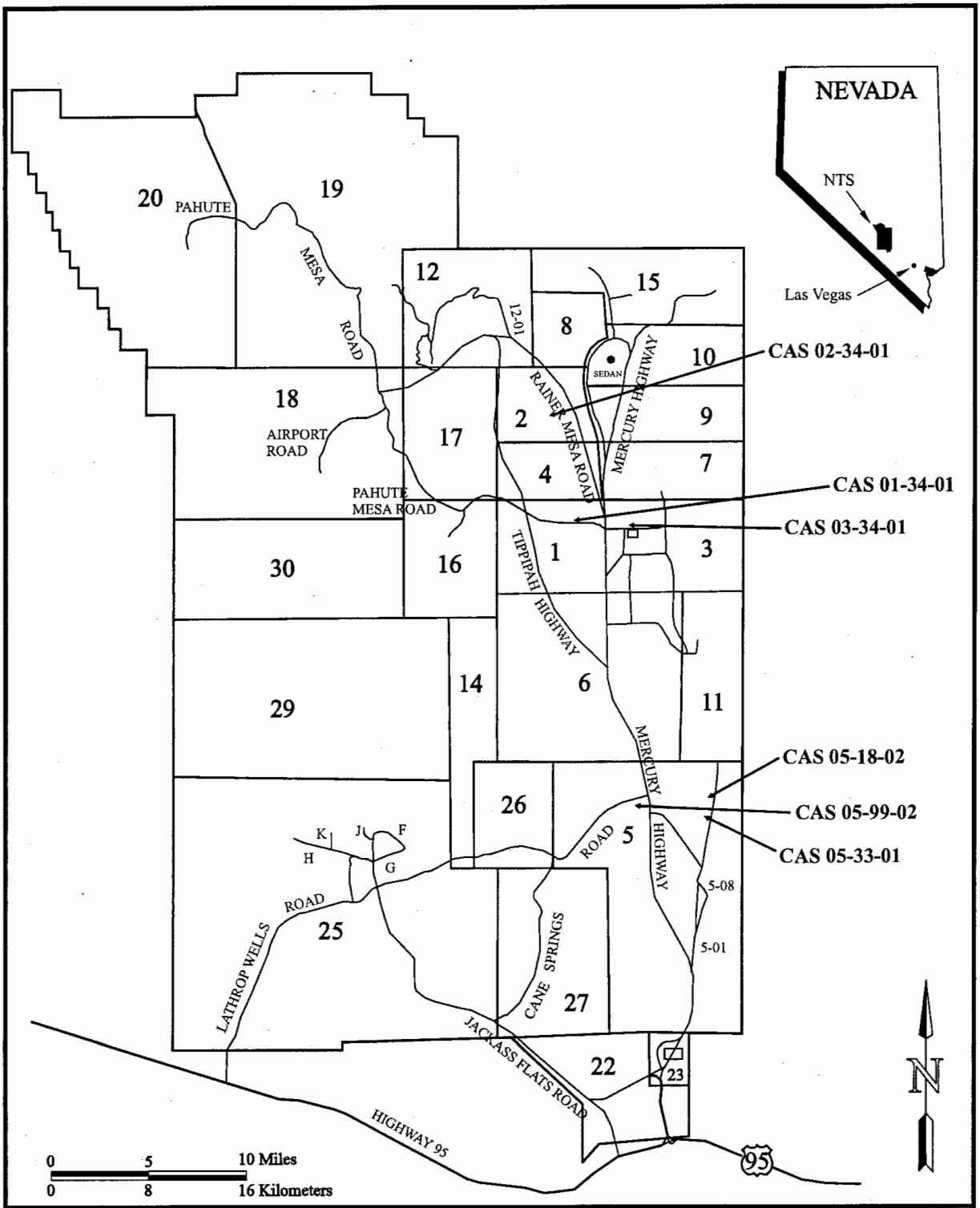

FIGURE 1
CAU 204 SITE LOCATION MAG

- CAS 02-34-01, Instrument Bunker: The site was Closed in Place with Administrative Controls. The bunker door was closed and secured. UR warning signs were posted, and a UR was implemented.
- CAS 03-34-01, Underground Bunker: The site was Closed in Place with Administrative Controls. The bunker door was closed and secured. UR warning signs were posted, and a UR was implemented.
- CAS 05-18-02, Chemical Explosives Storage: The site was Closed in Place with Administrative Controls. Both bunker doors were closed and secured. The existing fence was repaired, and where needed, new fencing installed to define the CAS boundary. UR warning signs were posted along the fence and a UR was implemented. In addition, the area was radiologically surveyed and the existing Radioactive Materials Area (RMA) was extended to the CAS boundary and appropriately posted by NTS Radiological Control Demarcation and Maintenance program.
- CAS 05-33-01, Kay Blockhouse: The site was Closed in Place with Administrative Controls. Lead-impacted and radiologically-impacted soil was removed from two locations and verification soil samples collected from excavated areas to verify cleanup criteria were met. Asbestos from two burn pits was removed and disposed, and two steel-lined pits were closed in place by filling with soil and concrete. The bunker entrance was secured by installing a gate and fence around the entrance, and the bunker and berm area was fenced. UR warning signs were posted along the bunker and berm fence and a UR was implemented. The RMA was extended beyond the CAS boundary and appropriately posted by the NTS Radiological Control Demarcation and Maintenance program.
- CAS 05-99-02, Explosive Storage Bunker: No further action was required at this site (NNSA/NSO, 2004b). As a best management practice (BMP), the bunker was demolished, all debris was removed and disposed, and the area was graded to original contours.

1.3 Closure Report Contents

This CR includes 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
- Appendix A - Data Quality Objectives
- Appendix B - Sample Analytical Results
- Appendix C - Waste Disposition Documentation
- Appendix D - Use Restriction Information

- APPENDIX E - SITE CLOSURE PHOTOGRAPHS
- APPENDIX F - NATIONAL ENVIRONMENTAL POLICY ACT CHECKLIST
- APPENDIX G - APPROVED RECORD OF TECHNICAL CHANGES
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This report was developed using information and guidance from the following documents:

- CAU 204 CADD (NNSA/NSO, 2004a)
- CAU 204 CAP (NNSA/NSO, 2004b)
- Industrial Sites Quality Assurance Project Plan (QAPP) (U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office [NNSA/NV], 2002b)

1.3.1 Data Quality Objectives

The data quality objectives (DQOs) used for closure of CAU 204 were presented in Appendix A of the CAU 204 CAIP (NNSA/NV, 2002a) and are included as Appendix A of this report.

Three conceptual site models (CSMs), as presented in the CAIP (NNSA/NV, 2002a), were developed for CAU 204. These CSMs assumed that contamination would be attributable to a release to the interior of the bunkers, or to the surface or su-surface soils. CAS 05-99-02 has a dirt floor, and CAS 05-33-01 has a wooden floor; the interiors of all other bunkers and structures have concrete floors and walls.

CAU 204 characterization activities presented in the CADD (NNSA/NSO, 2004a) determined that actual site conditions were consistent with the CSMs developed during the DQO process. Closure activities also indicated that the CSMs were accurate. Details of the DQO assessment are included in Section 4.1 of this report.

2.0 CLOSURE ACTIVITIES

This section details the specific closure activities completed during the closure of CAU 204, Storage Bunkers. Copies of the analytical data reports are included in Appendix B and photographs taken before and after closure activities in Appendix E.

2.1 DESCRIPTION OF CORRECTIVE ACTION ACTIVITIES

2.1.1 Preplanning and Site Preparation

Closure activities for CAU 204 were completed using the NDEP-approved CAP (NNSA/NSO, 2004b). Prior to site closure activities, the following pre-field activities were completed:

- Preparation of National Environmental Policy Act documentation (checklist)
- Preparation of the Site-Specific Health and Safety Plan
- Preparation of NNSA/NSO Real Estate/Operations Permits
- Preparation of required Bechtel Nevada (BN) work permits
- Preparation of BN work control packages

2.1.2 Closure Activities

Closure activities were conducted from July 18, 2005, to August 31, 2005, by the BN Environmental Restoration group. The following sections detail the activities completed at each CAS.

2.1.2.1 CAS 01-34-01, Underground Inst. House Bunker

CAS 01-34-01 consists of an underground concrete bunker with a footprint of approximately 178 square meters (m^2) (1,920 square feet [ft^2]) located in Area 1 of the NTS (Figure 2). The front ramp of the bunker is covered with asphalt, and the remainder of the bunker is covered with soil. The approved closure alternative for this CAS is Closure in Place with Administrative Controls (NNSA/NSO, 2004a).

The entrance to the bunker was secured with a lock, and UR warning signs were posted to address interior bunker contamination and warn against any intrusive activity. UR signs were posted according to the FFACO Use Restriction Posting Guidance (FFACO, 2003). Details regarding the implemented use restriction are included in Appendix D. Annual site inspections will be required to ensure that the UR signs are in good condition and that the UR has been maintained.

2.1.2.2 CAS 02-34-01, Instrument Bunker

CAS 02-34-01 consists of a subsurface concrete structure with a footprint of approximately 178 m^2 (1,920 ft^2) located in Area 2 of the NTS (Figure 3). A small bunker, Bunker 2-300, is attached to the main bunker and is also constructed of concrete. In addition, a small building adjacent to the main bunker referred to as Station 2-63 is also included in the CAS. The bunker

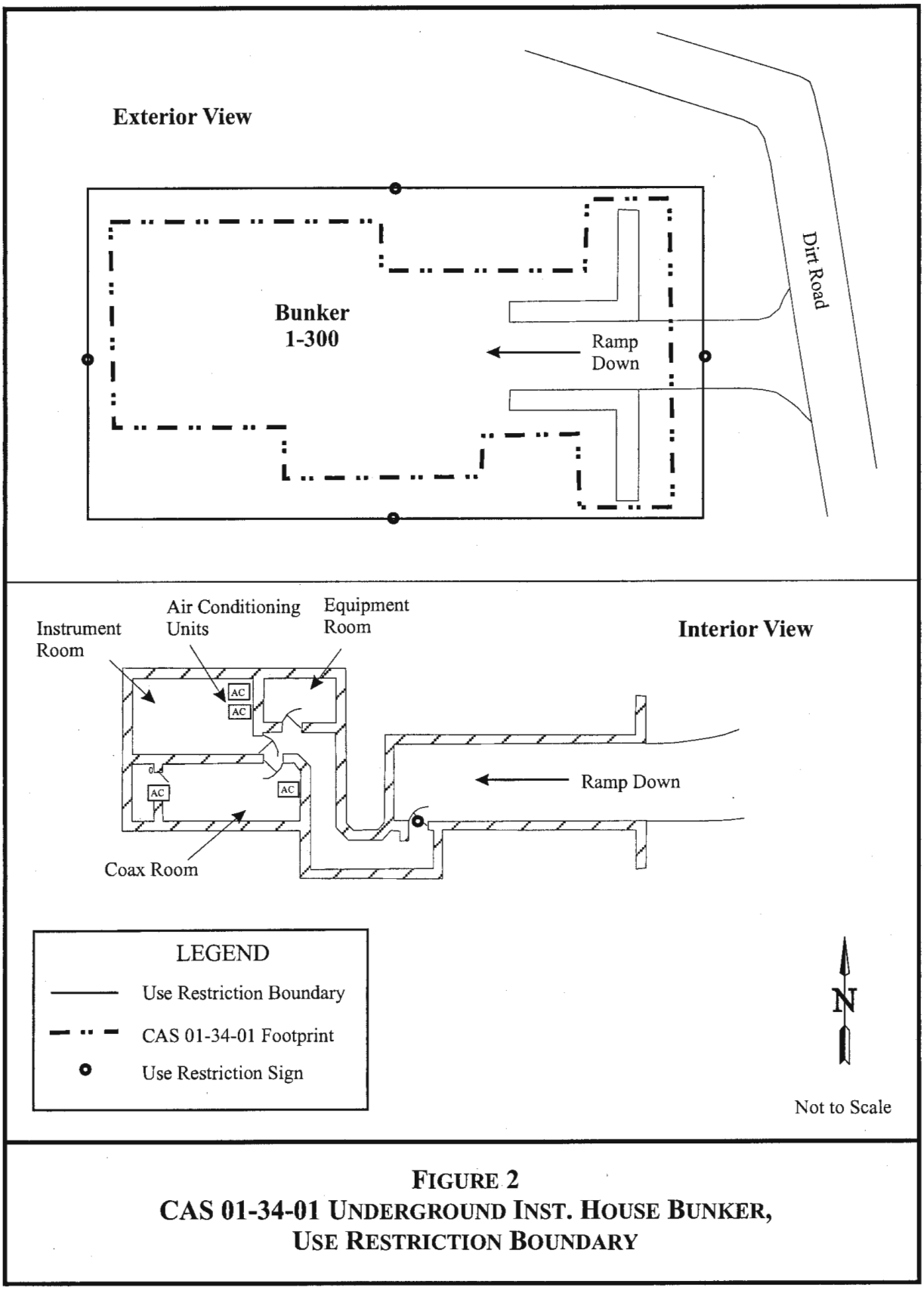


FIGURE 2
CAS 01-34-01 UNDERGROUND INST. HOUSE BUNKER,
USE RESTRICTION BOUNDARY

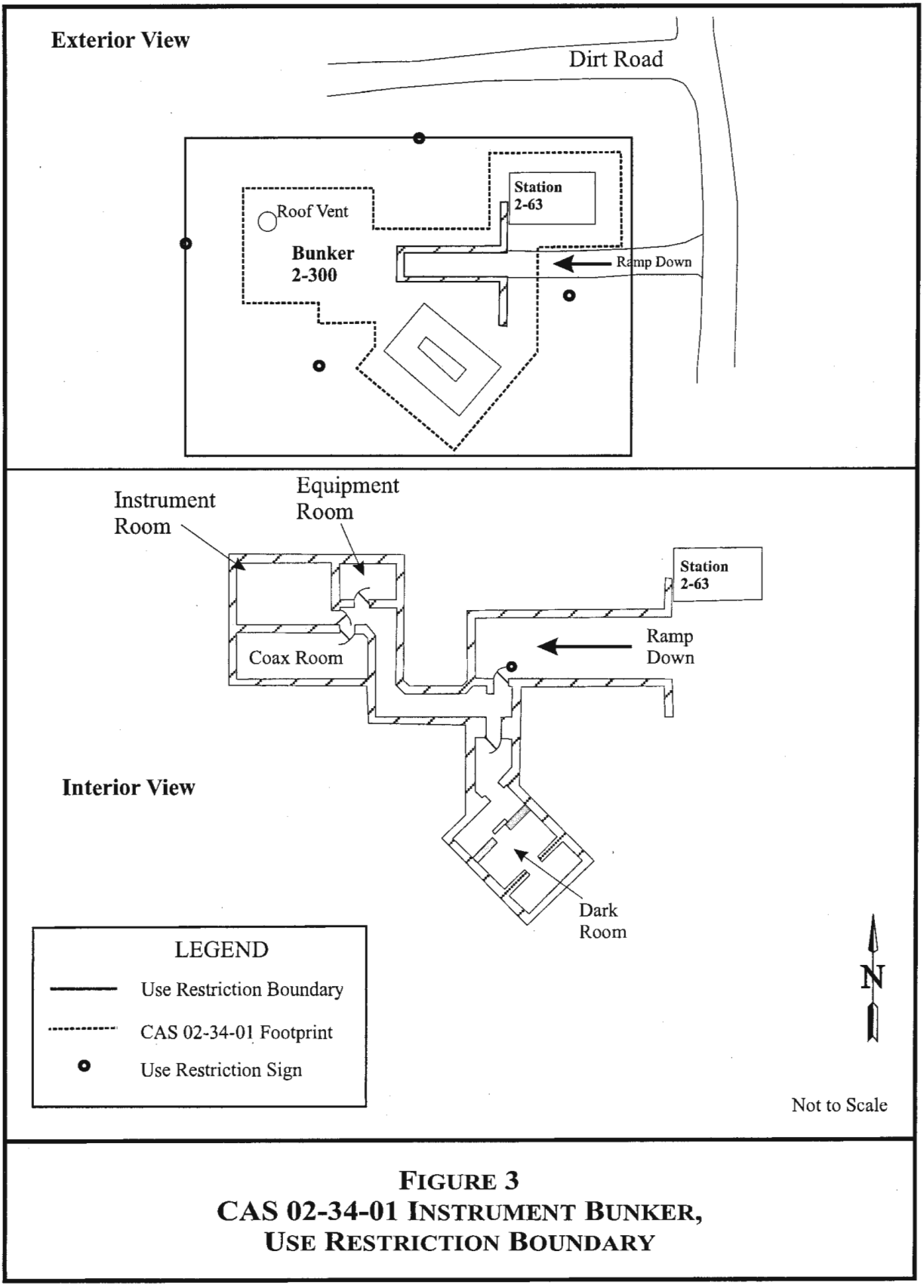


FIGURE 3
CAS 02-34-01 INSTRUMENT BUNKER,
USE RESTRICTION BOUNDARY

consists of four rooms; the front sloped portion of the roof is covered with asphalt while the reminder is covered with soil. The approved closure alternative for this CAS is Closure in Place with Administrative Controls (NNSA/NSO, 2004a).

The entrance to the bunker was closed and secured with a lock to restrict access. UR warning signs were posted to address interior bunker contamination and warn against any intrusive activity. UR signs were posted according to the FFACO Use Restriction Posting Guidance (FFACO, 2003). Details regarding the implemented use restriction are included in Appendix D. Annual site inspections will be required to ensure that the signs are in good condition and the UR has been maintained.

2.1.2.3 CAS 03-34-01, Underground Bunker

CAS 03-34-01 consists of a subsurface concrete structure with a footprint of approximately 108 m^2 (1,160 ft^2) located in Area 3 of the NTS (Figure 4). The bunker consists of three rooms; the front is covered with asphalt and the remainder with soil. The approved closure alternative for this CAS is Closure in Place with Administrative Controls (NNSA/NSO, 2004a).

All entrances to the bunker were secured and UR warning signs were posted to address interior bunker contamination and warn against any intrusive activity. UR signs were posted according to the FFACO Use Restriction Posting Guidance (FFACO, 2003). Details regarding the implemented use restriction are included in Appendix D. Annual site inspections will be required to ensure that the signs are in good condition and the UR has been maintained.

2.1.2.4 CAS 05-18-02, Chemical Explosives Storage

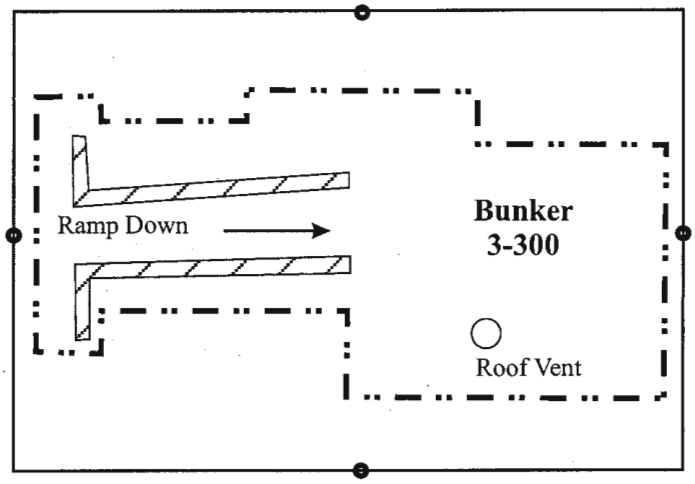
CAS 05-18-02 consists of the Sugar Bunker, a smaller adjacent bunker, and two underground steel vaults located in Area 5 of the NTS (Figure 5). The bunker is approximately 200 m^2 (2,160 ft^2). In addition, approximately 8,094 m^2 (87,120 ft^2) of surrounding property is included in the CAS. The approved closure alternative for this CAS is Closure in Place with Administrative Controls (NNSA/NSO, 2004a).

Both bunkers were closed and secured with locks. Portions of the existing CAS fence were repaired as needed and new fencing was installed to enclose the CAS. UR warning signs were posted at the bunker entrance and along the CAS perimeter to warn against intrusive activity according to the FFACO Use Restriction Posting Guidance (FFACO, 2003). In addition, the RMA was redefined and extended beyond the CAS boundary by the NTS Demarcation program. Details regarding the implemented use restriction are included in Appendix D. Annual site inspections will be required, to ensure that the signs are in good condition and the UR has been maintained.

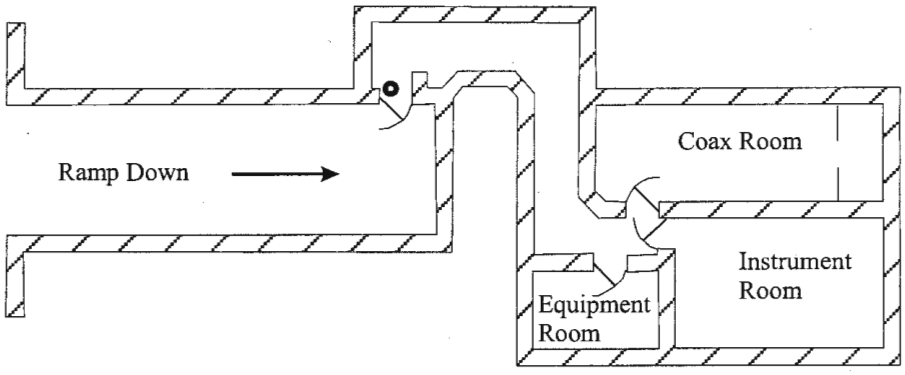
2.1.2.5 CAS 05-33-01, Kay Blockhouse

CAS 05-33-01 is located in Area 5 of the NTS and consists of the Kay Blockhouse and discrete test areas surrounding the Kay Blockhouse (Figure 6). The entire CAS covers an area of approximately 44,514 m^2 (479,162 ft^2). The Kay Blockhouse is constructed of concrete with a wooden door that has been determined to be unsafe for entry. Approximately 5.1 to10.2 centimeters (2 to 4 inches) of soil has been deposited over time on the bunker floor.

Exterior View



Interior View



LEGEND

- Use Restriction Boundary
- CAS 03-34-01 Footprint
- Use Restriction Sign

N

Not to Scale

FIGURE 4
CAS 03-34-01 UNDERGROUND BUNKER,
USE RESTRICTION BOUNDARY

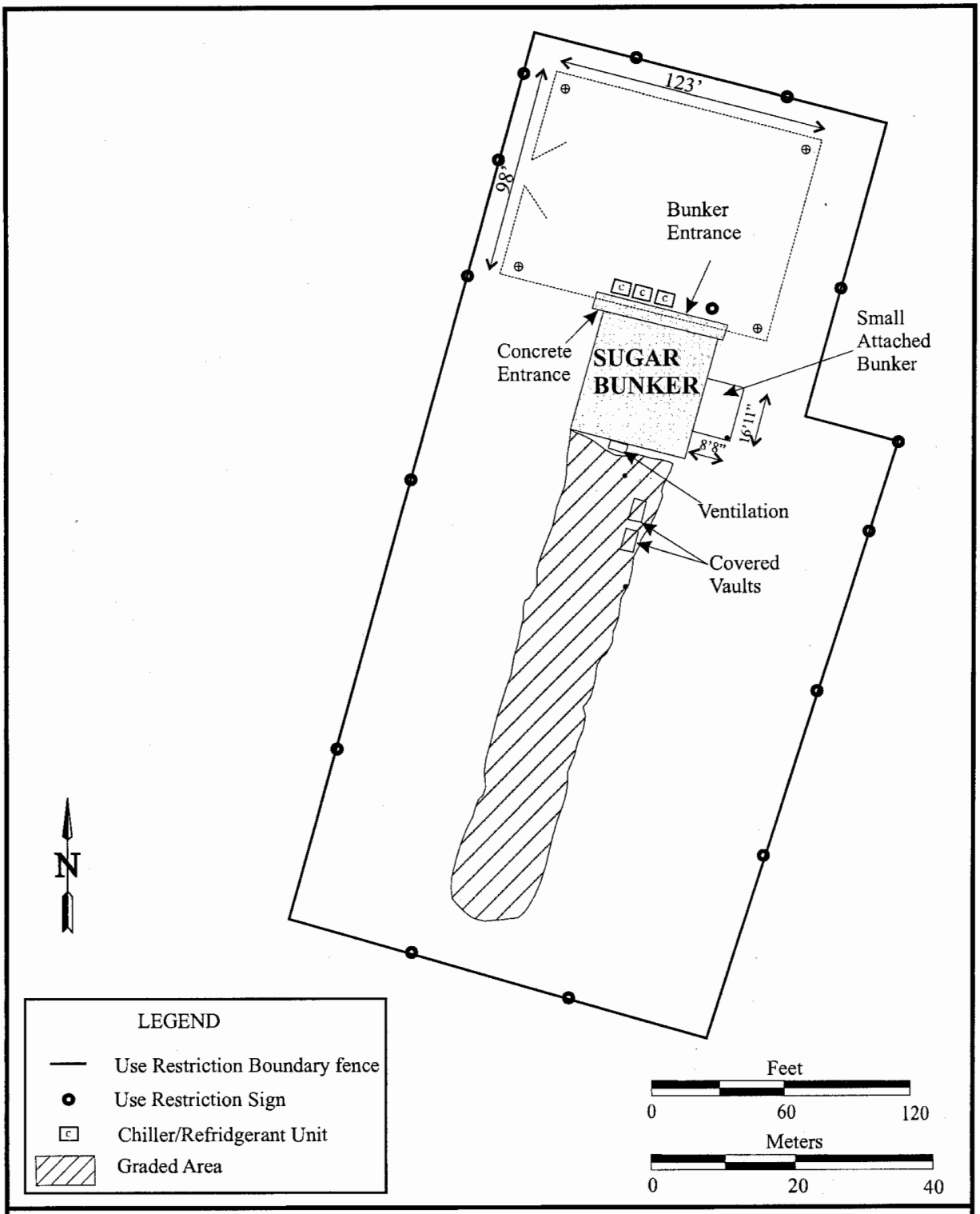


FIGURE 5
CAS 05-18-02 CHEMICAL EXPLOSIVES STORAGE,
USE RESTRICTION BOUNDARY

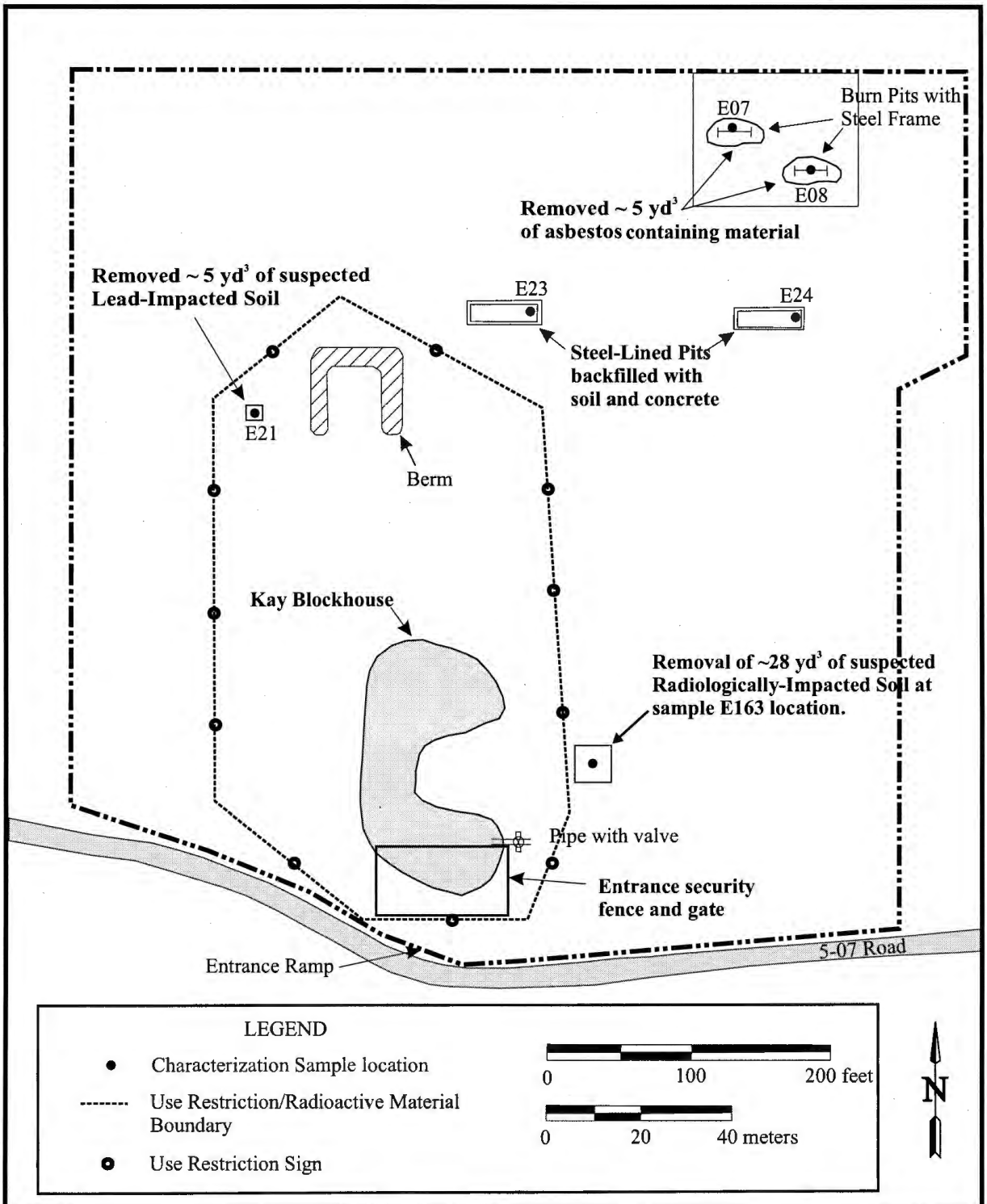


FIGURE 6
CAS 05-33-01 KAY BLOCKHOUSE,
USE RESTRICTION BOUNDARY

This site contained several areas of soil contaminated with lead and radionuclides, one location with Royal Demolition Explosive, and several objects containing friable asbestos (NNSA/NSO, 2004a). The approved closure alternative for this site is Closure in Place with Administrative Controls (NNSA/NSO, 2004a).

Approximately 3 cubic meters (m^3) (4 cubic yards [yd^3]) of suspected lead-impacted soil was removed from the vicinity of characterization sample location E21 (Figure 6) and loaded into a B25 Box for disposal. Analytical results for waste classification samples collected from the excavated soil showed that the soil was not hazardous for lead, and the soil was transported to the NTS Area 9 U10c Landfill for disposal.

Six soil verification samples, including one blind duplicate, were collected from the E21 excavation (Figure 7) and shipped to an offsite laboratory for total lead analysis. The results indicated that no lead exceeding the preliminary action level (PAL) (U.S. Environmental Protection Agency [EPA], 2002) remained onsite, and the excavation was backfilled with native fill.

In addition, suspected radiologically-impacted soil was removed from the vicinity of characterization sample location E163 (Figure 6). Approximately 21 m^3 (28 yd^3) of soil was excavated and placed in four soft-sided containers for disposal. Waste classification samples were collected and analyzed for radiological contaminants of concern (COCs). Analytical results indicated that all radiological COCs were less than NTS Waste Acceptance Criteria, and the waste was transported to the NTS Area 9 U10c Landfill for disposal.

Twelve soil verification samples, including two blind duplicate samples, were collected from the base of low-level waste (LLW) soil excavation (Figure 7) and shipped to an offsite laboratory for analysis. Six samples were analyzed for gamma emitters, and six samples were analyzed for isotopic uranium. Analytical results verified that no radionuclides remained onsite at levels greater than PALs, and the excavation was backfilled with native fill.

Approximately 4 m^3 (5 yd^3) of friable asbestos material was removed from the two burn pits and wrapped in plastic. The asbestos material and steel frames from the burn pits were disposed at the NTS Area 23 Sanitary Landfill. In addition, the two steel-lined pits were closed in place by filling the void space with native fill and capped with 1.5 feet of concrete.

The bunker was secured by installing security fencing and gate around the entrance to the bunker. In addition, the RMA was re-established by NTS Radiological Control Demarcation and Maintenance personnel, and fenced with T-post and wire-rope fencing. UR warning signs were posted along the fence to address contamination and warn against intrusive activity according to the FFACO Use Restriction Posting Guidance (FFACO, 2003). Details regarding the implemented use restriction are included in Appendix D. Annual site inspections will be required to ensure that the signs are in good condition and the UR has been maintained.

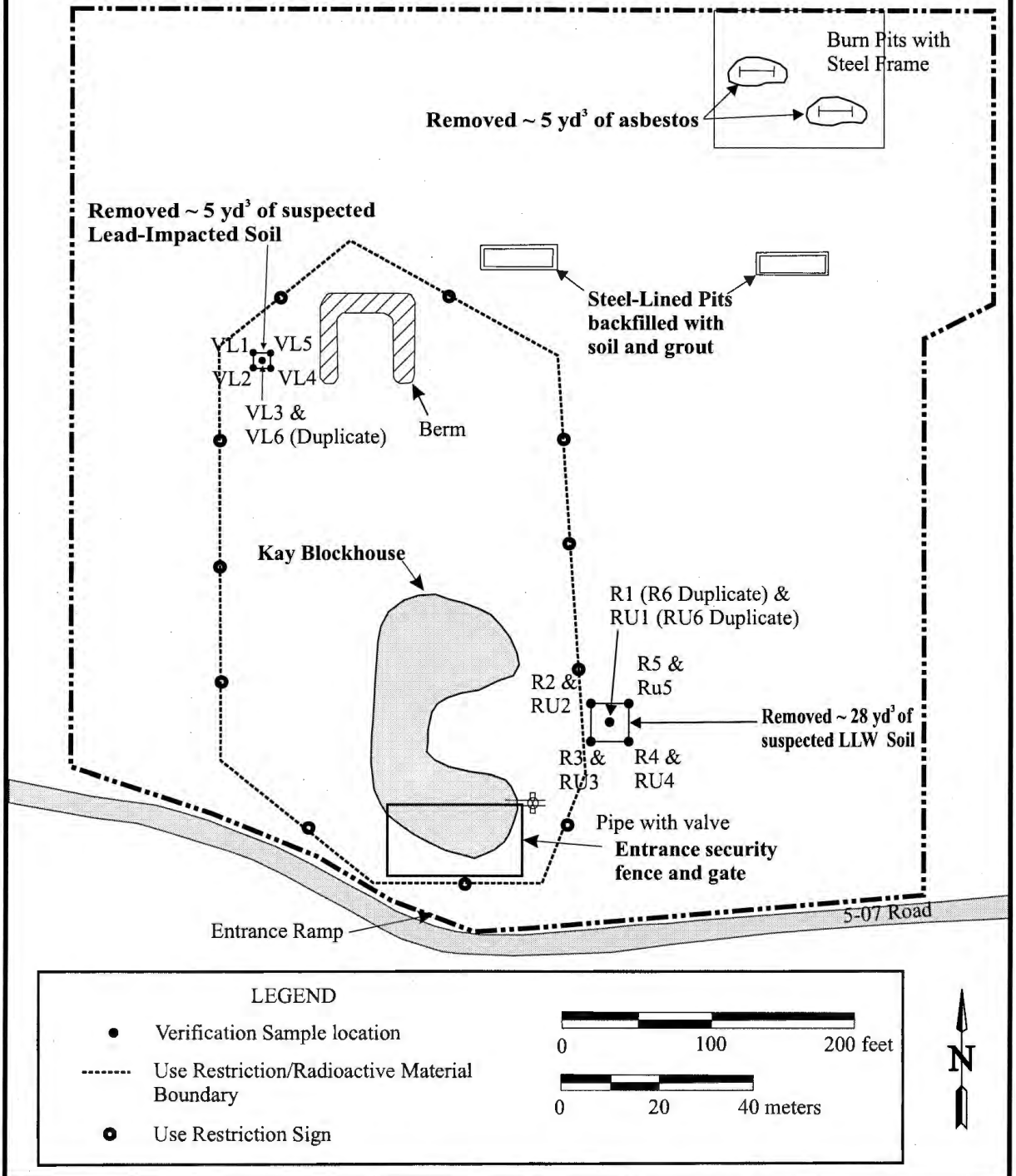


FIGURE 7
CAS 05-33-01 KAY BLOCKHOUSE,
VERIFICATION SAMPLE LOCATIONS

CAS 05-99-02, Explosive Storage Bunker

CAS 05-99-02 consisted of a small bunker that was used to store conventional explosives and ammunition. The bunker was built directly into a small hillside on the edge of Cane Spring Wash in Area 5 of the NTS (Figure 8). No COCs were identified during site characterization (NNSA/NSO, 2004b). As a BMP the bunker was demolished, all debris was removed and disposed, and the site was graded to the approximate original site contours.

2.2 Deviations from Corrective Action Plan as Approved

The NDEP-approved CAP (NNSA/NSO, 2004b) was modified during field activities to adjust to unexpected conditions and simplify activities. The following deviation occurred from the approved scope of work as presented in the approved CAP (NNSA/NSO, 2004b). Two approved Record of Technical Changes (ROTCs) to the CAP were issued and are included in Appendix G.

2.2.1 Record of Technical Change Number CAP-1

This ROTC approved securing the bunker doors with locks rather than welded them closed as originally stated in the CAP (NNSA/NSO, 2004b) to preserves the historical integrity of the bunkers. In addition, at CAS 05-33-01, Kay Blockhouse, this ROTC approved closing in place the two steel-lined pits, fencing the entrance to the bunker, and erecting a T-post and wire rope fence around the entire bunker.

2.2.2 Record of Technical Change Number CAP-2

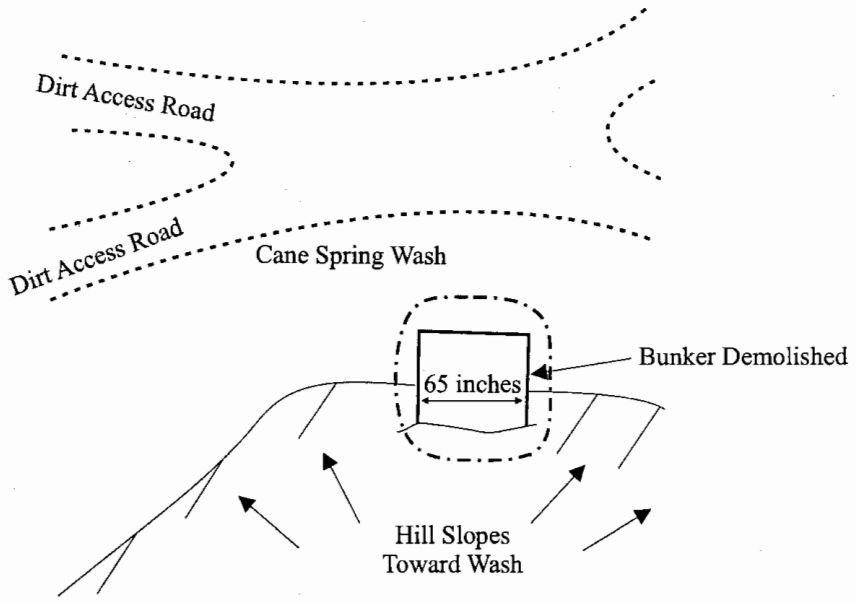
This ROTC approved the use of the revised radiological PALs as clean up criteria, and altered the analysis to be performed on the CAS 05-33-01 verification soil samples. In addition, this ROTC approved closing the two steel-lined pits at CAS 05-33-01 by backfilling with native soil and capping with 1.5 feet of concrete rather than welding steel plates over the pits. .

2.3 Corrective Action Schedule as Completed

The corrective action field activities began in July 2005 and were completed in August 2005. The schedule of closure field activities is provided in Table 1.

2.4 Site Plan/Survey Plat

CAS 01-34-01, CAS 02-34-01, CAS 03-34-01, CAS 05-18-02, and CAS 05-33-01 were Closed in Place with Administrative controls (i.e., URs). The locations of the surveyed points delineating the UR areas are provided in Figures 2 through 6 and in Appendix D, Use Restriction Information.



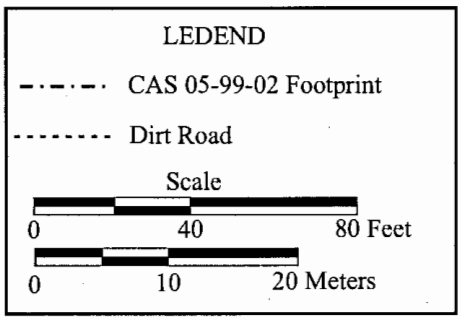


FIGURE 8
CAS 05-99-02 EXPLOSIVE STORAGE BUNKER

TABLE 1 CAU 204 FIELD ACTIVITIES SCHEDULE

CAS[a]	CAS DESCRIPTION	CAS LOCATION[b]	MOBILIZATION	DEMOBILIZATION
01-34-01	Underground Inst. House Bunker	Area 1	03 August 2005	03 August 2005
02-34-01	Instrument Bunker	Area 2	03 August 2005	03 August 2005
03-34-01	Underground Bunker	Area 3	09 August 2005	09 August 2005
05-18-02	Chemical Explosives Storage	Area 5	26 July 2005	03 August 2005
05-33-01	Kay Blockhouse	Area 5	18 July 2005	31 August 2005
05-99-02	Explosives Storage Bunker	Area 5	27 July 2005	27 July 2005

[a] CAS = Corrective Action Site
[b] See Figure 1 for CAS location

3.0 WASTE DISPOSITION

This section describes the waste generated during CAU 204 closure activities and its final disposition. All waste was managed according to state and federal regulations, U.S. Department of Energy (DOE) orders, and BN procedures.

3.1 WASTE MINIMIZATION

Industry standard waste minimization practices were applied throughout the course of field activities. These practices included:

- Using portable x-ray fluorescence unit to field screen for lead contamination. This allowed for a better delineation of the extent of lead-impacted soil.
- Using laboratory analysis and, *In-Situ Object Counting System* to correctly characterize and classify waste streams.

3.2 CONTAINER MANAGEMENT

All waste was managed according to applicable state and federal regulations, DOE orders, the CAU 204 CAP (NNSA/NSO, 2004b), BN Waste Management procedures, and BN company directives.

End-dumps were used to transport sanitary waste to the NTS Area 9 U10c Landfill. Asbestos was removed from burn pits at CAS 05-33-01, Kay Blockhouse, and disposed at the NTS Area 23 Sanitary Landfill. One B-25 box and four soft-sided containers were used for the lead-impacted and LLW-impacted soil from CAS 05-33-01, Kay Blockhouse respectively. The waste was packaged in to appropriate containers and transported to the NTS Area 9 U10c Landfill for disposal. Waste disposition documentation is included in Appendix C. The CAS 05-99-02, Explosive Storage Bunker, was demolished and all debris transported to the NTS Area 9 U10c Landfill.

All waste containers were inspected and approved by BN personnel prior to use. Appropriate labels were affixed and relevant information was marked on the containers with an indelible marker. All information was legible and clearly visible.

3.3 WASTE CHARACTERIZATION

Waste streams were characterized according to the CAU 204 CAP (NNSA/NSO, 2004b) and BN procedures. Samples were collected from each waste stream and shipped to an offsite laboratory for analysis. Waste characterization samples collected for CAU 204 waste streams are listed in Table 2.

3.4 WASTE STREAMS AND DISPOSAL

Waste streams generated during closure activities at CAU 204 included sanitary waste and asbestos waste. Waste disposition documentation is included in Appendix C.

TABLE 2. CAU 204 WASTE CHARACTERIZATION SAMPLES COLLECTED

Sample Number	Date Collected	LOCATION	Parameter Analyzed									Disposal Site
			TCLP Metals[a]	TCLP VOCs[b]	TCLP SVOCs[c]	Paint Filter	pH	Gamma Spectroscopy	Strontium	Isotopic Plutonium	Isotopic Uranium	
CAS[d] 05-33-01, Kay Blockhouse												
			SDG[h] V2514					SDG V2515				
WC05020402	7/25/2005	B25 Box Lead Impacted Soil[g]	X[e]	X	X	X	X	--[f]	--	--	--	NTS Area 9 U10c Landfill
WC05020402	7/25/2005	Soft-Sided Container LLW Soil[g]	--	--	--	--	--	X	X	X	X	NTS Area 9 U10c Landfill
WC05020403			--	--	--	--	--	X	X	X	X	
WC05020404			--	--	--	--	--	X	X	X	X	
WC05020405			--	--	--	--	--	X	X	X	X	
WC05020406			--	--	--	--	--	X	X	X	X	

[a] TCLP Metals = Toxicity Characterization Leaching Procedure Resource Conservation and Recovery Act metals - arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver

[b] TCLP VOCs = Toxicity Characterization Leaching Procedure volatile organic compounds

[c] TCLP SVOCs = Toxicity Characterization Leaching Procedure semi-volatile organic compounds

[d] CAS = Corrective Action Site

[e] X = parameter analyzed for in sample

[f] -- = parameter not analyzed for in sample

[g] = See Section 3.4.1 for disposal of waste

[h] SDG = Sample Delivery Group - Used to identify a group of samples submitted for analysis. Data packages are maintained in project files.

3.4.1 Sanitary Waste

Approximately 3 m^3 (4 yd^3) of suspected lead-impacted soil and 21 m^3 (28 yd^3) of suspected LLW soil were generated during closure activities at CAS 05-33-01, Kay Blockhouse. Waste classification samples were collected and shipped to offsite laboratories for analysis. Analytical results indicated that all COCs were below applicable landfill acceptance and regulatory levels. Based on the analytical results, waste was transported and disposed at the NTS Area 9 U10c Landfill. An end-dump truck was used to transport miscellaneous sanitary waste to the Area 9 U10c Landfill.

3.4.2 Asbestos

Approximately 4 m^3 (5 yd^3) of asbestos was generated during closure activities at CAS 05-33-01, Kay Blockhouse. The waste was transported and disposed at the NTS Area 23 Sanitary Landfill.

4.0 CLOSURE VERIFICATION RESULTS

To verify that CAU 204 closure activities met clean-up criteria, 18 soil verification samples were collected and analyzed at CAS 05-33-01, Kay Blockhouse. Figure 7 shows the verification sample locations. Closure in Place with Administrative Controls was accomplished at CAS 05-33-01 by removing and disposing approximately 3 m^3 (4 yd^3) of suspected lead-impacted soil and 21 m^3 (28 yd^3) of suspected radiologically-impacted soil. The verification samples were analyzed for lead and radiological isotopes. The analytical results showed no COCs remained at concentrations above PALs. Sample results are shown in Table 3, and the laboratory data report is included in Appendix B.

TABLE 3. CAU 204 VERIFICATION SAMPLE RESULTS

SAMPLE NUMBER	DATE COLLECTED	TOTAL LEAD[a] (mg/kg[b])	ISOTOPIC URANIUM[c] (pCi/g[d])	GAMMA SPECTROSCOPY[e] (pCi/g[d])
CAS 05-33-01 Kay Blockhouse		**SDG[f] V2516**	**SDG[f] V2518**	**SDG[f] V2518**
053301-R1	7/21/05	--[g]	--[g]	**<PALs[h]**
053301-R2	7/21/05	--[g]	--[g]	**<PALs[h]**
053301-R3	7/21/05	--[g]	--[g]	**<PALs[h]**
053301-R4	7/21/05	--[g]	--[g]	**<PALs[h]**
053301-R5	7/21/05	--[g]	--[g]	**<PALs[h]**
053301-R6 (Duplicate of R1)	7/21/05	--[g]	--[g]	**<PALs[h]**
053301-RU1	7/21/05	--[g]	**<PALs[h]**	--[g]
053301-RU2	7/21/05	--[g]	**<PALs[h]**	--[g]
053301-RU3	7/21/05	--[g]	**<PALs[h]**	--[g]
053301-RU4	7/21/05	--[g]	**<PALs[h]**	--[g]
053301-RU5	7/21/05	--[g]	**<PALs[h]**	--[g]
053301-RU6 (Duplicate of RU1)	7/21/05	--[g]	**<PALs[h]**	--[g]
053301-VL1	7/25/05	9.2	--[g]	--[g]
053301-VL2	7/25/05	11.4	--[g]	--[g]
053301-VL3	7/25/05	8.1	--[g]	--[g]
053301-VL4	7/25/05	8.3	--[g]	--[g]
053301-VL5	7/25/05	4.8	--[g]	--[g]
053301-VL6 (Duplicate of VL3)	7/25/05	13.9	--[g]	--[g]

[a] Lead analysis by EPA method 6010B (EPA, 1996).
[b] mg/kg = milligrams per kilogram
[c] Isotopic uranium analysis by method HASL-300 (U. S. Department of Energy, 1997).
[d] pCi/g = picoCuries per gram
[e] Gamma Spectroscopy analysis by U.S. Environmental Protection Agency (EPA) method 901.1 (EPA, 1996)
[f] SDG = Sample Delivery Group (used to identify a group of samples submitted for analysis)
[g] - - = Analysis not required
[h] PAL = Preliminary Action Level

4.1 DATA QUALITY ASSESSMENT

Accurate and defensible analytical data were collected to verify that closure criteria were met and that waste was properly characterized, managed, and disposed during CAU 204 closure activities. The following sections describe the quality assurance (QA) / quality control (QC) procedures, data validation process, and a reconciliation of the CSM with actual findings during CAU 204 closure activities.

4.1.1 Quality Assurance/Quality Control Procedures

Verification and waste classification samples were collected with disposable polyethylene scoops, placed in appropriately labeled sample containers, and secured with custody seals. All samples were labeled with a unique sample number, placed on ice in coolers, and transported under a chain-of-custody. Standard QA/QC samples were collected (i.e., collecting one field duplicate per set of 20 or fewer verification samples). Samples were analyzed by contract laboratories. Analytical results were validated at the laboratory using stringent QA/QC procedures. This included matrix spike/matrix spike duplicate, spiked surrogate percent recovery, verification, validation of analytical results, and affirmation of Data Quality Indicator requirements related to laboratory analysis. Detailed information regarding the QA program can be found in the Industrial Sites QAPP (NNSA/NV, 2002b).

4.1.2 Data Validation

Data validation was performed according to the Industrial Sites QAPP (NNSA/NV, 2002b), which is based on the EPA functional guidelines for data quality (EPA, 1994 and 1999). Data were reviewed to ensure that samples were appropriately processed and analyzed, and that the results of the sample analyses are valid. All sample data were internally validated by qualified BN personnel using Tier I and the majority of elements that comprise Tier II. No anomalies were discovered in the data that would discredit any of the waste classification or verification samples from CAU 204. Summaries of laboratory results for all verification samples are included in Appendix B of this document. Complete data sets and verification reports for all verification samples and waste classification samples are maintained in the BN Environmental Restoration project files.

4.1.3 Conceptual Site Models

Three CSMs were developed for CAU 204 in the CAIP (NNSA/NV, 2002a).

The first CSM, *Interior Bunker Release*, applied to all of the CASs in CAU 204. The potentially affected media are concrete inside and outside the bunkers, and the surface and subsurface soils outside the bunkers adjacent to exterior doors and ventilation exit points. This CSM predicts that the concentration of the contaminants would be the highest in the immediate vicinity of a release to the environment, and would decrease with distance (both horizontally and vertically) from the release. Even if a release occurred within the bunker, migration to the environment did not necessarily occur, and thus sampling of media outside of the bunker may not be necessary. No variations to the CSM were identified, and investigation results are presented in the CADD (NNSA/NSO, 2004a). During closure activities, No Further Action was required at CAS 05-99-02. The remaining CASs were Closed in Place with Administrative Controls.

The second CSM, *Surface Debris/Burn Area*, applied to CAS 05-18-02, Chemical Explosives Storage; CAS 05-33-01, Kay Blockhouse; and CAS 05-99-02, Explosive Storage Bunker. Depending upon site conditions, this CSM may apply to CAS 01-34-01, Underground Inst. House Bunker; CAS 02-34-01, Instrument Bunker; and CAS 03-34-02, Underground Bunker. The potentially affected media are surface and subsurface soils. This CSM predicts that contamination originating above the ground or at the ground surface may exist due to activities that occurred at the sites. This CSM includes burn areas or areas where materials/wastes may have been stored, disposed of, burned, or otherwise impacted soil at the ground surface. Contaminants may have been released due to these activities, which would have caused contamination originating at the surface. No variations to the CSM were identified and investigation results are presented in the CADD (NNSA/NSO, 2004a). During closure activities, No Further Action was required at the CAS 05-99-02. The remaining CASs were Closed in Place with Administrative Controls.

The third CSM, *Subsurface Debris/Burn Area*, applied to CAS 05-33-01, Kay Blockhouse. The potentially affected media are subsurface soils. This CSM predicts that subsurface contamination may exist due to activities that occurred in the shallow subsurface at the site. This CSM includes burn areas or areas where materials/wastes may have been stored, disposed of, burned, or otherwise impacted subsurface soil at the site. Concentration of contaminants would be highest in the immediate vicinity and directly below the disturbed soil location. If a release occurred under this CSM, the location most likely to be contaminated would be at the soil interface directly below the release. No variations to the CSM were identified, and the CSM was confirmed by soil sample results presented in the CADD (NNSA/NSO, 2004a) and verified during closure activities.

4.2 USE RESTRICTION

The following CASs have been closed in place with administrative controls and UR implemented:

- CAS 01-34-01, Underground Inst. House Bunker
- CAS 02-34-01, Instrument Bunker
- CAS 03-34-01, Underground Bunker
- CAS 05-18-02, Chemical Explosives Storage
- CAS 05-33-01, Kay Blockhouse

The future use of any land related to the above CASs is restricted from any activity that may alter or modify the containment controls as approved by the NDEP, unless appropriate concurrence is obtained in advance. The CAU Use Restriction Information forms and figures for these sites are included in Appendix D. Details on the post-closure requirements are included in Section 5.2.

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5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The following site closure activities were performed at CAU 204 and are documented in this CR.

CAS 01-34-01, Underground Inst. House Bunker: The site was closed in place with administrative controls. All entrances to the bunker were secured, and UR warning signs were posted to address interior contamination. Annual site inspections will be conducted at this CAS.

CAS 02-34-01, Instrument Bunker: The site was closed in place with administrative controls. The entrances to the bunker were closed and secured with locks to restrict access. UR warning signs were posted to address interior contamination and warn against intrusive activity. Annual site inspections will be conducted at this CAS.

CAS 03-34-01, Underground Bunker: The site was closed in place with administrative controls. All entrances to the bunker were secured and UR warning signs were posted to address interior contamination and warn against intrusive activity. Annual site inspections will be conducted at this CAS.

CAS 05-18-02, Chemical Explosives Storage: The site was closed in place with administrative controls. Both bunkers were closed and secured with locks. UR warning signs were posted to address interior bunkers contamination and warn against intrusive activity. RMA boundaries were expanded after conducting radiological surveys, and appropriate radiological warning signs were posted for the expanded RMA boundaries. Annual site inspections will be conducted at this CAS.

CAS 05-33-01, Kay Blockhouse: The site was closed in place with administrative controls. Suspected lead- and radiologically-impacted soil was excavated, classified, and disposed. Asbestos was removed from a burn pit and disposed. The bunker was secured by installing a gate and fence around the bunker. The fence was extended to the CAS boundary. Asbestos insulation was left in place in two steel-lined pits and the void space backfilled with native fill and 1.5 feet of concrete. UR warning signs were posted to address contamination and warn against intrusive activity. Annual site inspections will be conducted at this CAS.

CAS 05-99-02, Explosive Storage Bunker: No further action was performed at this CAS. As a BMP, the bunker was demolished and all debris removed and disposed as sanitary waste.

5.2 POST-CLOSURE REQUIREMENTS

Details of the CAU 204 post-closure requirements are provided below.

5.2.1 Inspections

Inspections will be performed annually at each site with active URs. These include:

- CAS 01-34-01, Underground Inst. House Bunker

- CAS 02-34-01, Instrument Bunker
- CAS 03-34-01, Underground Bunker
- CAS 05-18-02, Chemical Explosives Storage
- CAS 05-33-01, Kay Blockhouse

Inspections will consist of visual observations to verify that any fencing is in good repair, the proper signs are in place and readable, and the UR is maintained. The results of the inspection will be documented in the annual NTS Post-Closure Letter Report. The letter report will include a brief discussion of observations and inspections and copies of the site inspection checklists. A copy of each annual letter report will be submitted to the NDEP.

If any maintenance and repair requirements are identified during the annual site inspections, funding will be requested and the repairs scheduled. Any repair or maintenance performed at these sites shall be documented in writing at the time of the repair and included in the annual letter report.

In addition to annual post-closure inspections, CAS 05-18-02 and CAS 05-33-01 are currently posted as RMAs. As part of the NTS Radiological Control Demarcation and Maintenance program, sites posted as RMAs are inspected and resurveyed to verify the site postings once every four years. Demarcation and Maintenance personnel will perform a radiological survey of the RMA boundaries, perform any needed maintenance on the existing radiological postings, and, if needed, update the radiological site postings. Results of all radiological surveys will be maintained in the project files.

5.3 RECOMMENDATIONS

Since closure activities for CAU 204 have been completed following the NDEP-approved CAP (NNSA/NSO, 2004b) as documented in this report and deviations provided in Section 2.2, NNSA/NSO requests the following:

1. A Notice of Completion provided by the NDEP to the NNSA/NSO for the closure of CAU 204.

2. The transfer of CAU 204 from Appendix III to Appendix IV, *Closed Corrective Action Units,* of the FFACO (FFACO, 1996).

6.0 REFERENCES

EPA, see U.S. Environmental Protection Agency.

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.

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U.S. Department of Energy. 1997. Environmental Measurements Laboratory Procedure Manual, HASL-300. Washington, D.C.

U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office. 2002a. Corrective Action Investigation Plan for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada. DOE/NV--866, REV. 0, Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office. 2002b. Nevada Environmental Restoration Project Industrial Sites Quality Assurance Project Plan, Nevada Test Site, Nevada. DOE/NV--372, REV. 3, Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004a. Corrective Action Decision Document for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada, DOE/NV--959, REV. 0, Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004b. Corrective Action Plan for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada. DOE/NV--1003, REV. 0, Las Vegas, NV.

U.S. Environmental Protection Agency. 1994. Guidance for the Data Quality Objectives Process, EPA QA/G-4. Washington D.C.

U.S. Environmental Protection Agency. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-0846 CD ROM PB97-501928GEI, which contains updates for 1986, 1992, 1994, and 1996. Washington D.C.

U.S. Environmental Protection Agency. 1999. Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA540/R-99/008. Washington D.C.

REFERENCES (continued)

U.S. Environmental Protection Agency. 2002. Region 9 Preliminary Remediation Goals, October 1, San Francisco, CA.

APPENDIX A.

DATA QUALITY OBJECTIVES

As presented and published in the approved Corrective Action Investigation Plan for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada, 2002, DOE/NV--866. Las Vegas, NV.

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Appendix A.1

Data Quality Objectives

A.1 Seven-Step DQO Process for CAU 204 Investigations

The DQO process is a strategic planning approach based on the scientific method that is used to prepare for site characterization data collection. The DQOs are designed to ensure that the data collected will provide sufficient and reliable information to identify, evaluate, and technically defend the recommendation of viable corrective actions (e.g., no further action or close in place). The DQO process is a seven-step process as follows:

- State the problem.
- Identify the decision.
- Identify the inputs to the decision.
- Define the boundaries of the study.
- Develop a decision rule.
- Specify tolerable limits on decision errors.
- Optimize the design for obtaining data.

The CAU 204 DQOs were developed using this seven-step process, and each step is discussed in detail in this appendix.

Background Information on CAU 204

Corrective Action Unit 204 is comprised of the following CASs:

- 01-34-01, Underground Instrument House Bunker
- 02-34-01, Instrument Bunker
- 03-34-01, Underground Bunker
- 05-18-02, Chemical Explosives Storage
- 05-33-01, Kay Blockhouse
- 05-99-02, Explosives Storage Bunker

Corrective Action Sites 01-34-01, 02-34-01, and 03-34-01 are in areas associated with the T-1, T-2, and T-3 atmospheric nuclear test series, respectively. Widespread radiological contamination is expected at the three sites as a result of these atmospheric tests. Because of this, the investigation of radiological contamination associated with these tests will be limited to the interior of the bunkers. Exterior radiological contamination due to these tests will not be addressed in this investigation because exterior contamination associated with atmospheric testing will be addressed by the Soils

Project. However, any radiological contamination encountered during the investigation that is not related to atmospheric tests will be included in the CAU 204 investigation.

According to historical documentation and interviews, all of the CAU 204 sites are classified as magazine/bunkers. At CASs 05-18-02 and 05-33-01, the sites include areas near the bunker where other activities were conducted or are identified as related to the bunkers themselves. The following text is provided as background information for the sites in CAU 204. Additional background information is presented in the CAIP.

CAS 01-34-01, Underground Instrument House Bunker; CAS 02-34-01, Instrument Bunker; and CAS 03-34-01, Underground Bunker

These three CASs are all similar in construction, purpose, and use. The bunkers have soil and asphalt roofs and a concrete walkway leading to the bunkers. The three bunkers were instrumentation locations for the T-1, T-2, and T-3 atmospheric test series, respectively. Each of the bunkers are located approximately 3,000 ft from the zero point for their respective atmospheric tests.

CAS 05-18-02, Chemical Explosives Storage

This CAS is a bunker location commonly referred to as Sugar Bunker. The site consists of the Sugar Bunker and attached small bunker, and two cellar units. This bunker was the location of a series of tests using HE. The location was also the primary control station for the Diluted Waters underground test, which was a line-of-sight, hydrodynamic test.

CAS 05-33-01, Kay Blockhouse

The main feature of the Kay Blockhouse CAS is a bunker. However, the site also includes a surrounding area where activities associated with non-nuclear explosives tests were conducted. The site consists of a bunker, a wood and steel structure near the bunker, insulated piping and debris, two open pits, two burn pits with steel frames, a burn pit with soil berm, two steel-lined burn pits, one berm and piping, an underground structure and berm with piping debris, and a burn area and open pit located near the western edge of the site. It is not clear whether the Kay Blockhouse has a concrete floor or a wooden floor.

CAS 05-99-02, Explosive Storage Bunker

This location was used only as an explosives storage bunker and is commonly referred to as Bunker 803. A review of historical documentation indicates that this bunker has a dirt floor. Historical documentation is limited; however, information indicates that this bunker was used in approximately 1992 during the "Helicopter Program" by WSI. No historical information was found regarding the Helicopter Program. A wooden box that apparently contained explosives or ordnance is presently just inside the door of the bunker. The box appears to be filled with soil; however, the presence of explosives or ordnance below the soil cannot be ruled out.

A.1.1 Step 1 - State the Problem

Step 1 defines the problem that has initiated the CAU 204 site investigation. This step identifies the DQO planning team members, describes the problem, and develops a CSM.

A.1.1.1 Planning Team Members

The DQO planning team consists of representatives from NDEP, NNSA/NV, ITLV, and Bechtel Nevada (BN). The primary decision-makers include NDEP and NNSA/NV representatives. Table A.1-1 lists representatives from each organization in attendance at the August 13, 2002, DQO meeting.

A.1.1.2 Describe the Problem

Corrective Action Unit 204 is being investigated because:

- The CASs are abandoned sites that were not properly closed and may not comply with the requirements of future land use.
- Hazardous and/or radioactive constituents may be present at concentrations and locations that could potentially pose a threat to human health and the environment.
- Disposed waste may be present without appropriate controls (i.e., use restrictions).

The problem statement for CAU 204 is: "Existing information on the nature and extent of potential contamination is insufficient to evaluate and recommend corrective action alternatives for the six CASs."

Table A.1-1
DQO Meeting Participants

Participant	Affiliation
Sean Kosinski	NNSA/NV
Clem Goewert	NDEP
Dan Tobiason	BN
Allison Urbon	BN
R. Lynn Kidman	ITLV
Robert Sobocinski	ITLV
Jill Dale	ITLV
Thomas Thiele	ITLV
Dave Schrock	ITLV
Barbara Quinn	ITLV
Stacey Alderson	ITLV
Joe Hutchinson	ITLV
Jack Ellis	ITLV
Jeanne Wightman	ITLV
Steve Ward	ITLV

BN – Bechtel Nevada
ITLV – IT Corporation, Las Vegas Office
NDEP – Nevada Division of Environmental Protection
NNSA/NV – DOE, National Nuclear Security Administration Nevada Operations Office

A.1.1.3 Develop Conceptual Site Model

The CSM describes the most probable scenario for current conditions at a site and defines the assumptions that are the basis for identifying appropriate sampling strategy and data collection methods. An accurate CSM is important as it serves as the basis for all subsequent inputs and decisions throughout the DQO process.

If additional elements are identified during the investigation that are outside of the scope of the CSMs as presented in this section, the situation will be reviewed and a recommendation will be made to revise the DQOs. If this occurs, NDEP will be notified and given the opportunity to comment on, or concur with, the recommendation.

A.1.1.3.1 Conceptual Site Models for CAU 204

An important element of a CSM is the expected fate and transport of contaminants, which describe how contaminants move through site media and where they can be expected in the environment. The expected fate and transport is based on distinguishing physical characteristics of the contaminants and media. Contaminant characteristics include solubility, density, and affinity for nonmobile particles. Media characteristics include permeability, porosity, hydraulic conductivity, composition, and degree of saturation. In general, contaminants with low solubility, high density, and high affinity can be expected to be found relatively close to release points. Contaminants with high solubility, low density, and low affinity can be expected to be found further from release points or in areas where settling may occur. Vapor phase diffusion is limited by the vapor pressure of the contaminant and is expected to be confined to relatively short distances from the contaminant source. Contaminant migration at the NTS that is controlled by these factors would result in contaminant concentrations that decrease with distance from the contaminant source.

Three CSMs have been developed for the six CASs at CAU 204 using historical background information, knowledge from studies at similar sites, and data from previous sampling efforts. The CSMs are termed Interior Bunker Release (CSM #1), Surface Debris/Burn Area (CSM #2), and Subsurface Debris/Burn Area (CSM #3). The applicability of the CSMs to each CAS is summarized in Table A.1-2. As shown in Table A.1-2, contaminant release and exposure at CAS 05-33-01 is covered by all of the CSMs; a single CSM will only cover a portion of the CAS. The CSMs are discussed in the following sections and depicted in Figures A.1-1, A.1-2, and A.1-3.

Table A.1-2
CSMs and Associated CASs

Conceptual Site Model (CSM)	01-34-01	02-34-01	03-34-01	05-18-02	05-33-01	05-99-02
Interior Bunker Release (#1)	X	X	X	X	X	
Surface Debris/Burn Area (#2)	X[a]	X[a]	X[a]	X	X	X
Subsurface Debris/Burn Area (#3)					X	

X - The CSM applies to this CAS.
X[a] - The CSM may apply to this CAS, depending upon site conditions.

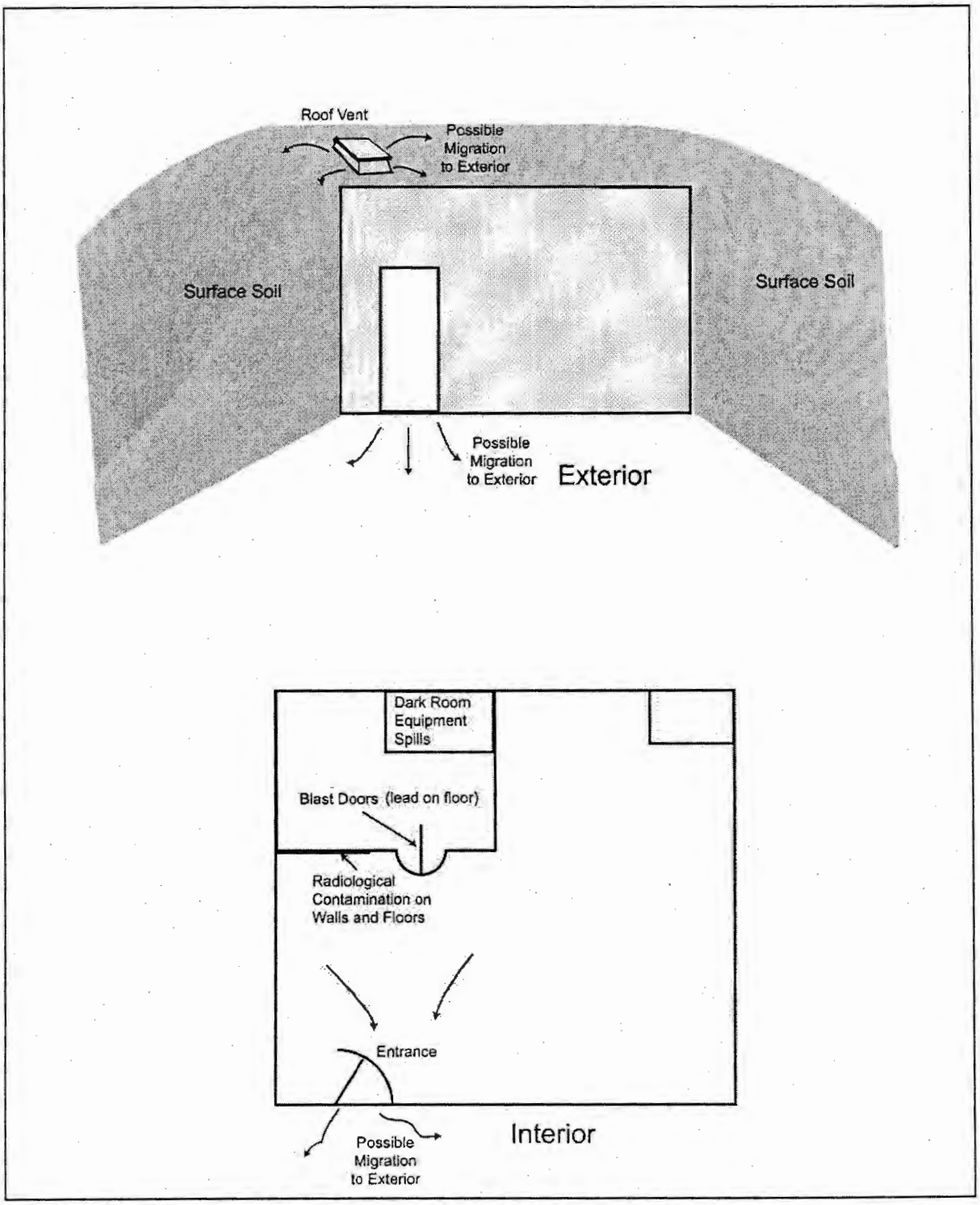

Figure A.1-1
CAU 204, Conceptual Site Model #1,
Bunker Interiors and Potential Migration

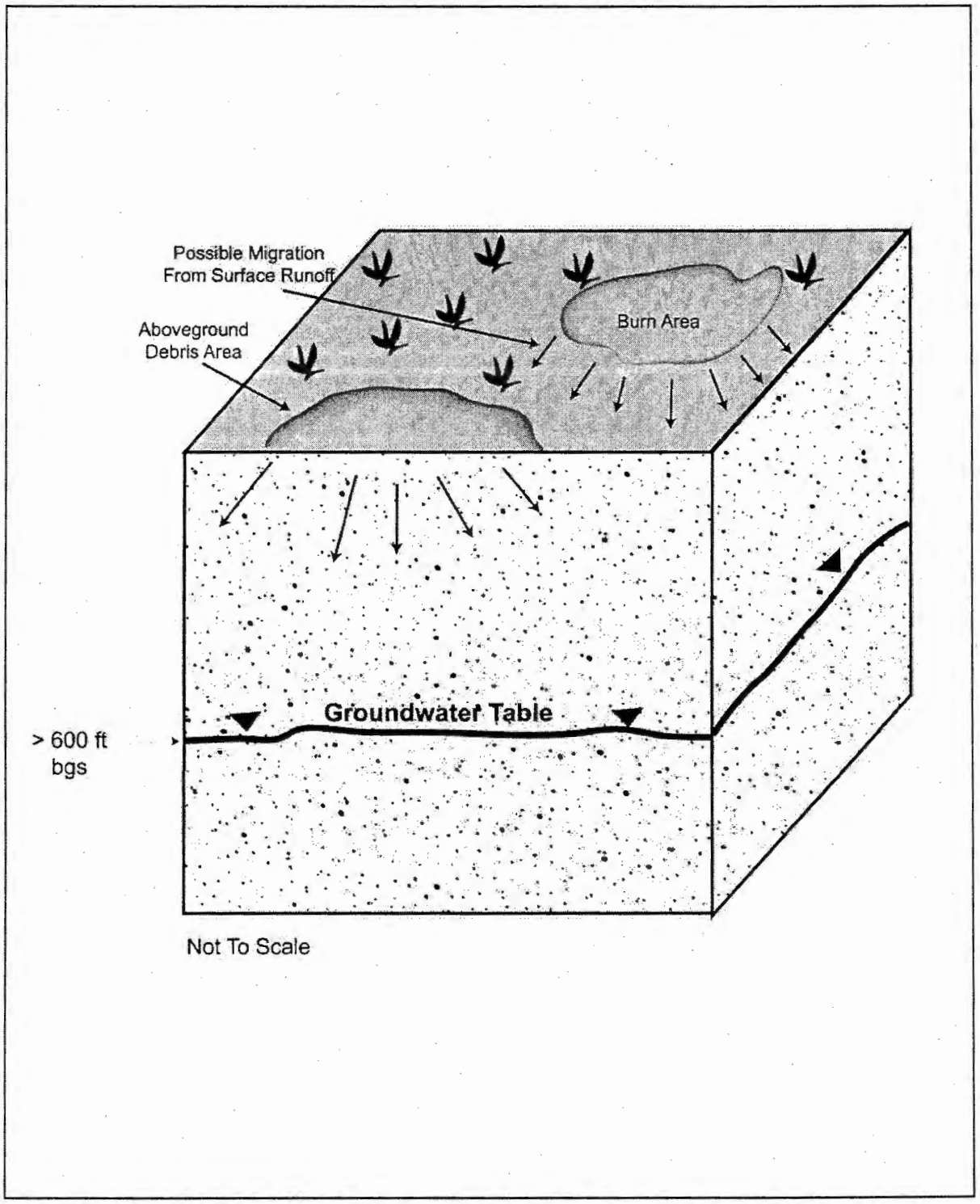

Figure A.1-2
CAU 204, Conceptual Site Model #2,
Surface Debris/Burn Area

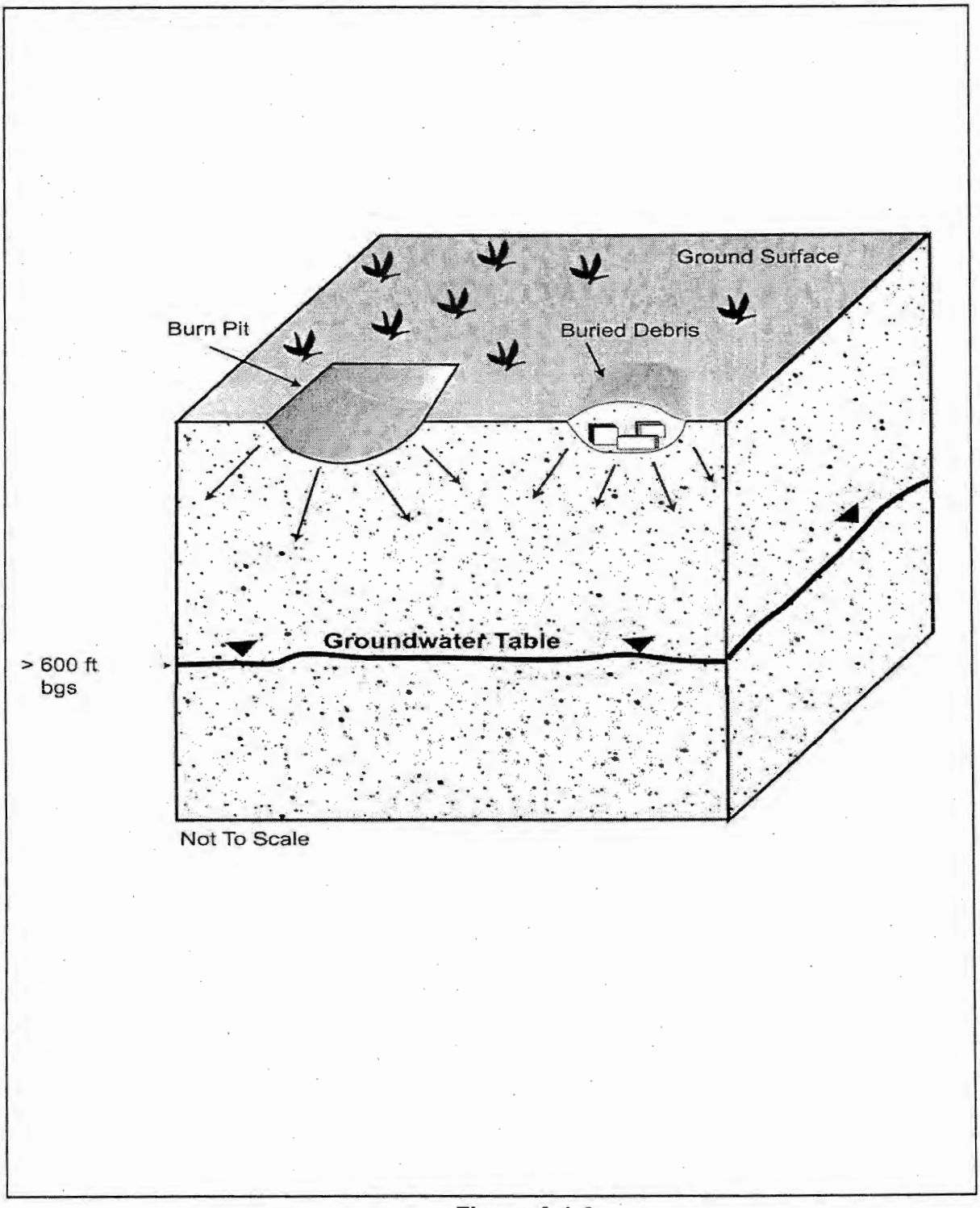

Figure A.1-3
CAU 204, Conceptual Site Model #3,
Subsurface Debris/Burn Area

A review of historical documentation indicates that there was possible storage and/or release of explosives, petroleum hydrocarbons, and hazardous and/or radiological materials at CAU 204 locations. Based upon these CSMs, contamination would be attributable to a release to the interior of the bunkers, or to the surface or subsurface soils. The interiors of all bunkers/structures have concrete floors and walls with the exception of CAS 05-99-02, which has a dirt floor, and CAS 05-33-01 which may have a wooden floor.

Interior Bunker Release Conceptual Site Model (CSM #1)

Figure A.1-1 shows a generalized representation of CSM #1. Instrumentation and equipment used for various tests and/or climate control systems were present at one time in the interior at these CASs. If a liquid spill or release occurred within one of these bunkers, the liquid-containing potential contaminants may have migrated through the doors of the structure. Contaminants may have penetrated the surface of the concrete, especially if cracks were present within the area impacted by the release. However, any penetration of the concrete would be minor, and it is highly unlikely that contamination would have reached the underlying soil. Lateral migration within the bunker is possible; however, based upon the bunker design, migration to the environment is improbable. Vertical migration is unlikely due to the practically impermeable concrete floor of the bunkers, unless a significant release occurred and the release was able to migrate beyond the exterior door of the bunker, or the release was in an area of substantial cracking in the concrete floor. Thus, even though a release may have occurred within the bunker, it is highly unlikely that the release migrated to the outside environment. In addition, there is no evidence that large volumes of materials capable of migration were ever used in the bunkers.

If an airborne release occurred within a bunker, the airborne contaminants may have migrated to the environment through the exterior door or ventilation system of the bunker. If this occurred, airborne contaminants could be deposited on the surfaces within the ventilation system, and possibly on the ground surface outside the doors and/or vents. It would be expected that contaminant levels decrease with distance from the bunker.

This CSM predicts that the concentration of the contaminants would be highest in the immediate vicinity of a release to the environment, and would decrease with distance (both horizontally and vertically) from the release. It should be noted that even if a release occurred within the bunker,

migration to the environment did not necessarily occur, and thus sampling of media outside of the bunker may not be necessary. The decision to sample media outside of the bunker will be based upon biasing factors within the bunker and the results of interior bunker samples that may be required to confirm a release. Additionally, as discussed previously, any exterior contamination caused by the atmospheric nuclear tests for which CASs 01-34-01, 02-34-01, and 03-34-01 were constructed is outside of the scope of this investigation and no sampling outside of the bunker will be specifically performed to verify contamination due to these tests. Contamination within the bunker attributable to these tests will be quantified, as described in Section A.1.4.

Surface Debris/Burn Area Conceptual Site Model (CSM #2)

This CSM predicts that contamination originating above the ground or at the ground surface may exist due to activities that occurred at the sites. CSM #2 is depicted in Figure A.1-2.

This CSM includes burn areas or areas where materials/wastes may have been stored, disposed of, burned, or otherwise impacted soil at the ground surface. Contaminants may have been released due to these activities, which would have caused contamination originating at the surface. These areas are specific locations within the CAS that were identified based upon process knowledge and site visits. Contaminants would be expected to migrate away from the release point, primarily downward, and to a lesser degree horizontally, although runoff may have occurred prior to infiltration into the surface soil. This CSM predicts that the concentration of contaminants would be highest in the immediate vicinity and directly below the surface release location, and would decrease with distance, both horizontally and vertically. If friable asbestos or ACMs are present, the asbestos could become airborne if disturbed.

Subsurface Debris/Burn Area Conceptual Site Model (CSM #3)

This CSM predicts that subsurface contamination may exist due to activities that occurred in the shallow subsurface at the site. CSM #3 is depicted in Figure A.1-3. This CSM includes burn areas or areas where materials/wastes may have been stored, disposed of, burned, or otherwise impacted subsurface soil at the site. Contaminants may have been released due to these activities, which would have caused contamination originating below the ground surface. These areas are specific locations within the CAS that were identified based upon process knowledge and site visits. Contaminants would be expected to migrate away from the release point, primarily downward, and to a lesser

degree horizontally. This CSM predicts that the concentration of contaminants would be highest in the immediate vicinity and directly below the disturbed soil location. If a release occurred under this CSM, the location most likely to be contaminated would be at the soil interface directly below the release. If friable asbestos or ACMs are present, the asbestos could become airborne if disturbed.

The following sections provide additional information on CSMs #1, 2, and 3.

Future Land-Use Scenarios

Future land-use scenarios limit future uses of the CASs to various nonresidential (i.e., industrial) uses (DOE/NV, 1998). The future land-use scenarios for CAU 204 are presented in Table A.1-3.

Table A.1-3
Future Land-Use Scenarios for CASs Within CAU 204

CAS	Land Use Zone	Zone Description
01-34-01 02-34-01 03-34-01	Nuclear and High Explosives Test	This area is designated within the Nuclear Test Zone for additional underground nuclear weapons tests and outdoor high explosive tests. This zone includes compatible defense and nondefense research, development, and testing activities. (DOE/NV, 1998)
05-18-02 05-33-01 05-99-02	Reserved (within NTS)	This area includes land and facilities that provide widespread flexible support for diverse short-term testing and experimentation. The reserved zone is also used for short duration exercises and training, such as nuclear emergency response and Federal Radiological Monitoring and Assessment Center training and U.S. Department of Defense land-navigation exercises and training. (DOE/NV, 1998)

Exposure scenarios for sites located within the NTS boundaries are limited by the future land-use scenarios to site workers who may be exposed through oral ingestion, inhalation, or dermal contact (absorption) of contaminants associated with soils and/or objects (e.g., debris) due to inadvertent disturbance of these materials. An additional exposure pathway for workers is through external exposure to beta/gamma radiation at sites containing radiological contamination.

Affected Media

For CSM #1, Interior Bunker Release, the potentially affected media are concrete inside and outside the bunkers, and the surface and subsurface soils outside the bunkers, adjacent to exterior doors and ventilation exit points. If contamination is found at any of these points, potential migration to soil

outside the bunker may need to be considered. For CSM #2, Surface Debris/Burn Area, the potentially affected media are surface and subsurface soils. For CSM #3, Subsurface Debris/Burn Area, the potentially affected media are subsurface soils.

Based upon these CSMs, contamination found at the CAU 204 CASs would be attributable to a release to the interior of the bunkers, or to the surface or subsurface soils. Insufficient records are available for many of these areas; therefore, the information related to the COPCs is based upon limited historical documentation, interviews with current/former site employees, and site visits.

Location of Contamination/Release

For CSM #1, any releases to the environment would first occur within the interior of the bunker and then would have had to migrate out of the bunker and into the soil outside the bunker. For airborne contaminants, releases would first be to the air within the bunker and then through the vents or exterior door to the soil outside. Under this scenario, the surface soil adjacent to the vents or door would have been the most likely point of release to the environment. Contamination may also be found in subsurface soils, if sufficient contamination migrated to the exterior of the bunker. If the contaminant migrated to the environment via the vents or door, the contamination will be covered under CSM #2. For CSM #2, the release would have been to surface soils. Therefore, contamination would be expected in the surface and possibly subsurface soils. For CSM #3, the release would have been below the ground surface and, thus, only subsurface contamination is expected. Migration of contamination for all the CSMs would be expected to be primarily downward, with horizontal migration to a lesser extent. For CSMs #1 and #2, some horizontal migration on the ground surface prior to infiltration is possible. For all CSMs, the presence of relatively impermeable layers (e.g., concrete or caliche) may influence both lateral and vertical migration.

Transport Mechanisms

The degree of contaminant migration at these sites is unknown, but it is assumed to be minimal based on impervious surfaces (for CSM #1), low precipitation, and high evapotranspiration rates. Runoff could cause lateral migration of contaminants over the ground surface for both CSMs #1 and #2. Contaminants may also have been transported by infiltration and percolation of precipitation through soil, which would serve as a driving force for downward migration. See "Lateral and Vertical Extent

of Contamination" for additional information. Friable asbestos could become airborne if disturbed, and transported by wind to become an air and surface soil contaminant.

Preferential Pathways

Preferential pathways for contaminant migration are not expected for the CAU 204 CASs. As discussed previously, the presence of relatively impermeable layers could modify transport pathways both on the ground surface (e.g., concrete floors at CSM #1) and in the subsurface (e.g., caliche layers for CSMs #2 and #3). Contamination would travel laterally prior to infiltration, under CSM #1. Under CSMs #2 and #3, contamination may travel laterally, if the contamination encountered an impermeable layer in the subsurface soil. The potential effect of these will be considered in the development of sampling schemes and sampling contingencies discussed in the CAIP.

Lateral and Vertical Extent of Contamination

Contamination, if present, is expected to be confined to the release site. Concentrations of contamination are expected to decrease with distance and depth from the release.

Surface migration may occur as a result of storm events when precipitation rates exceed infiltration rates (stormwater runoff). However, these events are infrequent. Surface migration is a biasing factor considered in the selection of sampling points.

As stated previously, downward contaminant transport is expected to be very limited. Subsurface migration will be influenced by the geophysical properties of the soil, such as permeability, porosity, and conductivity. The vertical migration of contaminants is expected to be limited due to the lack of a driving force (minimal infiltration). Migration of certain constituents (i.e., metals, radionuclides) will also be controlled to varying degrees by geochemical processes, such as adsorption, ion exchange, and precipitation of solids from solution.

Groundwater contamination is not considered a likely scenario at CAU 204, due to the factors described above minimal precipitation, high evapotranspiration, and significant depths to groundwater. For example, well depths in Area 5 are recorded between 887 ft bgs at Well WW-5a to 2,862 ft bgs at UE-5c WW (USGS, 2002).

A.1.1.3.2 Contaminants of Potential Concern and Suspected Contaminants

Contaminants of potential concern are defined as the analytes reported by the analytical program listed in Table A.1-6 that are also listed in the *Region IX Preliminary Remediation Goals* (EPA, 2000), or the IRIS Database (EPA, 2002). Suspected contaminants are defined as the chemicals, substances, or materials identified during a preliminary assessment that can be expected to be present due to activities related to the site. The CAS-specific list of suspected contaminants was developed based on process knowledge of the CASs, review of historic documents, past investigations at related CASs, and interviews with former site employees. Suspected contaminants will be used to assist in the identification of data needs, and are summarized below, with supporting information about how they were developed. As complete information regarding activities performed at these sites as well as throughout the NTS is unavailable, some uncertainty as to the comprehensive list of potential contaminants exists. Due to this uncertainty, constituents (in addition to the suspected contaminants) have been included in the analytical program for the investigation of CAU 204. The analytical program for each CAS is provided in Section A.1.3.3.

CAS 01-34-01, Underground Instrument House Bunker; CAS 02-34-01, Instrument Bunker; and CAS 03-34-01, Underground Bunker

The suspected contaminants at each of these sites are similar. Based upon historical information, the suspected contaminants for these CASs are radionuclides (from the atmospheric tests) americium-241 (Am-241), cesium-137 (Cs-137), cobalt-60 (Co-60), europium-152 (Eu-152), Eu-154, plutonium-238 (Pu-238), Pu 239/240, and strontium-90 (Sr-90). Other suspected contaminants are: lead from bricks, pipes, and doors; PCBs and petroleum hydrocarbons from electrical equipment; and for CAS 02-34-01 only, silver nitrate from photo processing.

CAS 05-18-02, Chemical Explosives Storage

Corrective Action Site 05-18-01 includes a bunker that will be addressed similar to CASs 01-34-01, 02-34-01, and 03-34-01. Radiological-suspected contaminants for this CAS are DU, Am-241, Co-60, Cs-137, Eu-152, Eu-154, Pu-238, Pu-239/240, Sr-90, and U-235. Other suspected contaminants are HE, PCBs, beryllium (Be), hydraulic oil, gasoline, lead, and asbestos.

CAS 05-33-01, Kay Blockhouse

Corrective Action Site 05-33-01, Kay Blockhouse, includes a bunker that will be addressed similar to CASs 01-34-01, 02-34-01, and 03-34-01; however, the site also includes a surrounding area where activities associated with nonnuclear explosives tests were conducted.

This CAS includes suspected contaminants on the surface as well as below grade. Radiological-suspected contaminants associated with this site include DU, Am-241, Co-60, Cs-137, Eu-152, Eu-154, Pu-238, Pu-239/240, Sr-90, and U-235. Other suspected contaminants are Be, HE, acetone, kerosene, hydraulic oil, pyrolytic oil, PCBs, and asbestos.

CAS 05-99-02, Explosive Storage Bunker

The floor of this bunker is dirt and, thus, contamination may have migrated to the surface soils from within the bunker. The suspected contaminants at this site are limited to HE resulting from storage of explosives and application of rodenticide. The only rodenticides identified with action levels are warfarin, an organic compound, and zinc phosphide, an inorganic compound. Of these, only zinc phosphide use is documented for the NTS. No documentation regarding rodenticide use or identification specific to the CAS 05-99-02 bunker was found.

A.1.2 Step 2 - Identify the Decision

This step develops decision statements and defines alternative actions.

A.1.2.1 Develop Decision Statements

The primary problem statement is: "Is sufficient information available to evaluate and recommend corrective action alternatives?" Because existing information at each CAS is insufficient to resolve this problem statement, the following two decision statements have been established as criteria for determining the adequacy of the data collected during the investigation:

- Decision I: "Is the nature of contamination defined?"
- Decision II: "Is the extent of contamination defined?"

A.1.2.2 Alternative Actions to the Decisions

- Decision I: If a COC is not present, further assessment of the CAS is not required.
- Decision II: If a COC is present and its extent is defined in the lateral and vertical directions, further assessment of the CAS is not required. If the extent is not defined, reevaluate site conditions and collect additional samples.

A.1.3 Step 3 - Identify the Inputs to the Decisions

This step identifies the information needed, determines sources for information, determines the basis for establishing the action level, and identifies sampling and analysis methods that can meet the data requirements. To determine if a COC is present (define the nature of the contamination), each sample result is compared to a PAL (Section A.1.3.2). If any sample result is greater than the PAL, the vertical and lateral extent of the contamination is determined via additional sampling. This approach does not use a statistical mean/average for comparison to the PAL, but rather the individual result to identify COCs.

A.1.3.1 Information Needs and Information Sources

In order to determine the nature of a COC at a particular CAS, sample data must be collected and analyzed following these two criteria: (1) samples must be collected in areas most likely to be contaminated (e.g., a stained area or soil immediately beneath debris), and (2) the analytical suite selected must be sufficient to detect any contamination present in the samples.

Biasing factors to support criteria #1 include:

- Documented process knowledge on source and location of release
- Field observations
- Historical sample results
- Geophysical surveys
- Field screening
- Radiological survey results
- Experience and data from investigations of similar sites
- Professional judgement

In order to determine the extent of a COC, samples must be collected from locations to bound the lateral and vertical extent. The data required to satisfy the information need is a sample analytical result from each location that demonstrates that each COC concentration is below the corresponding

PAL. Generally, three lateral step-out samples and one vertical sample will be collected around a location or area where the PAL has been exceeded for one or more COCs. The lateral samples will be located a maximum of 15 ft from the previous location, while the vertical samples will generally begin 2 ft below the depth where COCs have been detected. The lateral step-out distance will generally be based upon the size of the already determined contaminated area. The step-outs for small areas will be just a few feet from the previous contaminated locations; whereas, on large contaminated areas, the step-outs will increase to as much as 15 ft. When indicators or biasing factors indicate that the COC concentration at the step-out location may still exceed the PAL, then an additional step-out distance may be used to collect the analytical sample. If the location where the PAL is exceeded is surrounded by clean locations, then lateral step-outs may not be necessary. In that case, sampling may consist only of sampling from deeper intervals at or near the original location to determine the vertical extent of contamination. Step-out locations may be moved due to access or safety issues; however, the modified locations must meet the decision needs and criteria necessary to fulfill the information needs.

Samples for extent of contamination will only be analyzed for those parameters that exceeded PALs (i.e., COCs) in previous samples. Biasing factors to support selection of extent of contamination sampling locations may include:

- Geophysical and/or radiological surveys
- Documented process knowledge on source and location of release
- Field observations
- Field-screening results
- Historical sample results
- Experience and data from investigations of similar sites
- Professional judgement
- Previous sample results

Table A.1-4 (Decision I) and Table A.1-5 (Decision II) list the information needs, the source of information for each need, and the proposed methods to collect the data. The last column addresses the QA/QC data type and associated metric. The data type is determined by the intended use of the resulting data in decision making. Data types are discussed below.

Table A.1-4
Information Needs to Resolve Decision I
(Page 1 of 3)

Information Need	Information Source	Collection Method	Biasing Factors to Consider	Data Type/Metric
Decision: Define nature of contamination. Criteria 1: Samples will be collected in areas most likely to contain COCs.				
Source and location of release points	Process knowledge compiled during a preliminary assessment and previous investigations of similar sites	Information documented in CSM and public reports – no additional data needed	Not Applicable	Qualitative – CSM has not been shown to be inaccurate
	Field observations	Conduct site visits and document field observations	Visible evidence of release	Qualitative – CSM has not been shown to be inaccurate
	Geophysical surveys	Perform geophysical surveys using appropriate methods	Bias locations based upon areas of visible or likely surface contamination, also areas of subsurface contamination based on historical information and/or process knowledge	Semiquantitative – Sampling based on biasing criteria stipulated in DQO Step 7
	Radiological surveys	Perform radiological surveys using appropriate methods	Bias locations based upon areas of visible or likely surface contamination	Semiquantitative - Locations based on biasing criteria stipulated in DQO Step 7
	Field Screening	Collect soil samples from stained areas or areas likely to have contamination	Bias locations based upon results of process knowledge and field observation	Semiquantitative - Sampling locations based on visual or process knowledge

Table A.1-4
Information Needs to Resolve Decision I
(Page 2 of 3)

Information Need	Information Source	Collection Method	Biasing Factors to Consider	Data Type/Metric
Nature of contamination	Biased Samples	Generate sampling points based on results of geophysical and radiological surveys and field screening	Send samples with highest survey/screening results to laboratory	Semiquantitative - Sampling based on survey and screening results
	Biased Samples	Additional points will be located near CAS features	Bias locations along/around features	Semiquantitative - Sampling based on CAS features
Decision: Define nature of contamination. Criteria 2: Analyses must be sufficient to detect COCs.				
Identification of all potential contaminants	Process knowledge and previous investigations of similar sites; Use analytical suite in Table A.1-6	Information documented in CSM and public reports – no additional data needed; comprehensive analytical suite developed to account for uncertainty	None	Qualitative – CSM has not been shown to be inaccurate
Analytical results	Data packages of biased samples	Appropriate sampling techniques and approved analytical methods will be used; Minimum detection limits (MDLs) and minimum detectable activity (MDA) are sufficient to provide quantitative results for comparison to PALs	None	Quantitative – Validated analytical results will be compared to PALs

Decision: Determine if sufficient information exists to characterize waste.
Criteria: Analyses must be sufficient to allow disposal options to be accurately identified and estimated.

Table A.1-4
Information Needs to Resolve Decision I
(Page 3 of 3)

Information Need	Information Source	Collection Method	Biasing Factors to Consider	Data Type/Metric
Radiological data for comparison to unrestricted release criteria.	Radiological surveys and swipe measurement.	Perform radiological surveys and swipe measurements using appropriate methods.	Bias locations based upon areas of visible or likely surface spills/leaks, and areas of accumulation.	Semiquantitative – Locations based on biasing criteria stipulated in DQO Step 7.
Analytical results	Data packages of analytical results; Use analytical suite in Table A.1-6; Require TCLP if results are >20X TCLP limits	Appropriate sampling techniques and approved analytical methods will be used MDLs and MDA are sufficient to provide quantitative results for comparison to disposal requirements	Sufficient material must be available for analysis	Quantitative – Validated analytical results will be compared to disposal criteria

Quantitative Data

Quantitative data measure the quantity or amount of a characteristic or component within the population of interest. These data require the highest level of QA/QC in collection and measurement systems because the intended use of the data is to resolve primary decisions (i.e., rejecting or accepting the null hypothesis) and/or verifying closure standards have been met. Laboratory analytical data are generally considered quantitative.

Semiquantitative Data

Semiquantitative data indirectly measure the quantity or amount of a characteristic or component. Inferences are drawn about the quantity or amount of a characteristic or component because a correlation has been shown to exist between the indirect measurement and the results from a quantitative measurement. The QA/QC requirements on semiquantitative collection and measurement systems are high but may not be as rigorous as a quantitative measurement system. Semiquantitative data contribute to decision making but are not used alone to resolve primary decisions. Field-screening data are generally considered semiquantitative. The data are often used to guide investigations toward quantitative data collection.

Table A.1-5
Information Needs to Resolve Decision II

Information Need	Information Source	Collection Method	Biasing Factors to Consider	Data Type/Metric
Decision II: Determine the extent of contamination. Criteria 1: Data collection and analysis methods must be sufficient to detect COCs.				
Identification of applicable contaminants	Sample data packages	Review analytical results to select COCs	None	Quantitative – Only COCs identified will be analyzed in subsequent samples
Extent of contamination	Field observations	Document field observations	None	Qualitative – CSM has not been shown to be inaccurate
	Field-screening results	Conduct field screening with appropriate instrumentation	Bias locations based upon results of process information and field observations	Semiquantitative – FSRs will be compared to field screening levels
	Analytical results	Appropriate sampling techniques and approved analytical methods will be used to bound COCs	None	Quantitative – Validated analytical results will be compared to PALs to determine COC extent

Qualitative Data

Qualitative data identify or describe the characteristics or components of the population of interest. The QA/QC requirements are the least rigorous on data collection methods and measurement systems. The intended use of the data is for information purposes, to refine conceptual models, and guide investigations rather than resolve primary decisions. This measurement of quality is typically assigned to historical information and data where QA/QC may be highly variable or not known. Professional judgement is often used to generate qualitative data.

Metrics provide a tool to determine if the collected data support decision making as intended. Metrics tend to be numerical for quantitative and semiquantitative data, and descriptive for qualitative data.

A.1.3.2 Determine the Basis for the Preliminary Action Levels

To define both nature and extent, laboratory analytical results for soils will be compared to the following PALs to evaluate if COPCs are present at levels that may pose an unacceptable risk to human health and/or the environment:

- EPA Region 9 Risk-Based PRGs for chemical constituents in industrial soils (EPA, 2000)
- Background concentrations for RCRA metals will be used instead of PRGs when natural background exceeds the PRG, as is often the case with arsenic on the NTS. Background is considered the mean plus two times the standard deviation of the mean for sediment samples collected by the Nevada Bureau of Mines and Geology throughout the Nellis Air Force Range (NBMG, 1998; Moore, 1999).
- The TPH action limit of 100 ppm per the NAC 445A.2272 (NAC, 2000)
- The PALs for radionuclides are isotope-specific and defined as the maximum concentration for that isotope found in samples from undisturbed background locations in the vicinity of the NTS (McArthur and Miller, 1989; US Ecology and Atlan-Tech, 1992; BN, 1996). If an isotope has not been reported in soil samples taken from undisturbed background locations, the PAL will be equal to the minimum detectable activity (Table 3-4).
- For detected chemical COPCs without established PRGs, a similar protocol to that used by EPA Region 9 will be used in establishing an action level for those COPCs listed in IRIS (EPA, 2002).

At locations such as the CASs in Yucca Flat, surface soil radionuclide concentrations greater than PALs may not be a concern to CAU 204 if the concentrations are associated with fallout from atmospheric nuclear testing. As discussed in Section A.1, potential contamination of bunker exteriors that is related to atmospheric testing will be addressed by the Soils Project.

Solid media such as concrete and/or structures may only pose a potential radiological exposure risk to site workers. Surface radiological surveys of the solid media will be compared to the unrestricted-release criteria, as defined in the *NV/YMP Radiological Control Manual* (DOE/NV, 2000), to evaluate if COPCs are present at levels that may pose an unacceptable risk to human health and/or the environment.

A.1.3.3 Potential Sampling Techniques and Appropriate Analytical Methods

Sampling

Augering, direct-push, excavation, drilling, or other appropriate sampling methods will be used to collect soil samples. Sample collection and handling activities will follow standard procedures. Radiological surveys and swipe collection and measurement will also follow standard procedures.

At all CASs within CAU 204, both site characterization and waste characterization efforts are proposed. Site characterization sampling and analysis are the focus of the DQO process. However, waste characterization sampling and analysis has been addressed to support the decision-making process for waste management, and also to ensure an efficient field program.

Samples from vents, ducts, filters, and equipment may be collected, as appropriate, and submitted for analysis. Specific analyses required for the disposal of IDW are identified in Section 5.0 of the CAIP.

Analytical Program

To ensure that laboratory analyses are sufficient to detect contamination in samples at concentrations exceeding the MRL, chemical and/or radiological parameters of interest have been selected for each CAS. The parameters for each CAS are identified in Table A.1-6. The analytical program was developed based on the suspected-contaminant information presented in Section A.1.1.3.2. Because complete information regarding activities performed at these sites, as well as throughout the NTS, is unavailable, some uncertainty exists regarding the complete list of suspected contaminants at CAU 204. Due to this uncertainty, additional constituents have been included in the analytical program for the investigation. Analytical methods and laboratory requirements (e.g., detection limits, precision, and accuracy) are specified in the Industrial Sites QAPP (NNSA/NV, 2002), unless superseded by the CAIP.

Critical analytes are defined as the chemicals and radionuclides that are suspected to be present at the CASs based on the suspected-contaminant information presented in Section A.1.1.3.2. Because information such as documented use or process knowledge exists for critical analytes, these analytes are given greater importance in the decision-making process relative to other COPCs. For this reason, more stringent performance criteria are specified for critical analyte data quality indicators

Table A.1-6
Analytical Program
(Includes Site and Waste Characterization Analyses)

Analyses[a]	01-34-01	02-34-01	03-34-01	05-18-02	05-33-01	05-99-02
Organics						
Total Petroleum Hydrocarbons (Diesel- and Gasoline-Range Organics)	X	X	X	X	X	--
Polychlorinated Biphenyls	X	X	X	X	X	X
Semivolatile Organic Compounds	X	X	X	X	X	X
Volatile Organic Compounds	X	X	X	X	X	X
Rodenticide						
Warfarin	--	--	--	--	--	X
Zinc	--	--	--	--	--	X
Metals						
Total *Resource Conservation and Recovery Act* Metals[b]	X	X	X	X	X	X
Total Beryllium	X	X	X	X	X	X
Other						
Asbestos	X	X	X	X	X	--
Explosives	--	--	--	X	X	X
Radionuclides						
Gamma Spectrometry[c]	X	X	X	X	X	--
Isotopic Uranium	X	X	X	X	X	--
Isotopic Plutonium	X	X	X	X	X	--
Strontium-90	X	X	X	X	X	--

-- = Not applicable

[a]If the volume of material is limited, prioritization of the analyses will be necessary.
[b]May also include Toxicity Characteristic Leaching Procedure metals if sample is collected for waste management purposes.
[c]If americium-241 is detected above the minimum detectable activity, isotopic americium-241 may also be performed on sample.

(Section 6.0 of the CAIP). Table A.1-7 presents the critical analytes for samples collected to define the nature of contamination (Decision I).

Table A.1-7
Critical Analytes for Nature of Contamination (Decision I) Sampling

CAS	Critical Analytes	
	Chemical	Radiological
01-34-01	Lead PCBs[a] TPH (DRO) Silver (for CAS 02-34-01 only)	Americium-241 Cesium-137 Cobalt-60 Europium-152,-154 Plutonium-238,-239/240 Strontium-90
02-34-01		
03-34-01		
05-18-02	Beryllium High Explosives[c] Lead PCBs[a] TPH (DRO and GRO)	Americium-241 Cesium-137 Cobalt-60 Europium-152,-154 Plutonium-238,-239/240 Strontium-90 Uranium-234,-235,-238
05-33-01	Beryllium High Explosives[c] PCBs[a] TPH (DRO and GRO)	
05-99-02	Zinc (associated with rodenticide) High Explosives[c] Warfarin	none

CAS = Corrective Action Site
DRO = Diesel-range organics
GRO = Gasoline-range organics
PCB = Polychlorinated biphenyl
TPH = Total petroleum hydrocarbons

For sampling performed to define the extent of contamination (Decision II), on a per CAS basis, samples will be collected and analyzed only for COCs identified in samples collected to resolve Decision I at that CAS. However, if extent samples are collected prior to nature-of-contamination data becoming available, the extent samples will be analyzed for the full list parameters given for each CAS in Table A.1-6. For samples collected to define the extent of contamination, critical analytes are the COCs based on the data from the Decision I samples. These critical analytes may be different than those listed for each CAS in Table A.1-7.

A.1.4 Step 4 - Define the Boundaries of the Study

The purpose of this step is to define the target population of interest, specify the spatial and temporal features of that population that are pertinent for decision making, determine practical constraints on data collection, and define the scale of decision making relevant to target populations.

A.1.4.1 Define the Target Population

The target populations for investigation of the nature of contamination (Decision I) represent locations within the CAS that will contain COCs, if they are present. The target populations are dependent upon the CSM(s) applicable to the CAS.

The target populations for investigation of the extent of contamination (Decision II) are areas where COC concentrations are less than PALs that are contiguous to areas of COC contamination.

These target populations represent locations within the system that, when sampled, will provide sufficient data to address data needs discussed in Section A.1.3.

A.1.4.2 Identify the Spatial and Temporal Boundaries

The spatial boundaries that apply to each CAS are listed in Table A.1-8. The smaller horizontal boundaries at CASs 01-34-01, 02-34-01, 03-34-01, and 05-99-02 reflect the better-defined footprint of the area of concern (i.e., bunker) at these CASs relative to CASs 05-18-02 and 05-33-01. As discussed in Section 1.0, contamination related to atmospheric nuclear testing outside the bunkers will be addressed by the Soils Project. Even though this contamination has been "superimposed" on the CAU 204 CASs, it will not be investigated by CAU 204.

Temporal boundaries are time constraints due to time-related phenomena, such as weather conditions, seasons, activity patterns, etc. Significant temporal constraints due to weather conditions are not expected; however, snow events may affect site access during December, January, and February. Moist weather may place constraints on sampling and field-screening of contaminated soils because of the attenuating effect of moisture in samples. There are no time constraints on collecting samples as environmental conditions at all sites will not significantly change in the near future, and conditions would have stabilized over the years since the sites were last used.

Table A.1-8
Spatial Boundaries Investigation

CAS	Spatial Boundary	
	Horizontal	Vertical
01-34-01	25-ft buffer around the CAS	30 ft bgs
02-34-01	25-ft buffer around the CAS	30 ft bgs
03-34-01	25-ft buffer around the CAS	30 ft bgs
05-18-02	50-ft buffer around the CAS	30 ft bgs
05-33-01	50-ft buffer around the CAS	30 ft bgs
05-99-02	25-ft buffer around the CAS	30 ft bgs

A.1.4.3 Identify Practical Constraints

Nevada Test Site-controlled activities may affect the ability to characterize these CASs, although the sites are generally abandoned without any ongoing activity. Table A.1-9 indicates practical constraints that may be encountered at each CAS.

Table A.1-9
Practical Constraints Identified for CAU 204

CAS	Utilities Likely to be Encountered[a]	Topography/Site Conditions Likely to Affect Planned Activities	Structures (Tanks/Pipes/Bldgs) Likely to Affect Planned Activities	Area Subject to Access Restrictions[b]	Confined Space, Health & Safety, Structural Integrity Issues
01-34-01	yes	no	no	no	yes
02-34-01	yes	no	no	no	yes
03-34-01	yes	no	no	yes	yes
05-18-02	yes	no	yes	no	yes
05-33-01	yes	no	yes	yes	yes
05-99-02	yes	no	no	no	yes

Source: Site visits.

[a]Utility constraints are subject to change as detailed information is collected prior to commencement of investigation activities, and will be appropriately documented. All CASs will be surveyed for utilities prior to field activities in accordance with the SSHASP. Does not include underground piping that is included as part of the CAS.

[b]Access restrictions include both scheduling conflicts on the NTS with other entities, and areas posted as contamination areas requiring appropriate work controls, and areas requiring authorized access.

A.1.4.4 Define the Scale of Decision Making

For CASs 01-34-01, 02-34-01, 03-34-01, and 05-99-02, the scale of decision making for the nature of contamination is defined as the CAS. For CASs 05-18-02 and 05-33-01, the scale of decision making is defined as the individual releases within the CAS or area around the point of release.

The scale of decision making for the investigation of the extent of contamination is defined as the maximum extent of COC contamination. Additionally, the scale of decision making for an unrestricted release determination is the entire object/structure (e.g., steel pipe, concrete structure) surveyed.

A.1.5 Step 5 - Develop a Decision Rule

This step integrates outputs from the previous steps, with the inputs developed in this step into a decision rule (*"If..., then..."*) statement. This rule describes the conditions under which possible alternative actions would be chosen.

A.1.5.1 Specify the Population Parameter

The population parameter will be the observed concentration of each COC within the target population.

A.1.5.2 Choose an Action Level

Action levels are defined as the PALs, which are defined in Section A.1.3.2. As appropriate, action levels may also be the unrestricted release criteria given in the *NV/YMP Radiological Control Manual* (DOE/NV, 2000).

A.1.5.3 Measurement and Analysis Methods

The measurement and analysis methods in the Industrial Sites QAPP (NNSA/NV, 2002) are capable of achieving the expected range of values to resolve nature and extent. The detection limit of the measurement method to be used is less than the PAL for each COPC, unless specified otherwise in the CAIP.

A.1.5.4 Decision Rule

If the concentration of any COPC in a target population exceeds the PAL for that COPC, then that COPC is identified as a COC, and the nature of contamination (Decision I) will be determined. If the COPC concentration is less than the PAL, then the decision will be no further action.

If investigation of the nature of contamination determines that a COC is present, then additional samples will be collected to define extent of contamination (Decision II). If the observed concentrations in the additional samples are less than the PAL, then the decision will be that the extent of contamination has been defined in the vertical and/or horizontal direction.

If contamination is inconsistent with the CSM or extends beyond the spatial boundaries identified in Table A.1-8, then work will be suspended and the investigation strategy will be reevaluated. If contamination is consistent with the CSM and is within spatial boundaries, then the decision will be to continue sampling to define extent.

A.1.6 Step 6 - Specify the Tolerable Limits on Decision Errors

The sampling approach for the investigation relies on biased sampling locations. Only validated analytical results (quantitative data) will be used to determine if COCs are present. The baseline condition (i.e., null hypothesis) and alternative condition for the investigation of the nature of contamination are:

- Baseline condition – A COC is present.
- Alternative condition – A COC is not present.

The baseline condition (i.e., null hypothesis) and alternative condition for the investigation of the extent of contamination are as follows:

- Baseline condition – The extent of a COC has not been defined.
- Alternative condition – Extent of a COC has been defined.

Decisions and/or criteria have an alpha (false negative) or beta (false positive) error associated with their determination (discussed in the following subsections). Since quantitative data are individually compared to action levels, statistical evaluations of the data such as averages or confidence intervals are not appropriate.

A.1.6.1 False Negative Decision Error

The false negative (rejection or alpha) decision error would mean deciding that a COC is not present when it is, or that the extent of a COC has been defined when it has not. In both cases, this would result in an increased risk to human health and environment.

A false negative decision error (where consequences are more severe) is controlled by meeting these criteria: (1) having a high degree of confidence that the sample locations selected will identify COCs if present anywhere within the CAS or that they will identify the extent of COCs, and (2) having a high degree of confidence that analyses conducted will be sufficient to detect any COCs present in the samples.

To satisfy the first criterion for the determination of the nature of contamination, data and samples will be collected in areas most likely to be contaminated by any COCs. To satisfy the first criterion for the determination of the extent of contamination, data collection will sample areas that represent the lateral and vertical extent of contamination. To accomplish this, the following characteristics are considered:

- Source and location of release
- Chemical nature and fate properties
- Physical transport pathways and properties
- Hydrologic drivers

These characteristics were considered during the development of the CSMs. The biasing factors listed in Section A.1.3.1 will be used to further ensure that these criteria are met.

To satisfy the second criterion, all samples used to define nature of contamination will be analyzed for the chemical and radiological parameters listed in Section A.1.3.3 using analytical methods that are capable of producing quantitative data to concentrations below or equal to PALs (unless stated otherwise in the CAIP). For those samples used to define the extent of contamination, samples will be analyzed for those chemical and radiological parameters that have been identified as COCs in previous samples. Strict adherence to established procedures and QA/QC protocol protects against false negatives.

A.1.6.2 False Positive Decision Error

The false positive (acceptance or beta) decision error would mean deciding that a COC is present when it is not, or accepting that the extent of a COC has not been defined when it really has, resulting in increased costs for unnecessary characterization or corrective action, respectively.

The false positive decision error is controlled by protecting against false positive analytical results. False positive results are typically attributed to laboratory and/or sampling/handling errors. Quality assurance/QC samples such as field blanks, trip blanks, laboratory control samples, and method blanks minimize the risk of a false positive analytical result. Other measures include proper decontamination of sampling equipment and using certified clean sample containers to avoid cross-contamination.

A.1.6.3 Quality Assurance/Quality Control

Geophysical, if used, and radiological survey instruments will be calibrated in accordance with the manufacturer's instructions, and periodic calibrations will be performed in accordance with approved procedures.

Quality control samples will be collected as required by established procedures. The required QC samples include:

- Trip blanks (1 per sample cooler containing VOC environmental samples)
- Equipment blanks (1 per sampling event for each type of decontamination procedure)
- Source blanks (1 per source lot per sampling event)
- Field duplicates (minimum of 1 per matrix per 20 environmental samples or 1 per CAS if less than 20 collected)
- Field blanks (minimum of 1 per 20 environmental samples, or 1 per CAS if less than 20 collected)
- Matrix spike/matrix spike duplicate (minimum of 1 per matrix per 20 environmental samples or 1 per CAS if less than 20 collected, not required for all radionuclide measurements)

Additional QC samples may be submitted based on site conditions.

Data Quality Indicators of precision, accuracy, comparability, completeness, and representativeness are defined in the Industrial Sites QAPP (NNSA/NV, 2002). In addition, sensitivity has been included as a DQI for laboratory analyses. Site-specific DQIs are discussed in more detail in Section 6.0 of the CAIP.

A.1.7 Step 7 - Optimize the Design for Obtaining Data

This section presents an overview of the strategy to be used to obtain the data required to meet the project DQOs developed in previous steps. Section A.1.7.1 provides general investigation activities for each CSM, and the planned sampling strategy for each CAS is detailed in Section A.1.7.2.

A.1.7.1 General Investigation Strategy

Radiological and geophysical surveys of the ground surface will be conducted at selected CASs in CAU 204 prior to intrusive sampling. These surveys are currently planned for the Kay Blockhouse, CAS 05-33-01, as part of preinvestigation activities. Radiological surveys of the ground surface within the CAS boundaries will also be performed at CASs 01-34-01, 02-34-01, 03-34-01, and 05-18-02. Radiological surveys of the interiors of the bunkers will be conducted at all of the CASs to determine if radiological contamination is present within the bunkers.

The interior of the bunkers will be visually inspected and photodocumented. The inspection will focus on evidence of contamination and potential released to the environment outside the bunkers. The inspection will also include an inventory of objects and equipment within the bunkers, with an emphasis on waste management concerns. Samples to determine the nature of contamination and/or for waste characterization will be collected from bunker interiors, as appropriate.

Intrusive investigations will be conducted at CASs 05-18-02, 05-33-01, and 05-99-02 to determine if COCs are present and, if present, to determine the extent. Intrusive investigations are not planned for CASs 01-34-01, 02-34-01, or 03-34-01, nor the interior of the bunkers at CASs 05-18-02 and 05-33-01. However, if field information indicates that a release to the environment from any of these five bunkers has occurred, sampling will be performed, as described below.

Samples will be collected from biased locations based on the results of the geophysical and radiological surveys and other biasing factors listed in Section A.1.3.1. Rotary sonic drilling,

hollow-stem auger drilling, direct-push, handheld augers, or excavation may be used, as appropriate, to access subsurface sample intervals for laboratory analysis at select locations. Due to the nature of buried features possibly present at these sites (e.g., structures, buried debris, and utilities), sample locations may be biased adjacent to a buried feature, based upon the review of engineering drawings, and information obtained during site walkovers. The locations may also be biased, based upon specific site conditions encountered. Surface soil samples (<0.5 ft bgs) will be collected by hand according to approved procedures.

Although not specifically discussed in the following subsections, samples for waste characterization purposes may be collected from the interior or exterior of the bunker at any CAS. Samples from vents, ducts, filters, and equipment may be collected and submitted for analysis, as appropriate.

A.1.7.1.1 Investigation Strategy for CSM #1

The bunker interiors, with concrete floors and walls, will be investigated under the CSM #1. Initially, a visual inspection (including photodocumentation) will be performed on the interior of each bunker, and potential contamination will be identified and documented. The investigation will identify any potential pathways (i.e., vents, exterior doorways, significant cracks in concrete floor). Specifically, the investigation will focus on any staining on the floor or walls that would indicate a spill or other release within the bunker. Next, an inventory will be made of objects and equipment present in the bunkers, with an emphasis on waste management concerns (e.g., fluorescent light ballasts, fluids in equipment, or asbestos). Samples from vents, ducts, filters, and equipment may be collected and submitted for analysis, as appropriate. A radiological survey of the bunker interiors will be performed, focusing on any potential pathways, in order to obtain an indication of whether or not radiological contamination is present.

If there are no biasing factors (e.g., staining, elevated radiological readings) to indicate potential contamination, then no samples will be required. However, if biasing factors indicate that contamination may be present, samples will be collected for laboratory analysis at the potentially contaminated location. If unconsolidated media are available and if appropriate, this material will be collected for laboratory analysis; but, if no such material is available, then the concrete surface will be scabbled in order to obtain the necessary quantity of material to be analyzed. If no biasing factors are present but unconsolidated media are present and if appropriate, this material may be collected in

order to confirm the assumption of no contamination. If the investigation of a bunker interior indicates that contamination potentially reached the outside environment, that contamination will be investigated according to the strategy discussed for CSM #2.

A.1.7.1.2 Investigation Strategy for CSM #2

Intrusive investigations will be conducted at each of the CASs with surface debris/burn areas to determine if any COCs are present and, if present, to determine the extent. As discussed in Section A.1.7.1.1, potential ground surface contamination originating from the interior of a bunker (e.g., from a vent or door) will also be investigated. Locations for sampling will be based on the results of the radiological and geophysical surveys and other biasing factors listed in Section A.1.3.1.

Samples will be selected from biased locations focusing on contamination that may have migrated from the suspected source area, considering the potential for lateral surface migration prior to infiltration. The frequency of sample intervals will be based on biasing factors such as: debris, staining, odor, low points, and field-screening results. Direct-push, hand auger, drilling, and/or excavation will be used to access soil sample intervals at select locations. Surface intervals (<0.5 ft bgs) will be collected by hand.

A.1.7.1.3 Investigation Strategy for CSM #3

Intrusive investigations will be conducted at each of the CASs with subsurface debris/burn areas to determine if any COCs are present and, if present, to determine the extent. Locations for these samples will be based on the results of the radiological and geophysical surveys and other biasing factors listed in Section A.1.3.1.

Sample intervals will be selected from the biased locations focusing on any contamination that may be present within or migrated from the disposal feature. The frequency of sample intervals below the waste/soil interface will be based on biasing factors such as: presence of debris, staining, odor, or field-screening results. Direct-push, hand auger, drilling, and/or excavation will be used to access soil sample intervals at select locations.

A.1.7.2 Site-Specific Sampling Strategy

The planned sampling strategy for each CAS is listed in Table A.1-10. The biasing factors listed in Section A.1.3.1 will be used to determine sampling locations. Where soil sampling is proposed in Table A.1-10, if field-screening results greater than FSLs or other biasing factors indicate the presence of contamination at levels above the PALs, an extent investigation will be instituted.

Table A.1-10
Planned Sampling Strategy
(Page 1 of 4)

CAS	Sampling Strategy[a]
01-34-01 Underground Instrument House Bunker (Building 1-300)	**Interior** A visual inspection, including photodocumentation, of all accessible spaces will be performed. The inspection will focus on identifying potential contamination and pathways to the exterior environment. The inspection will include an inventory of objects, materials, and equipment inside the bunker. The emphasis of this inventory will be to gather information to support waste management decisions. A radiological survey of the bunker interior, including exterior doors, vents, equipment, and pipe runs, etc. will be performed. If biasing factors such as staining on the floor or areas of elevated radiological survey/swipe readings are present, and sufficient and appropriate unconsolidated material is present, a minimum of one sample of the material will be collected for analysis. If unconsolidated material is not present and staining or radiological contamination of the concrete is observed, the concrete may be characterized by other means (e.g., scabble or swipe, followed by analysis). Samples from vents, ducts, filters, and equipment may be collected and submitted for analysis to support waste characterization, as appropriate.
02-34-01 Instrument Bunker (Building 2-300)	
03-34-01 Underground Bunker (Building 3-300)	**Exterior** Walk-over radiological land-area survey of the ground surface within the CAS boundaries will be performed. If the results of this radiological survey or the results of the interior characterization indicate that the exterior may have been contaminated by activities that took place at or within the bunker, surface soil samples will be collected based on biasing factors (e.g., staining, radiological survey data, or field-screening results). If COCs are detected or suspected, additional soil samples from deeper intervals at existing locations or from step-out locations will be collected to define the extent of contamination.
05-18-02 Chemical Explosives Storage (Sugar Bunker)	**Interior** A visual inspection, including photodocumentation, of all accessible spaces will be performed. The inspection will focus on identifying potential contamination and pathways to the exterior environment. The inspection will include an inventory of objects, materials, and equipment inside the bunker. The emphasis of this inventory will be to gather information to support waste management decisions.

Table A.1-10
Planned Sampling Strategy
(Page 2 of 4)

CAS	Sampling Strategy[a]
05-18-02 Chemical Explosives Storage (Sugar Bunker)	**Interior** A radiological survey of the bunker interior, including exterior doors, vents, equipment, and pipe runs, etc. will be performed. If biasing factors such as staining on the floor or areas of elevated radiological survey/swipe readings are present, and sufficient and appropriate unconsolidated material is present, a minimum of one sample of the material will be collected for analysis. If unconsolidated material is not present and staining or radiological contamination of the concrete is observed, the concrete may be characterized by other means (e.g., scabble or swipe, followed by analysis). **Exterior** A walk-over radiological land-area survey of the ground surface within the CAS boundaries has been performed. Additional radiological surveys may be performed, as necessary, to support the investigation. Surface soil samples will be collected from a minimum of three biased locations based on the results of the radiological land area survey. Additional surface soil samples will be collected from a minimum of three locations south of the bunker in an area where a previous investigation had detected above background concentrations of beryllium. In addition to the radiological land-area survey and previous beryllium sampling data, if biasing factors are present (e.g., staining), surface soil samples will be collected as appropriate. Also, if the results of the interior characterization indicate that a release to the exterior may have occurred due to activities that took place within the bunker, a surface soil sample or samples will be collected where contamination is suspected. If COCs are detected or suspected, additional soil samples from deeper intervals at existing locations or from step-out locations will be collected to define the extent of contamination.
05-33-01 Kay Blockhouse	**Interior** A visual inspection, including photodocumentation, of all accessible spaces will be performed. The inspection will focus on identifying potential contamination and pathways to the exterior environment. The inspection will include an inventory of objects, materials, and equipment inside the bunker. The emphasis of this inventory will be to gather information to support waste management decisions. A radiological survey of the bunker interior, including exterior doors, vents, equipment, and pipe runs, etc. will be performed. If biasing factors such as staining on the floor or areas of elevated radiological survey/swipe readings are present, and sufficient and appropriate unconsolidated material is present, a minimum of one sample of the material will be collected for analysis. If unconsolidated material is not present and staining or radiological contamination of the floor is observed, the floor material may be sampled for analysis or characterized by other means (e.g., scabble or swipe), if appropriate.

Table A.1-10
Planned Sampling Strategy
(Page 3 of 4)

CAS	Sampling Strategy[a]
05-33-01 Kay Blockhouse	**Exterior** A walk-over radiological land area survey and a geophysical survey of the ground surface within the CAS boundaries have been performed. Additional radiological land area surveys may be performed, as necessary, to support the investigation. Also, to support waste management decisions, radiological release surveys of debris and equipment will be performed within the CAS boundaries. Numerous areas and features are present within the CAS boundary where, based on visual evidence, a contaminant release may have occurred. These areas and features include, burn areas, burn pits, open pits, steel-lined pits, areas inside soil berms, soil disturbances, and areas of debris. In some instances, these areas and features may coincide with the location of elevated radiological readings and/or geophysical anomalies. Based on the survey results and visual evidence, sampling at CAS 05-33-01 will be conducted as follows: A minimum of one surface or subsurface soil sample will be collected from each area or feature where a release may have occurred. Biasing factors may include radiological survey results, geophysical anomalies, stained or discolored soil, low spots in depressions, or the presence of debris. Samples will be collected from the appropriate surface and/or subsurface depth intervals, based on current site conditions observed during the investigation. The typical biased sample interval will be the soil interval immediately below the waste/native soil interface. Surface soil samples will be collected from six of the seven locations of elevated radiological levels identified during the walk-over survey. Samples will not include large fragments of metal or other materials that may be the source of the elevated radiological levels. The seventh location that will not be sampled is a location where "trinity glass" was observed. This material was generated during atmospheric nuclear testing, which is not part of scope of the CAU 204 CAI.
05-33-01 Kay Blockhouse (Continued)	The geophysical anomalies will be investigated by collecting surface soil and subsurface soil samples, as appropriate. Generally, the anomalies coincide with surface features that are already targeted for sampling. However, the anomaly interpreted as a fill area/trench feature in the northern sites area will be investigated by excavating a trench perpendicular to the long axis of the feature. A minimum of one soil sample will be collected from the trench. Also, if the results of the interior characterization indicate that a release to the exterior may have occurred due to activities that took place within the bunker, a surface soil sample or samples will be collected where contamination is suspected. If COCs are detected or suspected, additional soil samples from deeper intervals at existing locations or from step-out locations will be collected to define the extent of contamination.

Table A.1-10
Planned Sampling Strategy
(Page 4 of 4)

CAS	Sampling Strategy[a]
05-99-02 Explosive Storage Bunker (Bunker 803)	**Interior** A visual inspection of the bunker, including photodocumentation, will be performed. The inspection will focus on identifying potential contamination and pathways to the exterior environment. The inspection will include an inventory of objects, materials, and equipment inside the bunker. The emphasis of this inventory will be to gather information to support waste management decisions. A radiological survey of bunker walls and floor will be performed, focusing on potential pathways to the environment (e.g., doorway, floor, and bottom of walls). A minimum of one surface soil sample will be collected from the floor within the bunker based upon biasing factors such as staining or radiological survey results. **Exterior** If the results of the interior characterization indicate that the exterior may have been contaminated by activities that took place at or within the bunker, surface soil samples will be collected based on biasing factors (e.g., staining, radiological survey data, or field-screening results). If COCs are detected or suspected, additional soil samples from deeper intervals at existing locations or from step-out locations will be collected to define the extent of contamination.

[a]The sampling locations may be altered based upon additional information.

A.1.8 References

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APPENDIX B.

SAMPLE ANALYTICAL RESULTS

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SAMPLE ANALYTICAL RESULTS
CAS 05-33-01, KAY BLOCKHOUSE

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142418

Bechtel Nevada

ANALYTICAL LABORATORY

SERVICES REQUEST AND CHAIN OF CUSTODY RECORD

Page 1 of 2

PROJECT / CLIENT INFORMATION

Project: CAU 204 | BN Org#: B502

Charge Number: 5B08 AD50

Project Manager: JEFF SMITH

Phone: 5-7775 | Fax: 5-7761 | M/S: NTS306

REPORT & TURNAROUND INFORMATION

Send Report to: DAVID NACHT

Phone: 5-5577 | Fax: 5-7761 | M/S: NTS306

Turnaround: ( ) Standard – 14 days IH, 28 days Non-rad Env, 45 days Rad Env
( ) RUSH Preliminary by: _____ (IH)
__1 __2 __7 __14 (non-Rad Env)
__1 __7 ✓14 __28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 204 CAS 05-33-01

The samples submitted contain (check);
( ) **Hazardous** - *(list)* _____
( ) **Radioactive** - *(list)* _____
( ) **Unknown** contamination. If known, identify contaminants. This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) _____ (Non-Rad Env) V2518 (Rad Env)

Samples submitted are associated with a signed Project SOW. (✓) YES ( ) NO

Analyses entered here agree with the SOW. (✓) YES ( ) NO ( ) N/A

If not, identify the variation: _____

Subcontract Lab(s) used for this work: GEL

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres – Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: NGS-A-002	Gamma Spec.
053301-R1	7/21/05	1035	SOIL	1 EA	500mL						✓
053301-R2		1037									✓
053301-R3		1039									✓
053301-R4		1041									✓
053301-R5		1043									✓
053301-R6		1045									✓

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	DATE / TIME	Received by (print)	Signature	DATE / TIME
Mike Floyd	/s/ Signature on file	7/21/05 1700	Refer	/s/ Signature on file	7/21/05 1700
Refer	/s/ Signature on file	7/27/05 0910	Dudley Emert	/s/ Signature on file	7/27/05 0910
Dudley Emert	/s/ Signature on file	7/28/05 16:30	Refer	/s/ Signature on file	
Refer	/s/ Signature on file	8/4/05 0930	Mike Floyd	/s/ Signature on file	8/4/05 0930
Mike Floyd	/s/ Signature on file	8/4/05 0937	C.D. CASTANEDA	/s/ Signature on file	8/4/05 @ 0937
CA CASTANEDA	/s/ Signature on file	8/4/05 @ 1300	Fed Ex # 790600338131		8/4/05 @ 1300

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

circle a/c

Radiochemistry Case Narrative
Bechtel Nevada (NEVA)
SDG V2518

Method/Analysis Information

Product:	**Alphaspec U, Solid**
Analytical Method:	DOE EML HASL-300, U-02-RC Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	451944
Prep Batch Number:	450772
Dry Soil Prep GL-RAD-A-021 Batch Number:	450771

Sample ID	Client ID
142418007	053301-RU1
142418008	053301-RU2
142418009	053301-RU3
142418010	053301-RU4
142418011	053301-RU5
142418012	053301-RU6
1200910037	Method Blank (MB)
1200910038	142418007(053301-RU1) Sample Duplicate (DUP)
1200910039	Laboratory Control Sample (LCS)

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 14.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 142418007 (053301-RU1).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Preparation Information
All preparation criteria have been met for these analyses.

Sample Re-prep/Re-analysis
Sample 1200910037 (MB) was recounted due to a suspected blank false positive.
Sample 142418010 (053301-RU4) was reprepped due to poor resolution.

Miscellaneous Information:

NCR Documentation
Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. An NCR was not generated for this SDG.

Manual Integration
No manual integrations were performed on data in this batch.

Additional Comments
U-3/4 blank activity is greater than the MDA and RDL, but less than five percent of the least active sample.

Qualifier information
Manual qualifiers were not required.

Method/Analysis Information

Product:	**Gammaspec, Gamma, Solid**
Analytical Method:	EML HASL 300, 4.5.2.3
Prep Method:	Dry Soil Prep
Analytical Batch Number:	450963
Prep Batch Number:	450398

Sample ID	Client ID
142418001	053301-R1
142418002	053301-R2
142418003	053301-R3
142418004	053301-R4
142418005	053301-R5
142418006	053301-R6
1200907819	Method Blank (MB)
1200907820	142418001(053301-R1) Sample Duplicate (DUP)
1200907821	Laboratory Control Sample (LCS)

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 10.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

Designated QC
The following sample was used for QC: 142418001 (053301-R1).

QC Information
All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Preparation Information
All preparation criteria have been met for these analyses.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:

NCR Documentation
Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. An NCR was not generated for this SDG.

Qualifier information

Qualifier	Reason	Analyte	Sample
X	Data rejected due to interference.	Cesium-134	142418006
		Europium-155	142418002
			142418005
X	Data rejected due to low abundance.	Cesium-134	1200907820
			142418001
			142418002
			142418003
			142418004
			142418005

Certification Statement
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:
GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.
The following data validator verified the information presented in this case narrative:

Reviewer: /s/ Signature on file - 8/24/05

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis Report
for

NEVA002 Bechtel Nevada

Client SDG: V2518 GEL Work Order: 142418

The Qualifiers in this report are defined as follows:

** Indicates the analyte is a surrogate compound.
< Result is less than amount reported.
> Result is greater than amount reported.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
P The response between the confirmation and the primary columns is >40% Different.
R Sample results are rejected.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
Y QC Samples were not spiked with this compound.
Z Paint Filter qualifier: Particulates passed through the filter. No free liquids were observed.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.
** Indicates the analyte is a surrogate compound.
This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Julie Strock.

/s/ Signature on file

Reviewed by

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 – (843) 556–8171 – www.gel.com

Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	053301–R1	Project:	NEVA00101
Sample ID:	142418001	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	21–JUL–05		
Receive Date:	05–AUG–05		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch N
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Solid											
Actinium–228		2.03	+/–0.298	0.148	+/–0.298		pCi/g		JPH1 08/17/05	2102	450963 1
Americium–241	U	0.0718	+/–0.227	0.397	+/–0.227	0.200	pCi/g				
Antimony–125	U	–0.0174	+/–0.066	0.118	+/–0.066		pCi/g				
Cerium–144	U	–0.133	+/–0.179	0.319	+/–0.179		pCi/g				
Cesium–134	X	0.120	+/–0.038	0.0628	+/–0.038	0.100	pCi/g				
Cesium–137	U	0.0241	+/–0.0282	0.0459	+/–0.0282	1.00	pCi/g				
Cobalt–60	U	0.00999	+/–0.0566	0.0472	+/–0.0566		pCi/g				
Europium–152		0.130	+/–0.0948	0.127	+/–0.0948		pCi/g				
Europium–154	U	0.00447	+/–0.0814	0.143	+/–0.0814		pCi/g				
Europium–155	U	0.044	+/–0.116	0.176	+/–0.116		pCi/g				
Lead–212		2.22	+/–0.202	0.0801	+/–0.202		pCi/g				
Potassium–40		31.6	+/–2.19	0.391	+/–2.19		pCi/g				
Promethium–144	U	0.00149	+/–0.0268	0.0429	+/–0.0268		pCi/g				
Promethium–146	U	0.0465	+/–0.0359	0.0521	+/–0.0359		pCi/g				
Ruthenium–106	U	0.0168	+/–0.220	0.389	+/–0.220		pCi/g				
Thorium–234	U	2.78	+/–2.41	3.01	+/–2.41		pCi/g				
Uranium–235	U	0.0629	+/–0.190	0.323	+/–0.190	0.200	pCi/g				
Uranium–238	U	2.78	+/–2.41	3.01	+/–2.41	2.00	pCi/g				
Yttrium–88	U	0.0182	+/–0.0212	0.043	+/–0.0212		pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	0839	450398

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.

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Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: 053301-R1 Project: NEVA00101
Sample ID: 142418001 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch N

E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

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Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270
Mercury, Nevada 89023
Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: 053301–R2
Sample ID: 142418002
Matrix: Soil
Collect Date: 21–JUL–05
Receive Date: 05–AUG–05
Collector: Client

Project: NEVA00101
Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch N
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Solid											
Actinium–228		1.82	+/–0.288	0.106	+/–0.288		pCi/g		JPH1 08/17/05	2103	450963 1
Americium–241	U	0.0385	+/–0.119	0.206	+/–0.119	0.200	pCi/g				
Antimony–125	U	–0.0166	+/–0.041	0.0737	+/–0.041		pCi/g				
Cerium–144	U	–0.0966	+/–0.128	0.209	+/–0.128		pCi/g				
Cesium–134	X	0.083	+/–0.0325	0.0438	+/–0.0325	0.100	pCi/g				
Cesium–137	U	–0.0123	+/–0.0181	0.0306	+/–0.0181	1.00	pCi/g				
Cobalt–60		0.0393	+/–0.0287	0.0323	+/–0.0287		pCi/g				
Europium–152		0.278	+/–0.0834	0.0835	+/–0.0834		pCi/g				
Europium–154	U	0.0556	+/–0.0594	0.095	+/–0.0594		pCi/g				
Europium–155	X	0.128	+/–0.0882	0.113	+/–0.0882		pCi/g				
Lead–212		1.85	+/–0.156	0.0554	+/–0.156		pCi/g				
Potassium–40		31.4	+/–2.69	0.268	+/–2.69		pCi/g				
Promethium–144	U	–7.640E–05	+/–0.0172	0.0297	+/–0.0172		pCi/g				
Promethium–146	U	0.0104	+/–0.0207	0.0381	+/–0.0207		pCi/g				
Ruthenium–106	U	–0.0286	+/–0.159	0.276	+/–0.159		pCi/g				
Thorium–234		2.92	+/–1.62	1.59	+/–1.62		pCi/g				
Uranium–235	U	0.194	+/–0.167	0.219	+/–0.167	0.200	pCi/g				
Uranium–238		2.92	+/–1.62	1.59	+/–1.62	2.00	pCi/g				
Yttrium–88	U	0.00309	+/–0.0177	0.0279	+/–0.0177		pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	0839	450398

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.

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Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270
Mercury, Nevada 89023
Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: 053301–R2
Sample ID: 142418002
Project: NEVA00101
Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch I

E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab–specific qualifier–please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

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Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	053301–R3	Project:	NEVA00101
Sample ID:	142418003	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	21–JUL–05		
Receive Date:	05–AUG–05		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch I
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Solid											
Actinium–228		1.94	+/–0.266	0.203	+/–0.267		pCi/g		JPH1 08/17/05	2103	450963 1
Americium–241	U	–0.0091	+/–0.0697	0.131	+/–0.0697	0.200	pCi/g				
Antimony–125	U	–0.0113	+/–0.0734	0.132	+/–0.0734		pCi/g				
Cerium–144	U	0.0879	+/–0.186	0.304	+/–0.186		pCi/g				
Cesium–134	X	0.148	+/–0.057	0.0783	+/–0.0571	0.100	pCi/g				
Cesium–137	U	0.0247	+/–0.0603	0.0561	+/–0.0603	1.00	pCi/g				
Cobalt–60	U	0.00545	+/–0.0339	0.0612	+/–0.0339		pCi/g				
Europium–152	U	0.111	+/–0.0859	0.131	+/–0.0859		pCi/g				
Europium–154	U	0.0149	+/–0.0734	0.168	+/–0.0734		pCi/g				
Europium–155	U	0.0999	+/–0.084	0.148	+/–0.0841		pCi/g				
Lead–212		1.88	+/–0.0953	0.0793	+/–0.0977		pCi/g				
Potassium–40		29.7	+/–1.37	0.411	+/–1.41		pCi/g				
Promethium–144	U	–0.0329	+/–0.0306	0.050	+/–0.0306		pCi/g				
Promethium–146	U	–0.000319	+/–0.0352	0.0635	+/–0.0352		pCi/g				
Ruthenium–106	U	–0.00449	+/–0.261	0.463	+/–0.261		pCi/g				
Thorium–234	U	0.818	+/–0.905	1.22	+/–0.905		pCi/g				
Uranium–235	U	0.150	+/–0.239	0.295	+/–0.239	0.200	pCi/g				
Uranium–238	U	0.818	+/–0.905	1.22	+/–0.905	2.00	pCi/g				
Yttrium–88	U	0.0156	+/–0.0286	0.058	+/–0.0286		pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	0839	450398

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.

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Company : Bechtel Nevada
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Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: 053301–R3 Project: NEVA00101
Sample ID: 142418003 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch I

E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab–specific qualifier–please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

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Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	053301–R4	Project:	NEVA00101
Sample ID:	142418004	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	21–JUL–05		
Receive Date:	05–AUG–05		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid												
Actinium–228		1.77	+/–0.276	0.160	+/–0.276		pCi/g		JPH1	08/17/05	2147	450963 1
Americium–241	U	0.0322	+/–0.257	0.323	+/–0.257	0.200	pCi/g					
Antimony–125	U	–0.00516	+/–0.0635	0.112	+/–0.0635		pCi/g					
Cerium–144	U	0.130	+/–0.155	0.262	+/–0.155		pCi/g					
Cesium–134	X	0.123	+/–0.044	0.0601	+/–0.044	0.100	pCi/g					
Cesium–137	U	0.0305	+/–0.0324	0.0405	+/–0.0324	1.00	pCi/g					
Cobalt–60	U	0.0152	+/–0.0254	0.0471	+/–0.0254		pCi/g					
Europium–152		0.433	+/–0.119	0.126	+/–0.119		pCi/g					
Europium–154	U	–0.0406	+/–0.0865	0.146	+/–0.0865		pCi/g					
Europium–155	U	0.0491	+/–0.104	0.155	+/–0.104		pCi/g					
Lead–212		1.75	+/–0.181	0.0709	+/–0.181		pCi/g					
Potassium–40		28.4	+/–2.25	0.356	+/–2.25		pCi/g					
Promethium–144	U	–0.0161	+/–0.0249	0.0436	+/–0.0249		pCi/g					
Promethium–146	U	0.00262	+/–0.0307	0.0542	+/–0.0307		pCi/g					
Ruthenium–106	U	0.123	+/–0.243	0.400	+/–0.243		pCi/g					
Thorium–234		3.02	+/–2.36	2.48	+/–2.36		pCi/g					
Uranium–235	U	0.119	+/–0.190	0.289	+/–0.190	0.200	pCi/g					
Uranium–238		3.02	+/–2.36	2.48	+/–2.36	2.00	pCi/g					
Yttrium–88	U	–0.00112	+/–0.0202	0.0381	+/–0.0202		pCi/g					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	0839	450398

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.

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Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270
Mercury, Nevada 89023
Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: 053301-R4
Sample ID: 142418004
Project: NEVA00101
Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch N

E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier–please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

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Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	053301–R5	Project:	NEVA00101
Sample ID:	142418005	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	21–JUL–05		
Receive Date:	05–AUG–05		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch N
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Solid											
Actinium–228		1.79	+/–0.306	0.139	+/–0.306		pCi/g		JPH1 08/17/05	2148	450963 1
Americium–241	U	0.0651	+/–0.126	0.233	+/–0.126	0.200	pCi/g				
Antimony–125	U	0.00461	+/–0.0489	0.0914	+/–0.0489		pCi/g				
Cerium–144	U	0.0937	+/–0.123	0.218	+/–0.123		pCi/g				
Cesium–134	X	0.119	+/–0.0471	0.0529	+/–0.0471	0.100	pCi/g				
Cesium–137	U	–0.0187	+/–0.0206	0.0349	+/–0.0206	1.00	pCi/g				
Cobalt–60	U	0.0195	+/–0.0206	0.0399	+/–0.0206		pCi/g				
Europium–152	U	0.0944	+/–0.0886	0.0965	+/–0.0886		pCi/g				
Europium–154	U	0.0112	+/–0.0757	0.135	+/–0.0757		pCi/g				
Europium–155	X	0.132	+/–0.092	0.115	+/–0.092		pCi/g				
Lead–212		1.75	+/–0.172	0.0573	+/–0.172		pCi/g				
Potassium–40		29.5	+/–2.34	0.328	+/–2.34		pCi/g				
Promethium–144	U	0.00496	+/–0.0195	0.0351	+/–0.0195		pCi/g				
Promethium–146	U	0.0114	+/–0.0294	0.0427	+/–0.0294		pCi/g				
Ruthenium–106	U	–0.101	+/–0.174	0.303	+/–0.174		pCi/g				
Thorium–234	U	1.63	+/–1.57	1.74	+/–1.57		pCi/g				
Uranium–235	U	0.120	+/–0.118	0.226	+/–0.118	0.200	pCi/g				
Uranium–238	U	1.63	+/–1.57	1.74	+/–1.57	2.00	pCi/g				
Yttrium–88	U	0.00959	+/–0.0172	0.035	+/–0.0172		pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	0839	450398

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.

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Certificate of Analysis

Company: Bechtel Nevada
Address: Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: 053301-R5 Project: NEVA00101
Sample ID: 142418005 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch N

E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier–please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

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Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	053301–R6	Project:	NEVA00101
Sample ID:	142418006	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	21–JUL–05		
Receive Date:	05–AUG–05		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Solid											
Actinium–228		1.72	+/–0.197	0.145	+/–0.197		pCi/g		JPH1 08/17/05	2148	450963
Americium–241	U	–0.0117	+/–0.0841	0.167	+/–0.0841	0.200	pCi/g				
Antimony–125	U	0.00868	+/–0.0595	0.095	+/–0.0595		pCi/g				
Cerium–144	U	–0.0642	+/–0.133	0.218	+/–0.133		pCi/g				
Cesium–134	X	0.0684	+/–0.0457	0.0407	+/–0.0457	0.100	pCi/g				
Cesium–137	U	–0.0199	+/–0.0387	0.0384	+/–0.0387	1.00	pCi/g				
Cobalt–60	U	0.0245	+/–0.023	0.0443	+/–0.023		pCi/g				
Europium–152	U	0.0366	+/–0.0795	0.106	+/–0.0795		pCi/g				
Europium–154	U	–0.00661	+/–0.0763	0.135	+/–0.0763		pCi/g				
Europium–155	U	0.0955	+/–0.0821	0.112	+/–0.0821		pCi/g				
Lead–212		1.61	+/–0.0764	0.0585	+/–0.0768		pCi/g				
Potassium–40		28.7	+/–1.19	0.325	+/–1.20		pCi/g				
Promethium–144	U	–0.00788	+/–0.0216	0.0385	+/–0.0216		pCi/g				
Promethium–146	U	–0.00169	+/–0.0241	0.0433	+/–0.0241		pCi/g				
Ruthenium–106	U	0.0498	+/–0.184	0.343	+/–0.184		pCi/g				
Thorium–234	U	1.29	+/–1.08	1.37	+/–1.08		pCi/g				
Uranium–235	U	0.177	+/–0.178	0.229	+/–0.178	0.200	pCi/g				
Uranium–238	U	1.29	+/–1.08	1.37	+/–1.08	2.00	pCi/g				
Yttrium–88	U	–0.00237	+/–0.0256	0.0398	+/–0.0256		pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	0839	450398

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 – (843) 556–8171 – www.gel.com

Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: 053301–R6 Project: NEVA00101
Sample ID: 142418006 Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch I

E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab–specific qualifier–please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

Bechtel Nevada

ANALYTICAL LABORATORY

SERVICES REQUEST AND CHAIN OF CUSTODY RECORD

Page 2 of 2

PROJECT / CLIENT INFORMATION

Project: CAU 204 | BN Org#: B502

Charge Number: 5B08 AD50

Project Manager: JEFF SMITH

Phone: 5-7775 | Fax: 5-7761 | M/S: NTS306

REPORT & TURNAROUND INFORMATION

Send Report to: DAVID NACHT

Phone: 5-5577 | Fax: 5-7761 | M/S: NTS306

Turnaround: ( ) Standard – 14 days IH, 28 days Non-rad Env, 45 days Rad Env
( ) RUSH Preliminary by: _____ (IH)
__1 __2 __7 __14 (non-Rad Env)
__1 __7 ✔14 __28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 204 CAS 05-33-01

The samples submitted contain (check);
( ) **Hazardous** - *(list)* _____
( ) **Radioactive** - *(list)* _____
( ) **Unknown** contamination. If known, identify contaminants. This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) _____ (Non-Rad Env) V2518 (Rad Env)

Samples submitted are associated with a signed Project SOW. (X) YES ( ) NO

Analyses entered here agree with the SOW. (X) YES ( ) NO ( ) N/A

If not, identify the variation: _____

Subcontract Lab(s) used for this work: GEL

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres – Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: NAS-A-002 ISO-4
053301-RU1	7/21/05	1035	SOIL	1 EA	500 mL					✓
053301-RU2		1037								✓
053301-RU3		1039								✓
053301-RU4		1041								✓
053301-RU5		1043								✓
053301-RU6	↓	1045	↓	↓	↓					✓
LAST ITEM										

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	DATE / TIME	Received by (print)	Signature	DATE / TIME
Mike Floyd	/s/ Signature on file	7/27/05 1700	Reeter		
Reeter		7/27/05 09:10	Dudley EMC	/s/ Signature on file	7/27/05 09:10
Dudley EMC	/s/ Signature on file	7/28/05 16:30	Reeter		
Reeter		8/4/05 0932	[illegible]	/s/ Signature on file	8/4/05 0932
Mike Floyd	/s/ Signature on file	8/4/05 0939	C.D. CASTANEDA	/s/ Signature on file	8/4/05 @ 0939
CD CASTANEDA	/s/ Signature on file	8/4/05 @ 1300	Fed Ex # 790000338131		8/4/05 @ 1300

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

CG 0056 nol

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 – (843) 556–8171 – www.gel.com

Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	053301–RU1	Project:	NEVA00101
Sample ID:	142418007	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	21–JUL–05		
Receive Date:	05–AUG–05		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	N
Rad Alpha Spec Analysis													
Alphaspec U, Solid													
Uranium–233/234		1.36	+/–0.155	0.0349	+/–0.223	0.020	pCi/g		BJB1	08/18/05	2129	451944	1
Uranium–235/236		0.119	+/–0.0531	0.0432	+/–0.0549	0.020	pCi/g						
Uranium–238		2.59	+/–0.214	0.0349	+/–0.372	0.020	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL–RAD–A–021B	B J1	08/11/05	0613	450772
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	1054	450771

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL–300, U–02–RC Modified

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
Uranium–232	Alphaspec U, Solid	36	(25%–125%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab–specific qualifier–please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	053301-RU2	Project:	NEVA00101
Sample ID:	142418008	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	21-JUL-05		
Receive Date:	05-AUG-05		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch
Rad Alpha Spec Analysis											
Alphaspec U, Solid											
Uranium-233/234		1.82	+/-0.129	0.0227	+/-0.221	0.020	pCi/g		BJB1 08/18/05	2129	451944 1
Uranium-235/236		0.197	+/-0.0478	0.0224	+/-0.0516	0.020	pCi/g				
Uranium-238		4.13	+/-0.194	0.0262	+/-0.453	0.020	pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL-RAD-A-021B	B J1	08/11/05	0613	450772
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	B J1	08/10/05	1054	450771

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, U-02-RC Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Uranium-232	Alphaspec U, Solid	56	(25%-125%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 – (843) 556–8171 – www.gel.com

Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270

Mercury, Nevada 89023 Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	053301–RU3	Project:	NEVA00101
Sample ID:	142418009	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	21–JUL–05		
Receive Date:	05–AUG–05		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch N
Rad Alpha Spec Analysis												
Alphaspec U, Solid												
Uranium–233/234		0.729	+/–0.0946	0.00959	+/–0.122	0.020	pCi/g		BJB1	08/18/05	2129	451944 1
Uranium–235/236		0.0593	+/–0.030	0.0119	+/–0.0306	0.020	pCi/g					
Uranium–238		0.853	+/–0.103	0.0306	+/–0.137	0.020	pCi/g					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL–RAD–A–021B	B J1	08/11/05	0613	450772
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	1054	450771

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL–300, U–02–RC Modified

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
Uranium–232	Alphaspec U, Solid	41	(25%–125%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab–specific qualifier–please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 – (843) 556–8171 – www.gel.com

Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270
Mercury, Nevada 89023
Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	053301–RU4	Project:	NEVA00101
Sample ID:	142418010	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	21–JUL–05		
Receive Date:	05–AUG–05		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch N
Rad Alpha Spec Analysis											
Alphaspec U, Solid											
Uranium–233/234		1.21	+/–0.135	0.0118	+/–0.194	0.020	pCi/g		BJB1 08/19/05	2018	451944 1
Uranium–235/236		0.107	+/–0.0447	0.0146	+/–0.0464	0.020	pCi/g				
Uranium–238		2.89	+/–0.209	0.0301	+/–0.392	0.020	pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL–RAD–A–021B	B J1	08/11/05	0613	450772
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	1054	450771

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL–300, U–02–RC Modified

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
Uranium–232	Alphaspec U, Solid	33	(25%–125%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab–specific qualifier–please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 – (843) 556–8171 – www.gel.com

Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270
Mercury, Nevada 89023
Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID: 053301–RU5
Sample ID: 142418011
Matrix: Soil
Collect Date: 21–JUL–05
Receive Date: 05–AUG–05
Collector: Client

Project: NEVA00101
Client ID: NEVA002

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	N
Rad Alpha Spec Analysis													
Alphaspec U, Solid													
Uranium–233/234		1.20	+/–0.131	0.0403	+/–0.185	0.020	pCi/g		BJB1	08/18/05	2129	451944	1
Uranium–235/236		0.194	+/–0.0579	0.0135	+/–0.0617	0.020	pCi/g						
Uranium–238		1.86	+/–0.162	0.0279	+/–0.260	0.020	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL–RAD–A–021B	B J1	08/11/05	0613	450772
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	1054	450771

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL–300, U–02–RC Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Uranium–232	Alphaspec U, Solid	37	(25%–125%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab–specific qualifier–please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 – (843) 556–8171 – www.gel.com

Certificate of Analysis

Company : Bechtel Nevada
Address : Warehouse 160, NTS 270
Mercury, Nevada 89023
Report Date: August 24, 2005
Contact: Mr. Theodore Redding
Project: Environmental Rad Analysis

Client Sample ID:	053301–RU6	Project:	NEVA00101
Sample ID:	142418012	Client ID:	NEVA002
Matrix:	Soil		
Collect Date:	21–JUL–05		
Receive Date:	05–AUG–05		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch I
Rad Alpha Spec Analysis											
Alphaspec U, Solid											
Uranium–233/234		1.17	+/–0.118	0.00934	+/–0.170	0.020	pCi/g		BJB1	08/18/05 2129	451944 1
Uranium–235/236		0.131	+/–0.0465	0.0368	+/–0.0485	0.020	pCi/g				
Uranium–238		2.32	+/–0.167	0.0238	+/–0.294	0.020	pCi/g				

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Ash Soil Prep	Ash Soil Prep, GL–RAD–A–021B	B J1	08/11/05	0613	450772
Dry Soil Prep	Dry Soil Prep GL–RAD–A–021	B J1	08/10/05	1054	450771

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL–300, U–02–RC Modified

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
Uranium–232	Alphaspec U, Solid	42	(25%–125%)

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
B Target analyte was detected in the sample as well as the associated blank.
BD Results below the MDC or low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value.
U Target analyte was analyzed for but not detected above the MDL or LOD.
UI Uncertain identification for gamma spectroscopy.
X Lab–specific qualifier–please see case narrative, data summary package or contact your project manager for details.
d The 2:1 depletion requirement was not met for this sample
h Sample preparation or preservation holding time exceeded.
The above sample is reported on a dry weight basis.

0507L061

Bechtel Nevada

ANALYTICAL LABORATORY

SERVICES REQUEST AND CHAIN OF CUSTODY RECORD

Page ____ of ____

PROJECT / CLIENT INFORMATION

Project: CAU 204 | BN Org#: 502

Charge Number: 5868 ADSS

Project Manager: Seff Smith

Phone: ~~5-6~~ 5-7726 | Fax: 5-7761 | M/S: NTS 306

REPORT & TURNAROUND INFORMATION

Send Report to: DAVE NACHT

Phone: | Fax: | M/S:

Turnaround: ( ) Standard – 14 days IH, 28 days Non-rad Env, 45 days Rad Env
( ) RUSH Preliminary by: _____ (IH)
___1 ___2 X 7 ___14 (non-Rad Env)
___1 ___7 ___14 ___28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAS 05-33-01

The samples submitted contain (check):
(X) **Hazardous** - *(list)* Lead
( ) **Radioactive** - *(list)* _____
( ) **Unknown** contamination. If known, identify contaminants. This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) V2516 (Non-Rad Env) _____ (Rad Env)

Samples submitted are associated with a signed Project SOW. (X) YES ( ) NO

Analyses entered here agree with the SOW. (X) YES ( ) NO ( ) N/A

If not, identify the variation: _____

Subcontract Lab(s) used for this work: LIONVILLE

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres – Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: Total Lead	9.9
053301-VL-1	7/25/05	1100	SOIL	1	250ml					X	
053301-VL-2		1105								X	
053301-VL-3		1110								X	
053301-VL-4		1115								X	
053301-VL-5		1120								X	
053301-VL-6		1125								X	
LAST ITEM											

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	DATE / TIME	Received by (print)	Signature	DATE / TIME
Mike Fiore	/s/ Signature on file	7/27/05 1700	Fed Ex	NA	7/27/05 1700
Fed Ex	NA	7/27/05 0940	Reed Poderis	/s/ Signature on file	7/27/05 940
Reed Poderis	/s/ Signature on file	7/27/05 943	C.J. CASTANEDA	/s/ Signature on file	7/27/05 @ 0943
C.J. CASTANEDA	/s/ Signature on file	7/27/05 @ 1300	Fed Ex #	790099143178	7/27/05 @ 1300
Fed Ex		7/28/05 0935	VICTOR HERNANDEZ	/s/ Signature on file	7/28/05 @ 0935

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

LIONVILLE LABORATORY INC.

Analytical Report

Client : BECHTEL NEVADA V2516
LVL# : 0507L061

W.O.# : 60052-001-001-0001-00
Date Received : 07-28-05

SW846 METALS

1. This narrative covers the analyses of 6 soil samples.

2. The samples were prepared and analyzed in accordance with SW-846 protocol and reported with a CLP deliverable.

3. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory and High Purity.

4. All analyses were performed within the required holding times.

5. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

6. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within control limits.

7. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within method criteria.

8. The preparation/method blank was within method criteria. Refer to form 3.

9. All ICP Interference Check Standards were within control limits. Refer to form 4.

10. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to form 7.

11. The serial dilution percent difference was within SW-846 control limits. Refer to form 9.

12. All matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the 75-125% control limits. Refer to form 5A.

13. The duplicate analysis was outside the 20% Relative Percent Difference (RPD) control limits. Refer to form 6.

14. All sample IDs were changed to accommodate the EPA naming convention which allows a maximum of 6 characters on all CLP Forms. Refer to the comments section of form 1 for the original ID.

15. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

/s/ Signature on file

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/8/05
Date

gmb\m07-061

LVLI
LIONVILLE LABORATORY INC.

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

B = Indicates that the parameter was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL)

Q QUALIFIERS

E = The reported value is estimated because of the presence of interference.

M = Duplicate injection precision not met.

N = Spiked sample recovery not within control limits.

S = The reported value was determined by the Method of Standard Additions (MSA).

W = Post Digestion spike for Furnace AA analysis is out of control limits (85 -115 %), while sample absorbance is less than 50% of spike absorbance.

* = Duplicate analysis not within control limits.

+ = Correlation coefficient for the MSA is less than 0.995.

ABBREVIATIONS

PB = Method or Preparation Blank.
S = Matrix Spike.
T = Matrix Spike Duplicate.
R or D = Sample Replicate

ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Flame AA.
4. Graphite Furnace AA.

U.S. EPA

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____

Lab Code: LVLI__ Case No.: NEVAD SAS No.: _____ SDG No.:V2516_

SOW No.: SW846

EPA Sample No.	Lab Sample ID
_301VL1_____	_0507L061-001___
_301VL1D____	_0507L061-001D__
_301VL1T____	_0507L061-001T__
_301VL1S____	_0507L061-001S__
_301VL2_____	_0507L061-002___
_301VL3_____	_0507L061-003___
_301VL4_____	_0507L061-004___
_301VL5_____	_0507L061-005___
_301VL6_____	_0507L061-006___
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

_____

_____

_____

_____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: /s/ Signature on file Name: IAIN DANIELS

Date: 8/8/05 Title: LABORATORY MANAGER

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

301VL1

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: NEVAD SAS No.: _____ SDG No.: V2516_
Matrix (soil/water): SOIL_ Lab Sample ID: 0507L061-001
Level (low/med): LOW__ Date Received: 07/28/05
% Solids: _92.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	9.2		*	P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
053301-VL-1

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

301VL2

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: NEVAD SAS No.: _____ SDG No.: V2516_
Matrix (soil/water): SOIL_ Lab Sample ID: 0507L061-002
Level (low/med): LOW__ Date Received: 07/28/05
% Solids: _92.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	11.4		*	P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
053301-VL-2

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

301VL3

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: NEVAD SAS No.: _____ SDG No.: V2516_
Matrix (soil/water): SOIL_ Lab Sample ID: 0507L061-003
Level (low/med): LOW__ Date Received: 07/28/05
% Solids: _95.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	8.1		*	P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
053301-VL-3

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

301VL4

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: NEVAD SAS No.: _____ SDG No.: V2516_
Matrix (soil/water): SOIL_ Lab Sample ID: 0507L061-004
Level (low/med): LOW__ Date Received: 07/28/05
% Solids: _96.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	8.3		*	P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
053301-VL-4

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

301VL5

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: NEVAD SAS No.: _____ SDG No.: V2516_
Matrix (soil/water): SOIL_ Lab Sample ID: 0507L061-005
Level (low/med): LOW__ Date Received: 07/28/05
% Solids: _96.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	4.8		*	P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
053301-VL-5

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

301VL6

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: NEVAD SAS No.: _____ SDG No.: V2516_
Matrix (soil/water): SOIL_ Lab Sample ID: 0507L061-006
Level (low/med): LOW__ Date Received: 07/28/05
% Solids: _96.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	13.9		*	P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
053301-VL-6

APPENDIX C.

WASTE DISPOSITION DOCUMENTATION

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(4)

Bechtel Nevada

NTS Landfill Load Verification

(Waste definitions are available on page 2)

SWO USE (Circle One Area) AREA 23 6 (9) LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rolloffs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Mike FLOYD Phone Number: 5-6653

Location / Origin: CAU 204 CAS 05-99-02

Waste Category: (check one)		☐ Commercial	☑ Industrial	
Waste Type: (check one)	☑ NTS	☐ Putrescible	☑ FFACO-onsite	☐ WAC Exception
	☐ Non-Putrescible	☐ Asbestos Containing Material	☐ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Category: (check one)		☑ Environmental management	☐ Defense Projects	☐ YMP
Pollution Prevention Category: (check one)		☑ Clean-Up	☐ Routine	
Method of Characterization: (check one)		☑ Sampling & Analysis	☒ Process Knowledge	☐ Contents

Prohibited Waste at all three NTS landfills: Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste at the Area 9 U10c Landfill: Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Asphalt	☒ Metal	☑ Wood	☐ Soil	☐ Paper	☐ Rocks / unaltered geologic materials	☐ Empty containers
☐ Plastic	☐ Wire	☐ Cable	☐ Cloth	☐ Rubber (excluding tires)	☐ Insulation (non-Asbestosform)	☐ Demolition debris
☐ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)						☐ Cement & concrete

Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office waste ☐ Food Waste ☐ Animal Carcasses

☐ Asbestos: ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos	☐ Drained automobiles and military vehicles	☐ Solid fractions from sand/oil/water separators
☐ Light ballasts (contact SWO)	☐ Drained fuel filters (gas & diesel)	☐ Deconned Underground and Above Ground Tanks
☐ Hydrocarbons (contact SWO)	☐ Other _____	

Additional waste accepted at the Area 6 Hydrocarbon Landfill: ☐ Other _____

☐ Septic sludge	☐ Rags	☐ Drained fuel filters (gas & diesel)	☐ Crushed non-terne plated oil filters
☐ Plants	☐ Soil	☐ Sludge from sand/oil/water separators	☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: MSF *(If initialed, no radiological clearance is necessary.)*

The above mentioned waste was generated outside of a Controlled Wa… knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only … site. I have verified this through the waste characterization method ide… prohibited and allowable waste items.

Radiation Survey Release for Waste Disposal

RCT Initials: DSR

- ☑ This container/load is free of external radioactive contamination.
- ☐ This container/load is exempt from survey due to process knowledge and origin.
- ☐ This container/load is free of radioactive contamination based on radioanalysis.

SIGNATURE: /s/ Signature on file DATE: 7-26-05

BN-0646 (09/99)

Print Name: Mike FLOYD 7/6/05

Signature: /s/ Signature on file Date: 7/__/__

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 9,580 Signature of Certifier: /s/ Signature on file

Retention Code: ENV 6.b

BN-0918 (04/03)

1

Bechtel Nevada

NTS Landfill Load Verification

(Waste definitions are available on page 2)

SWO USE (Circle One Area) AREA 23 6 9 **LANDFILL**

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rolloffs, dump trucks, and other onsite disposal of materials.)

Waste Generator: BN ER Phone Number: 50847

Location / Origin: CAU 204 AS CGS 8/4/05

Waste Category: (check one)		☐ Commercial	☒ Industrial	
Waste Type: (check one)	☐ NTS	☐ Putrescible	☒ FFACO-onsite	☐ WAC Exception
	☐ Non-Putrescible	☒ Asbestos Containing Material	☐ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Category: (check one)		☒ Environmental management	☐ Defense Projects	
Pollution Prevention Category: (check one)		☒ Clean-Up	☐ Routine	
Method of Characterization: (check one)		☐ Sampling & Analysis	☒ Process Knowledge	☐ Contents

Prohibited Waste at all three NTS landfills: Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste at the Area 9 U10c Landfill: Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper	☐ Rocks / unaltered geologic materials	☐ Empty containers				
☐ Asphalt	☐ Metal	☐ Wood	☐ Soil	☐ Rubber (excluding tires)	☐ Demolition debris	
☐ Plastic	☐ Wire	☐ Cable	☐ Cloth	☐ Insulation (non-Asbestosform)	☐ Cement & concrete	

☐ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office waste ☐ Food Waste ☐ Animal Carcasses

☒ Asbestos: ☒ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: 1.5 cy

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos	☐ Drained automobiles and military vehicles	☐ Solid fractions from sand/oil/water separators
☐ Light ballasts (contact SWO)	☐ Drained fuel filters (gas & diesel)	☐ Deconned Underground and Above Ground
☐ Hydrocarbons (contact SWO)		☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge ☐ Rags	☐ Drained fuel filters (gas & diesel)	☐ Crushed non-terne plated oil filters
☐ Plants	☐ Sludge from sand/oil/water separators	☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: _____ *(If initialed, no radiological clearance is necessary.)*

The above mentioned waste was generated outside of a Controlled Waste Ma... knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those ... site. I have verified this through the waste characterization method identified ... prohibited and allowable waste items.

Print Name: Mike Elola

Signature: /s/ Signature on file Date: 8/2/05

Radiation Survey Release for Waste Disposal

RCT Initials

- ☒ This container/load is free of external radioactive contamination.
- ☐ This container/load is exempt from survey due to process knowledge and origin.
- ☐ This container/load is free of radioactive contamination based on radioanalysis.

SIGNATURE: /s/ Signature on file DATE: 8-2-05

BN-0646 (09/99)

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 500.00 Signature of Certifier: /s/ Signature on file

BN-0918 (09/00)

(1)

Bechtel Nevada — NTS Landfill Load Verification

(Waste definitions are available on page 2)

SWO USE (Circle One Area): AREA 23 6 LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rolloffs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Brian Konrad 4 mjs 10/12/05 Phone Number: 5-1240

Location / Origin: Area 5, CAU 205 Kay-Block house

Waste Category: (check one)		☐ Commercial	☒ Industrial	
Waste Type: (check one)	☒ NTS	☐ Putrescible	☒ FFACO-onsite	☐ WAC Exception
	☐ Non-Putrescible	☐ Asbestos Containing Material	☐ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Category: (check one)		☒ Environmental management	☐ Defense Projects	☐ YMP
Pollution Prevention Category: (check one)		☒ Clean-Up	☐ Routine	
Method of Characterization: (check one)		☒ Sampling & Analysis	☐ Process Knowledge	☐ Contents

Prohibited Wastes at all three NTS landfills: Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste at the Area 9 U10c Landfill: Sewage Sludge; Animal carcasses; Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Asphalt	☒ Metal	☐ Wood	☒ Soil	☐ Rubber (excluding tires)	☐ Empty containers
☒ Plastic	☐ Wire	☐ Cable	☒ Cloth	☐ Insulation (non-Asbestosform)	☐ Demolition debris
					☐ Cement & concrete

☐ Paper ☐ Rocks / unaltered geologic materials

☐ Manufactured Items; (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office waste ☐ Food Waste ☐ Animal Carcasses

☐ Asbestos: ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos	☐ Drained automobiles and military vehicles	☐ Solid fractions from sand/oil/water separators
☐ Light ballasts (contact SWO)	☐ Drained fuel filters (gas & diesel)	☐ Deconned Underground and Above Ground Tanks
☐ Hydrocarbons (contact SWO)	☐ Other _____	

Additional waste accepted at the Area 6 Hydrocarbon Landfill: ☐ Other _____

☐ Septic sludge	☐ Rags	☐ Drained fuel filters (gas & diesel)	☐ Crushed non-terne plated oil filters
☐ Plants	☐ Soil	☐ Sludge from sand/oil/water separators	☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: _____ *(If initialed, no radiological clearance is necessary.)*

The above mentioned waste was generated outside of a Controlled Waste knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only th site. I have verified this through the waste characterization method identi prohibited and allowable waste items.

Print Name: Brian Konrad

Signature: /s/ Signature on file Date: 10/10/05

Radiation Survey Release for Waste Disposal

RCT Initials

- This container/load is free of external radioactive contamination.
- This container/load is exempt from survey due to process knowledge and origin.
- This container/load is free of radioactive contamination based on radiological analysis.

SIGNATURE: /s/ Signature on file DATE: 10-10-05

BN-0646 (04/99)

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 20.00 Signature of Certifier: /s/ Signature on file

Retention Code: ENV 8.b

BN-0918 (04/04)

COPY

Bechtel Nevada

RADIOLOGICAL SURVEY REPORT – DATA

SURVEY # 05-ER-N05-023 Page 1 of 1

Location:	Purpose:	Comments:	Date/Time:
Area 5 CAU 204	Waste Removal and shipment to u10c	Exterior of Packages only.	10-10-05 1000

Instrument:	Serial #:	Cal Due:	Eff. in %: Alpha / Beta	BKG in dpm: Alpha / Beta	MDA in dpm: Alpha / Beta
Ludlum 3030	217606	12-21-05	37.1 / 51.0	0.1 / 68.1	10.0 / 65.3
Ludlum Mod 3	203922	5-18-06	N/A	N/A	N/A
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA

RWP # NA

Work Package # ENV-05_CAU-204-3148

RCT Name: Diana Anderson Signature: /s/ Signature on file

RCT Name: NA Signature: NA

RCT Name: NA Signature: NA

RCT Name: NA Signature: NA

Survey Point	Description/Comments	Removable dpm/100cm² Alpha	Removable dpm/100cm² Beta	Fixed + Removable dpm/100cm² Alpha	Fixed + Removable dpm/100cm² Beta	Gamma mrem/hr	Neutron mrem/hr	Total mrem/hr
1	Soil Bag # 05L202	<MDA	<MDA	NA	NA	<0.05	NA	0.05
2	Soil Bag # 05L201	<MDA	<MDA	NA	NA	<0.05	NA	0.05
3	Soil Bag # 05L200	<MDA	<MDA	NA	NA	<0.05	NA	0.05
4	Soil Bag # 05L203	<MDA	<MDA	NA	NA	<0.05	NA	0.05
5	B-25 Box # 14-1540 N/A 10-10-05	<MDA	<MDA	NA	NA	<0.05	NA	0.05
NA	NA	NA	NA		NA	NA		NA
NA	NA	NA	NA	NA	NA	NA	NA	NA

Reviewed By (Print): Allen Allshouse

Signature: /s/ Signature on file

Date: 10-10-05

Retention Code: ADM 1.21.3d

BN-1103A2 (05/04)

NO.256 P.2/2

DEC. 1.2005 3:10PM UTILITIES DEPARTMENT

APPENDIX D.

USE RESTRICTION INFORMATION

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CAU Use Restriction Information

CAU Number/Description: CAU 204, Storage Bunkers

Applicable CAS Numbers/Descriptions: CAS 01-34-01, Underground Inst. House Bunker

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

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

Northwest Corner:	N = 4,101,051.847	E = 580,644.150
Northeast Corner:	N = 4,101,051.842	E = 580,760.842
Southeast Corner:	N = 4,100,971.060	E = 580,761.270
Southwest Corner:	N = 4,100,971.487	E = 580,644.150

Survey Date: 08/30/2005 **Survey Method (GPS, etc):** GPS

Site Monitoring Requirements: Visual Inspections

Required Frequency (quarterly, annually?): Annually

If Monitoring Has Started, Indicate last Completion Date: Not Applicable

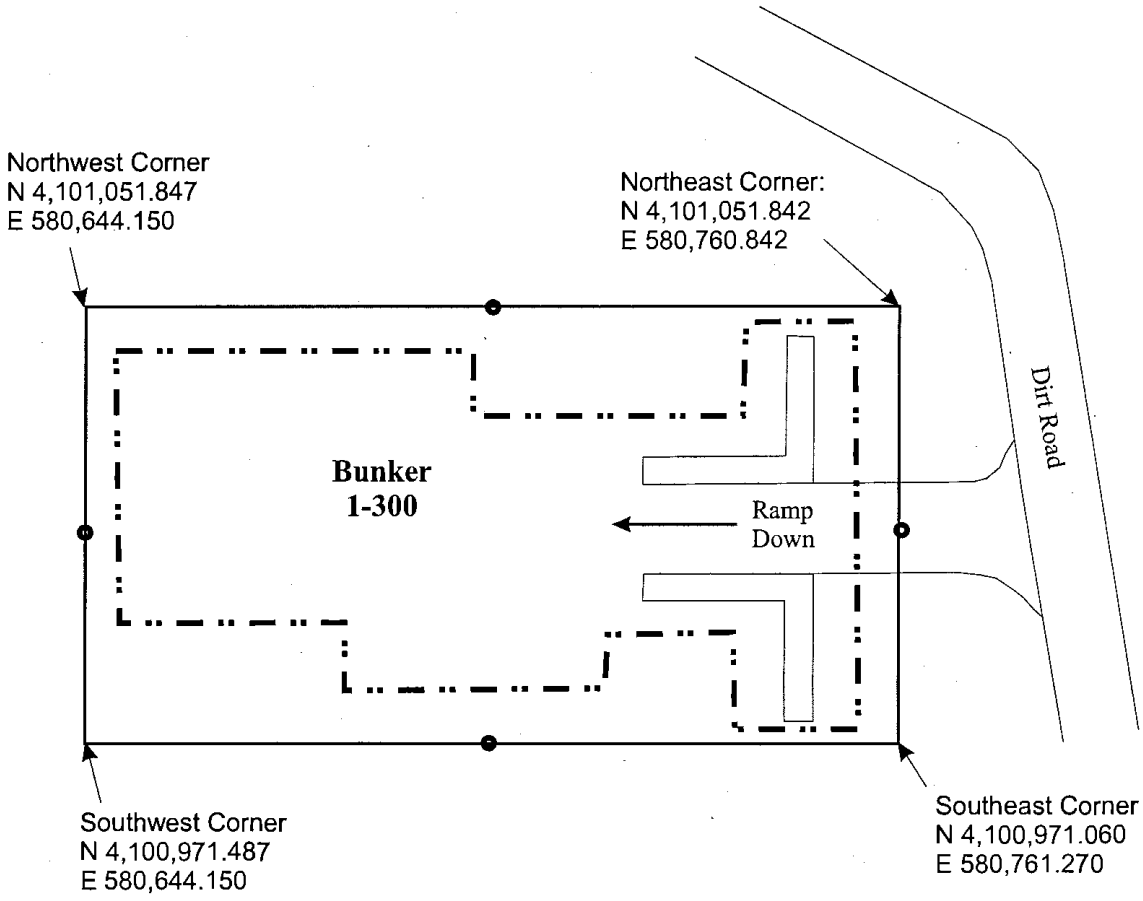
Use Restrictions

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 204 Closure Report for additional information on the condition of the site and any monitoring and/or inspection requirements.

Submitted By: /s/ Sabine Curtis **Date:** 3-30-06

Attachments: Site figure (CAS 01-34-01 Underground Inst. House Bunker Use Restriction Boundary) showing site survey locations and coordinates



LEGEND

- Use Restriction Boundary
- CAS 01-34-01 Footprint
- Use Restriction Sign

N

Not to Scale

CAS 01-34-01 UNDERGROUND INST. HOUSE BUNKER
USE RESTRICTION BOUNDARY

CAU Use Restriction Information

CAU Number/Description: CAU 204, Storage Bunkers

Applicable CAS Numbers/Descriptions: CAS 02-34-01, Instrument Bunker

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

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

Northwest Corner:	N = 4,110,497.843	E = 579,246.002
Northeast Corner:	N = 4,110,497.093	E = 579,324.195
Southeast Corner:	N = 4,110,436.388	E = 579,324.445
Southwest Corner:	N = 4,110,436.637	E = 579,245.752

Survey Date: 08/30/2005 **Survey Method (GPS, etc):** GPS

Site Monitoring Requirements: Visual Inspections

Required Frequency (quarterly, annually?): Annually

If Monitoring Has Started, Indicate last Completion Date: Not Applicable

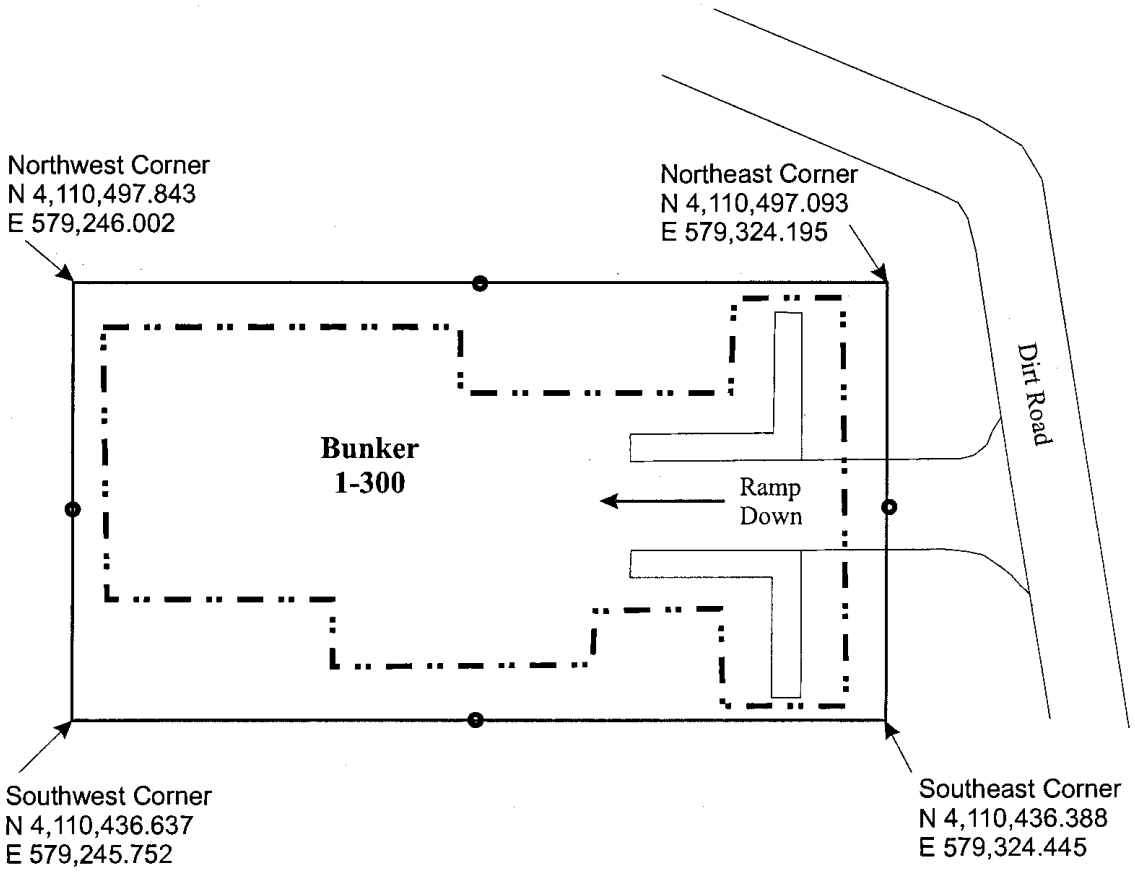
Use Restrictions

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 204 Closure Report for additional information on the condition of the site and any monitoring and/or inspection requirements.

Submitted By: /s/ Sabine Curtis **Date:** 3-30-06

Attachments: Site figure (CAS 02-34-01 Instrument Bunker Use Restriction Boundary) showing site survey locations and coordinates



LEGEND

- Use Restriction Boundary
- CAS 01-34-01 Footprint
- Use Restriction Sign

N

Not to Scale

CAS 02-34-01 INSTRUMENT BUNKER
USE RESTRICTION BOUNDARY

CAU Use Restriction Information

CAU Number/Description: CAU 204, Storage Bunkers

Applicable CAS Numbers/Descriptions: CAS 03-34-01, Underground Bunker

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

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

Northwest Corner:	N = 4,100,381.797	E = 586,087.023
Northeast Corner:	N = 4,100,381.098	E = 586,149.925
Southeast Corner:	N = 4,100,314.352	E = 586,149.575
Southwest Corner:	N = 4,100,314.003	E = 586,087.023

Survey Date: 08/30/2005 **Survey Method (GPS, etc):** GPS

Site Monitoring Requirements: Visual Inspections

Required Frequency (quarterly, annually?): Annually

If Monitoring Has Started, Indicate last Completion Date: Not Applicable

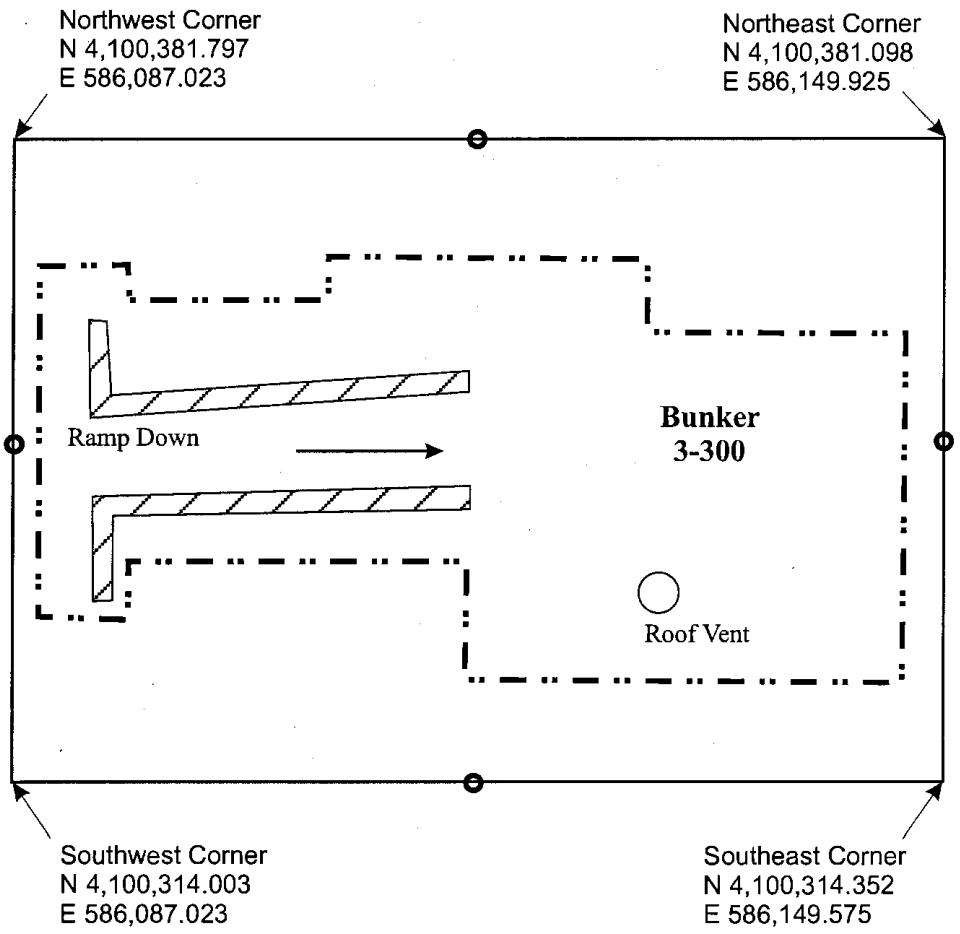
Use Restrictions

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 204 Closure Report for additional information on the condition of the site and any monitoring and/or inspection requirements.

Submitted By: /s/ Sabine Curtis **Date:** 3-30-06

Attachments: Site figure (CAS 03-34-01 Underground Bunker Use Restriction Boundary) showing site survey locations and coordinates



LEGEND

- Use Restriction Boundary
- CAS 03-34-01 Footprint
- Use Restriction Sign

N

Not to Scale

CAS 03-34-01 UNDERGROUND BUNKER
USE RESTRICTION BOUNDARY

CAU Use Restriction Information

CAU Number/Description: CAU 204, Storage Bunkers

Applicable CAS Numbers/Descriptions: CAS 05-18-02, Chemical Explosives Storage

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

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

Northwest Corner:	N = 4,077,427.009	E = 592,763.280
Northeast Corner:	N = 4,077,416.506	E = 592,799.998
Boundary Point 1:	N = 4,077,387.290	E = 592,791.960
Boundary Point 2:	N = 4,077,385.005	E = 592,800.582
Southeast Corner:	N = 4,077,291.602	E = 592,771.328
Southwest Corner:	N = 4,077,305.192	E = 592,728.560

Survey Date: 08/30/2005 **Survey Method (GPS, etc):** GPS

Site Monitoring Requirements: Visual Inspections

Required Frequency (quarterly, annually?): Annually

If Monitoring Has Started, Indicate last Completion Date: Not Applicable

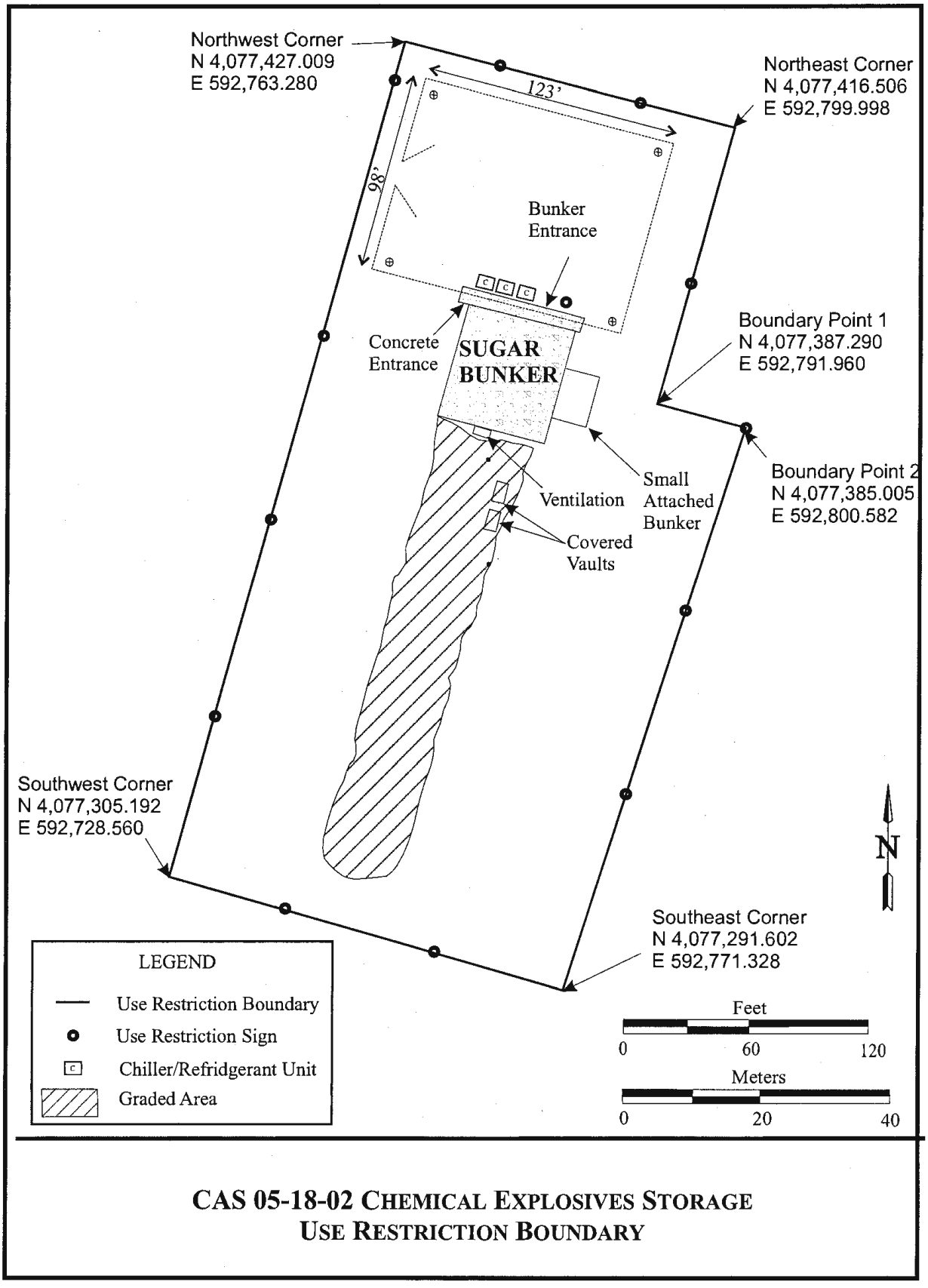
Use Restrictions

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 204 Closure Report for additional information on the condition of the site and any monitoring and/or inspection requirements.

Submitted By: /s/ Sabine Curtis **Date:** 3-30-06

Attachments: Site figure (CAS 05-18-02 Chemical Explosives Storage Use Restriction Boundary) showing site survey locations and coordinates



CAS 05-18-02 CHEMICAL EXPLOSIVES STORAGE
USE RESTRICTION BOUNDARY

CAU Use Restriction Information

CAU Number/Description: CAU 204, Storage Bunkers

Applicable CAS Numbers/Descriptions: CAS 05-33-01, Kay Blockhouse

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

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

Boundary Point 1:	N = 4,075,925.496	E = 592,290.815
Boundary Point 2:	N = 4,075,948.999	E = 592,327.984
Boundary Point 3:	N = 4,075,905.065	E = 592,385.206
Boundary Point 4:	N = 4,075,836.243	E = 592,394.397
Boundary Point 5:	N = 4,075,804.968	E = 592,376.162
Boundary Point 6:	N = 4,075,805.739	E = 592,333.586
Boundary Point 7:	N = 4,075,825.947	E = 592,291.202

Survey Date: 08/30/2005 **Survey Method (GPS, etc):** GPS

Site Monitoring Requirements: Visual Inspections

Required Frequency (quarterly, annually?): Annually

If Monitoring Has Started, Indicate last Completion Date: Not Applicable

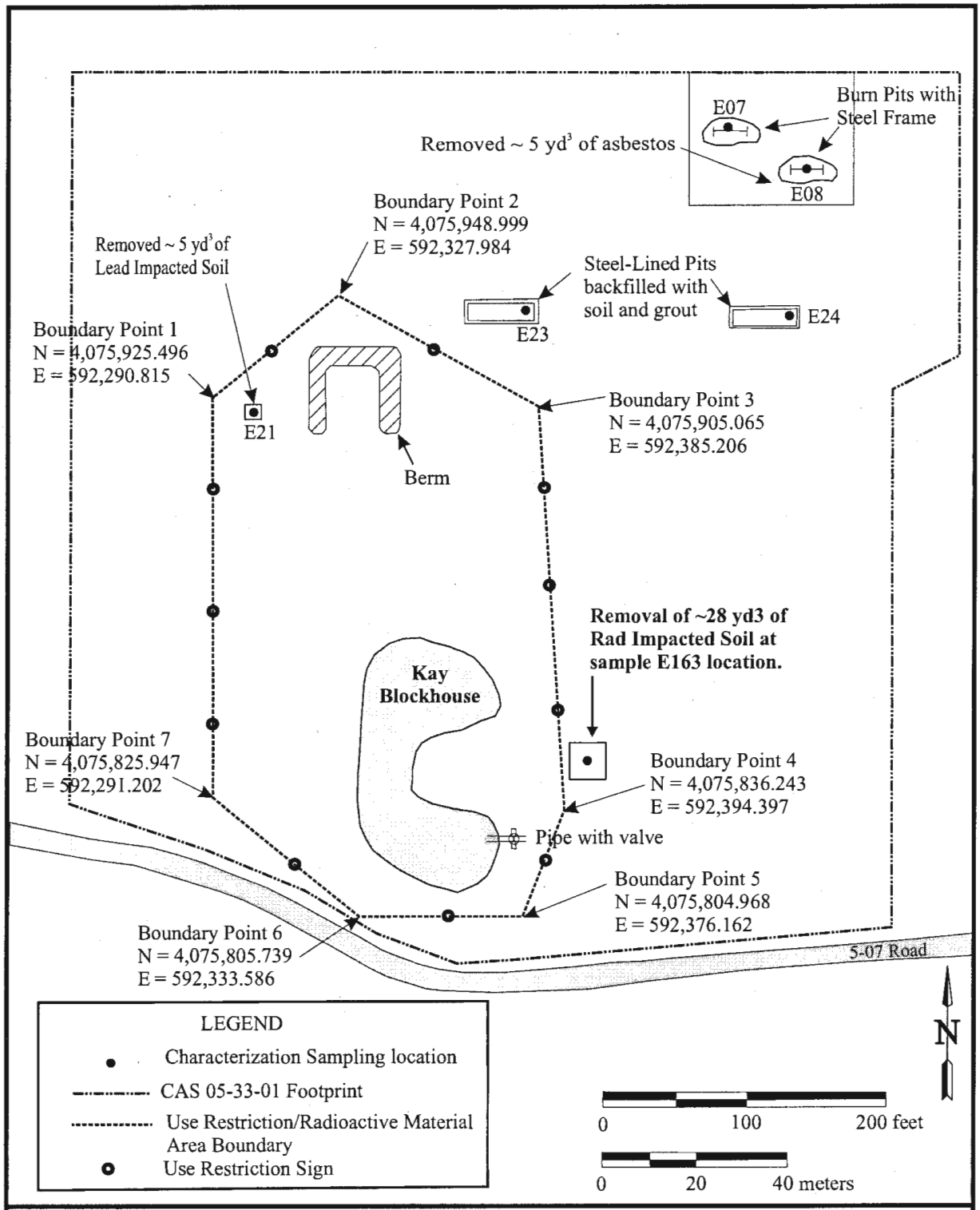
Use Restrictions

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 204 Closure Report for additional information on the condition of the site and any monitoring and/or inspection requirements.

Submitted By: /s/ Sabine Curtis **Date:** 3-30-06

Attachments: Site figure (CAS 05-33-01 Kay Blockhouse Use Restriction Boundary) showing site survey locations and coordinates



CAS 05-33-01 KAY BLOCKHOUSE USE RESTRICTION BOUNDARY

APPENDIX E.

SITE CLOSURE PHOTOGRAPHS

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PHOTOGRAPHIC LOG

PHOTOGRAPH NUMBER	DATE	CORRECTIVE ACTION SITE	DESCRIPTION
1	07/19/2005	01-34-01	Before closure activities
2	08/03/2005	01-34-01	After closure activities
3	07/19/2005	02-34-01	Before closure activities
4	08/03/2005	02-34-01	After closure activities
5	07/19/2005	03-34-01	Before closure activities
6	08/03/2005	03-34-01	After closure activities
7	07/19/2005	05-18-02	Before closure activities
8	08/03/2005	05-18-02	After closure activities
9	07/19/2005	05-33-01	Before closure activities
10	08/03/2005	05-33-01	After closure activities
11	07/19/2005	05-33-01	Before closure
12	08/03/2005	05-33-01	After closure activities
13	07/19/2005	05-99-02	Before closure activities
14	07/25/2005	05-99-02	After closure activities

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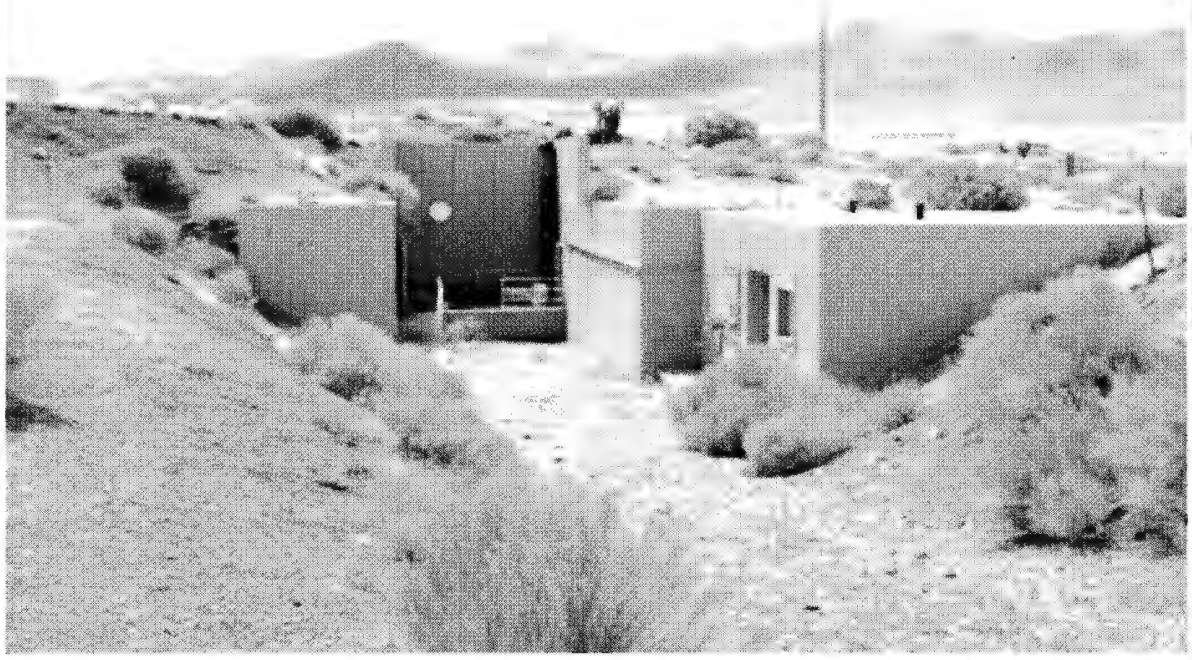
Photograph 1: CAS 01-34-01 entrance before closure. 07/19/2005

Photograph 2: CAS 01-34-01 entrance after closure. 08/03/2005

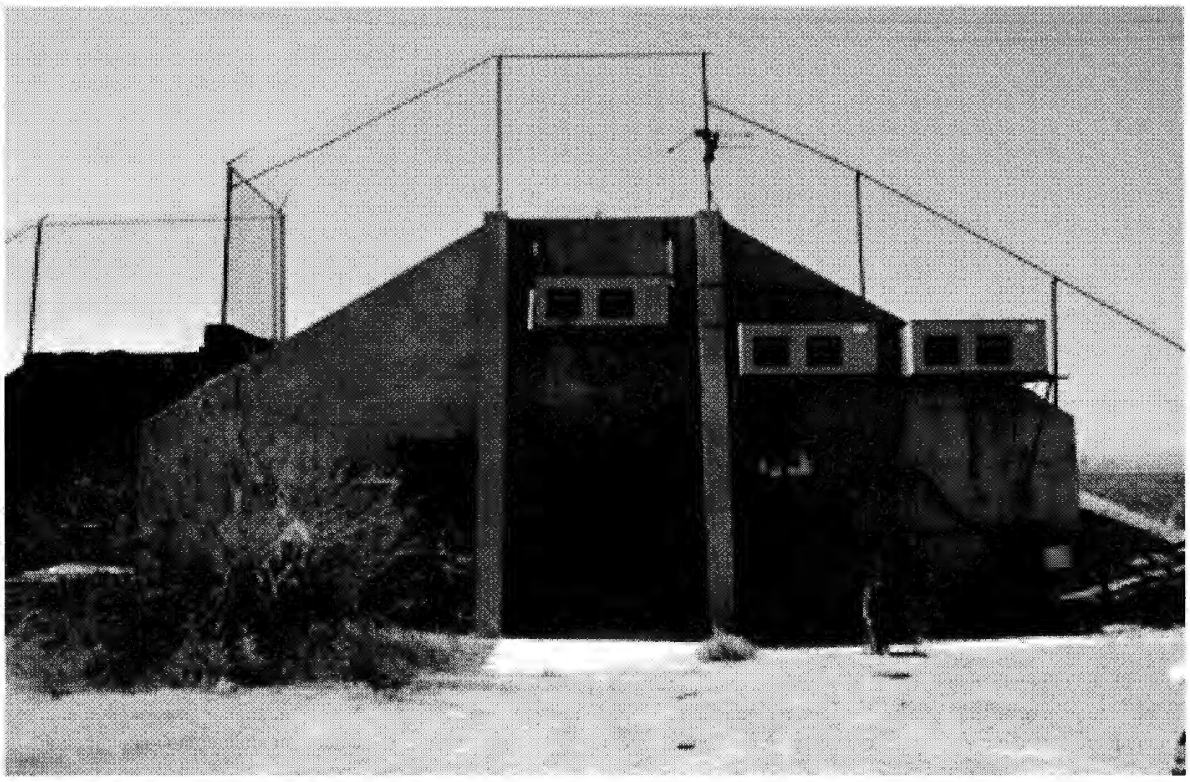


Photograph 3: CAS 02-34-01 entrance before closure. 07/19/2005

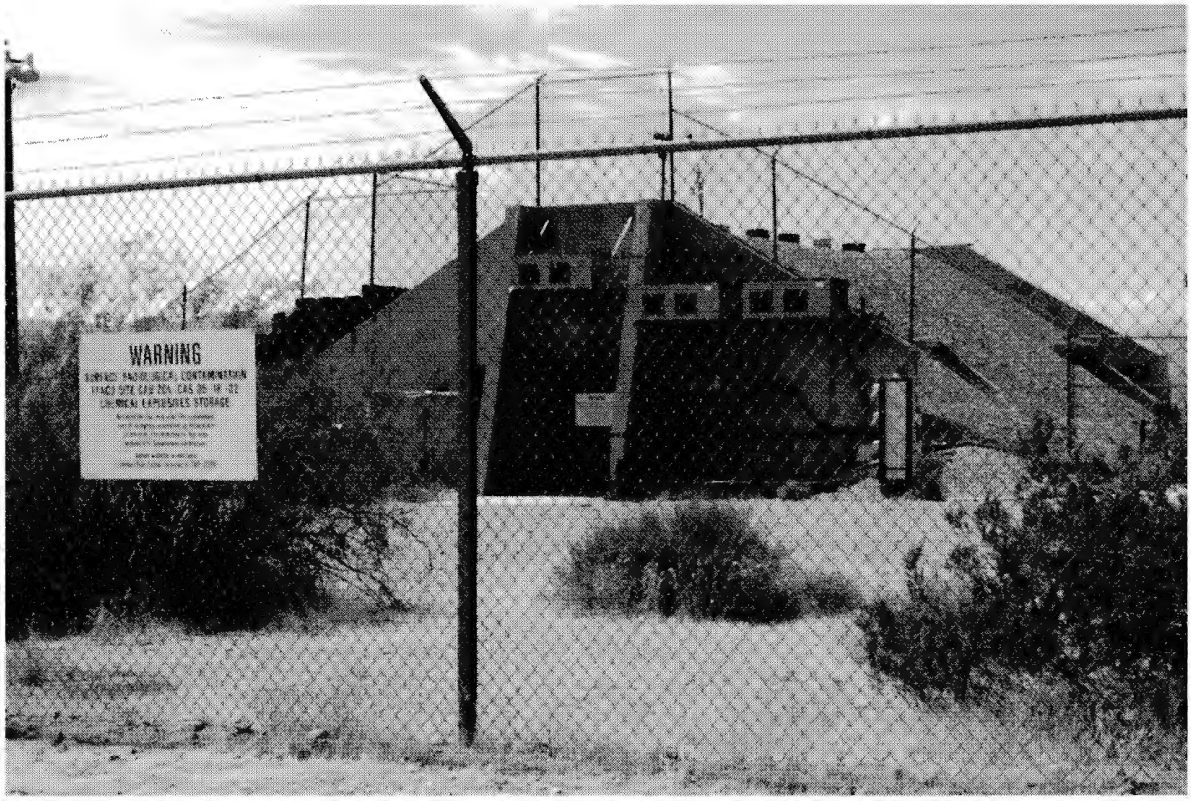
Photograph 4: CAS 02-34-01 entrance after closure. 08/03/2005

Photograph 5: CAS 03-34-01 entrance before closure. 07/19/2005

Photograph 6: CAS 03-34-01 entrance after closure. 08/03/2005

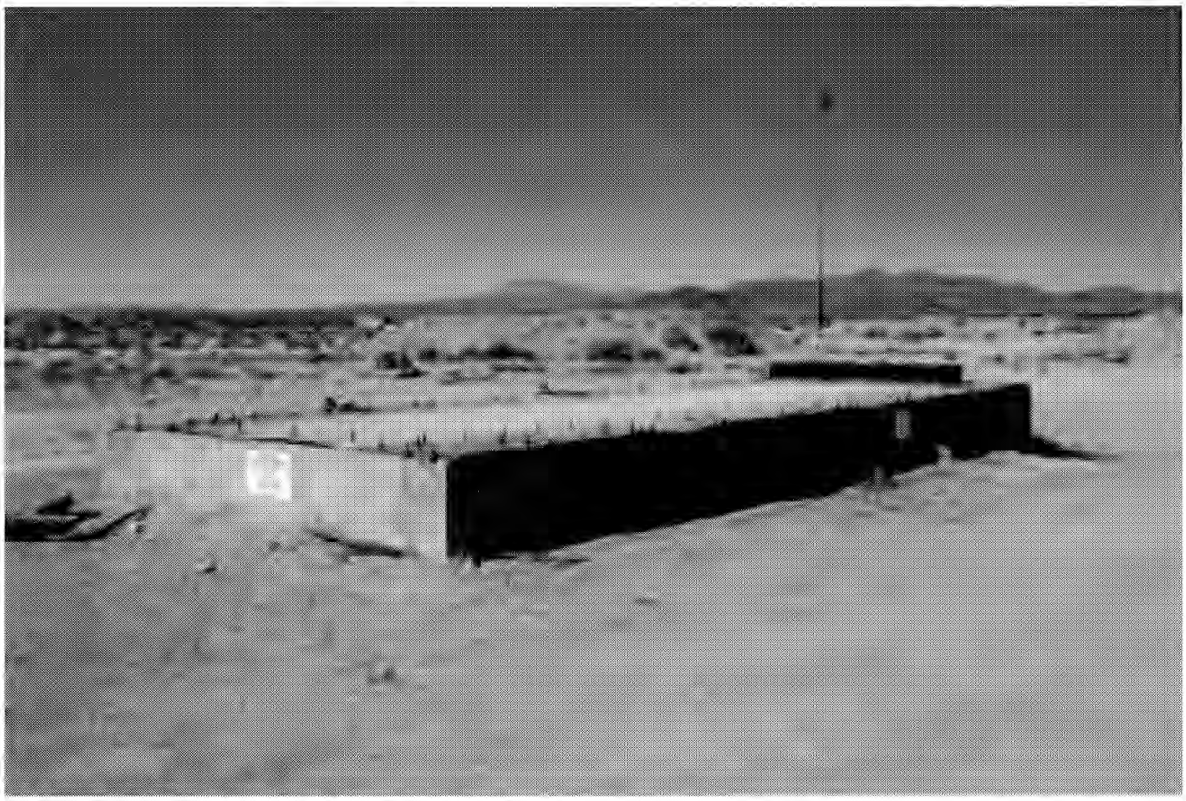


Photograph 7: CAS 05-18-02 entrance before closure. 07/19/2005



Photograph 8: CAS 05-18-02 entrance after closure. 08/03/2005

Photograph 9: CAS 05-33-01 Steel Burn Pit before closure. 07/19/2005



Photograph 10: CAS 05-33-01 Steel Burn Pit after closure. 08/03/2005

Photograph 11: CAS 05-33-01 Kay Blockhouse Bunker before closure. 07/19/2005

Photograph 12: CAS 05-33-01 Kay Blockhouse Bunker after closure. 08/03/2005

Photograph 13: CAS 05-99-02 Explosive Storage Bunker before closure. 07/19/2005

Photograph 14: CAS 05-99-02 Explosive Storage Bunker after closure. 07/25/2005

APPENDIX F.

NATIONAL ENVIRONMENTAL POLICY ACT CHECKLIST

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NV-16
(Rev. 11/2003)

Other Editions Obsolete

U.S. DEPARTMENT OF ENERGY
NATIONAL NUCLEAR SECURITY ADMINISTRATION NEVADA SITE OFFICE
NEPA ENVIRONMENTAL EVALUATION CHECKLIST

FOLLOW ATTACHED PROCEDURES FOR COMPLETING CHECKLIST	Date
A. Project/Activity Title (Attach a brief description of proposed project) **CAU 204: CLOSURE/CLEANUP ACTIVITIES**	**5/18/2005** Anticipated Start Date **6/6/2005**

Project Location	Proposed By (if other than NNSA/NSO)
NTS - AREA 1, 2, 3 AND 5	
NNSA/NSO Line Management Organization	NNSA/NSO Project/Program Manager **Janet Appenzeller-Wing**

ENVIRONMENTAL CONSIDERATIONS: If any phase of the project/activity involves any of the following considerations, check yes and explain in project description. See NV-16A for consideration guidelines and examples.

CONSIDERATION	YES	NO	UNK	CONSIDERATION	YES	NO	UNK
WASTE				**AIR EMISSIONS**			
1 Non-Rad Solid Waste	X			1 Biological Material/Chemical Release		X	
2 Hazardous Waste	X			2 Dust/Particulate Matter	X		
3 Low-level Rad Waste	X			3 Explosives		X	
4 Mixed Waste			X	4 Diesel Generators		X	
5 TRU/Mixed TRU Waste		X		5 Open Burning		X	
6 Wastewater (domestic/industrial)		X					
				SITE LOCATION/OTHER			
HAZARDOUS MATERIALS				1 Environmental Restoration Site (CAU)	X		
1 Petroleum/Fuel (storage/use)	X			2 Excavation/Land Surface Disturbance	X		
2 Underground Storage Tanks		X		3 Off road travel		X	
3 Aboveground Storage Tanks		X		4 Biological/Tortoise Resource Area	X		
4 PCBs/Asbestos	X			5 Cultural/Historic Resource Area	X		
5 Pesticides/Herbicides		X		6 Change in Existing Drainage Pattern		X	
6 Radioactive Materials	X			7 Impact to Environmental Monitoring System		X	
7 Biological Materials/Simulants		X		8 Unexploded Ordnance Area			X
8 Beryllium	X			9 Noise	X		
9 Chemical storage/use		X		10 Radiation controlled area	X		
10 Use of explosives/firearms		X		11 Drinking water system involvement		X	

DO NOT TYPE OR WRITE BELOW THIS LINE. FOR ESHD USE ONLY.

B. Is the project/activity included in the final NTS EIS and the ROD or other NEPA document?
Yes ___X___ (complete Sections C, D, and E) No _____ (complete Sections D, E, and F)

C. This project/activity is included in the NTS EIS/ROD (or other NEPA document) under the following section and page no.:
NTS/EIS, Volume 1, Appendix A, A.3.1.3- *Environmental Restoration Program – Industrial Sites Project*

D. Does the proposed project/activity require any local, state, or federal permits or notifications? Yes ___X___ No ___

E. If, based on the project description and the preliminary environmental considerations noted above, the proposed action fits within a class of action listed in Subpart D of 10 CFR 1021, write in the space below, the paragraph number and short title from the appropriate table of contents of Subpart D, Appendix B, C, or D, for a CX, EA, or EIS. If the proposed action does not fit within any class of action, write "Not Listed" below.

F. **NEPA COMPLIANCE OFFICER DETERMINATION OR RECOMMENDATION:**
I have determined that the proposed activity as described in item A above, has been adequately addressed in the document cited in item C for the purpose of NEPA. No further analysis or documentation is required pursuant to NEPA.

/s/ Signature on file
NNSA/NSO NEPA Compliance Officer

Deputy

05/19/05
Date

CAU 204: CLOSURE/CLEANUP ACTIVITIES

Project Description

Corrective Action Unit (CAU) 204 consists of six Corrective Action Sites (CASs), located in Areas 1, 2, 3 and 5 of the Nevada Test Site (NTS). CAU 204 sites will be closed by demolishing one wooden bunker, removing construction debris, excavating impacted soils, removing asbestos, backfilling and attaching steel plates over two steel-lined pits, securing bunker entrances, installing locks, installing two- and three-strand wire fencing, conducting radiological surveys, posting signs, and implementing use restrictions. Each CAS is briefly described below.

AREA 1

CAS 01-34-01, Underground Inst. House Bunker
Closure activities will include securing the entrance to the bunker to prevent unauthorized entrance. The entrance to the bunker will be closed and secured with a lock to restrict access. In addition, use restriction signs will be installed.

AREA 2

CAS 02-34-01, Instrument Bunker
Closure activities will include securing the entrance to the bunker to prevent unauthorized entrance. The entrance to the bunker will be closed and secured with a lock to restrict access. In addition, use restriction signs will be installed.

AREA 3

CAS 03-34-01, Underground Bunker
Closure activities will include securing the entrance to the bunker to prevent unauthorized entrance. The entrance to the bunker will be closed and secured with a lock to restrict access. In addition, use restriction signs will be installed.

AREA 5

CAS 05-18-02, Chemical Explosives Storage
The entrances to the bunker will be closed and secured with a lock to restrict access. A radiological survey will be conducted to expand the Radioactive Materials Area (RMA) currently surrounding a portion of the CAS to incorporate any surface radiological contamination above the NTS free release criteria detected during closure activities. After the extent of contamination has been determined, the identified areas of contamination will be fenced with additional T-posts and a three-strand wire fence and incorporated into the existing RMA. After the fence is constructed, the appropriate radiological control signage will be posted identifying the fenced areas as a RMA.

CAS 05-33-01, Kay Blockhouse
Two steel frames containing friable asbestos (non-rad) will be removed from the site. Two large, sunken, asbestos and steel-lined pits will be backfilled with soil and a concrete layer placed over the top of the soil, and steel plates will be attached over the top of the pits. Soil impacted with radionuclides in the southern portion of the CAS will be excavated. Lead-impacted soil from a small burn pit that is possibly mixed waste will be excavated. The entranceway to the bunker will be secured, a two-strand wire fence installed around the entire bunker, and warning signs posted. A small amount of soil that is possibly impacted with beryllium is located in front of the entrance to Kay Blockhouse. If this soil impedes the activities to secure the entrance to the bunker, it will be relocated a few feet away in order to perform work.

CAS 05-99-02, Waste Disposal Site
This site consists of a small bunker that was used to store conventional explosives and ammunition. The approved closure alternative is No Further Action, as no COCs were identified during site characterization. As a best management practice, the storage bunker will be demolished, the site will be cleared of debris, and any depressions created will be backfilled.

Environmental Considerations

Waste

1. **Non-Rad Solid Waste:** Non-Rad Solid Waste (e.g., non-impacted personal protective equipment and general trash) and construction debris (e.g., wood, concrete, metal, plastic) removed from sites will be screened for free release and disposed in an onsite landfill.

2. **Hazardous Waste:** Hazardous Waste will be generated at CAS 05-33-01 if sample analysis indicates that the lead-impacted soil excavated does not contain radionuclides above laboratory minimum detectable levels. The hazardous waste will be managed and disposed according to all applicable BN 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 appropriate offsite facility.

3. **Low-level Rad Waste:** Low-level Rad Waste will be generated at CAS 05-33-01 as excavated soil. All Low-Level Waste will be stored in a RMA, packaged in approved containers, and characterized. The waste will then be transported to an appropriate onsite disposal facility.

4. **Mixed Waste:** Mixed Waste may be generated at CAS 05-33-01 as a small amount of soil is to be excavated that is impacted with lead. This soil is also potentially radioactively contaminated, and if this is the case, it will be managed as mixed waste according to all applicable BN procedures and state and federal regulations.

Hazardous Materials

1. **Petroleum/Fuel (storage/use):** Heavy equipment on site will use petroleum fuel. No fuel will be stored on site outside of the equipment. Absorbent pads will be used if equipment appears to be leaking petroleum.

4. **Asbestos:** Asbestos will be removed from CAS 05-33-01. All workers performing abatement work shall comply with Company Manual CM-0444.001-012, Asbestos Management, and have the training specified in Section 7.0 of this manual.

6. **Radioactive Materials:** Soil at CAS 05-33-01 has been determined by characterization samples to be above the preliminary action levels for Thorium-234 and Uranium-238. This soil will be excavated, stored in a RMA, packaged in approved containers, and characterized. The waste will then be transported to an appropriate onsite disposal facility.

8. **Beryllium:** Beryllium is expected to be present at CAS 05-18-02 and CAS 05-33-01. Sugar Bunker and Kay Blockhouse are in legacy beryllium areas, and Industrial Hygiene will be contacted to provide guidance on how to minimize potential exposure to beryllium. This is in accordance with company procedure CM-0444.001-079, "Chronic Beryllium Disease Prevention".

Air Emissions

2. **Dust/Particulate Matter:** Dust/Particulate Matter will be controlled during soil excavation by the use of water sprays.

Site Location/Other

1. **Environmental Restoration Site:** These sites are included in the Federal Facility Agreement and Consent Order between the Department of Energy and the state of Nevada as part of Corrective Action Unit 204.

2. **Excavation/Land Surface Disturbance:** Excavation will occur at CAS 05-33-01 to remove impacted soil. Soil will be removed by using either a backhoe or front-end loader, and all excavations will be backfilled with clean fill from an approved borrow source and contoured to the surrounding grade.

4. **Biological/Tortoise Resource Area:** CASs in Area 5 are located in a Biological/Tortoise Resource Area. A biological pre-activity survey will be conducted prior to starting field activities at these sites.

5. **Cultural/Historic Resource Area:** The bunkers in CAS 01-34-01, CAS 02-34-01, CAS 03-34-01, CAS 05-18-02, and CAS 05-33-01 are of historical interest. A cultural survey of the site has been performed and determined that the approved closure activities will not affect the cultural significance of the site.

8. **Unexploded Ordnance Area:** UXO may be encountered at the sites in CAU 204. If UXO is encountered, the appropriate notifications will be made, and all BN procedures will be followed.

9. **Noise:** Elevated noise levels may result from the operation of backhoe and/or loader equipment. Personnel not directly involved with operation of this equipment will be kept back at least 15 feet while equipment is in use. The equipment operator will follow the instructions as directed in the Site Specific Health and Safety Plan.

10. **Radiation controlled area:** The CASs in CAU 204 are located in controlled areas, and work will be performed under the supervision of a radiological control technician as needed. An RWP will be obtained if required by Health Physics.

APPENDIX G

APPROVED RECORD OF TECHNICAL CHANGES

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RECORD OF TECHNICAL CHANGE

Technical Change No.: CAP-1

Page: 1 of 4

Project/Job No. Corrective Action Unit 204

Date APR 13 2005

Project/Job Name: Corrective Action Unit 204 / Corrective Action Plan

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

Alissa Tibesar	Bechtel Nevada Technical Lead
(Name)	(Title)

Description of Changes:

1. Page x, 3rd bullet. Replace Sentences 3 through 7 with the following:

   Two large, sunken, asbestos- and steel-lined pits containing friable asbestos between the steel liners and concrete walls are located north of the Kay Blockhouse. Soil located at the bottom of the pits is impacted with radionuclides, royal demolition explosives, and lead. Steel plates will be attached over the top of the pits. Approximately 535 m^3 (700 yd^3) of soil impacted with radionuclides in the southern portion of the CAS and 3 m^3 (4 yd^3) of lead-impacted soil from a small burn pit were identified during characterization. The impacted soil in these two areas will be excavated. The entranceway to the bunker will be repaired and closed, a lock installed, a double-strand wire fence installed around the entire bunker, and warning signs posted. A small amount of soil that is possibly impacted with beryllium may need to be relocated from in front of the door in order to close it.

2. Page 3, Table 1, Row 5 (CAS 05-33-01), Column 5. Delete Sentences 2, 5, 7, and 8 and add the following:

   Attach steel plates over the top of the asbestos- and steel-lined pits. Repair, close, and secure the existing wooden door.*

3. Page 3, Table 1. Replace asterisked footnote with the following:

   * A small amount of soil that is possibly impacted with beryllium may need to be relocated from in front of the door in order to close it.

4. Page 5, Section 2.1.2.1. Replace the 2nd sentence with the following:

   The bunker is located approximately 914 meters (m) (3,000 feet [ft]) from ground zero of the T-1 atmospheric test and consists of four rooms.

5. Page 8, Paragraph 1. Replace the 3rd and 4th sentences with the following:

   The entrance to the bunker will be closed and secured with a lock to restrict access.

6. Page 8, Section 2.1.2.2, Paragraph 3. Replace the 3rd and 4th sentences with the following:

   The entrance to the bunker will be closed and secured with a lock to restrict access.

7. Page 11, Paragraph 2. Replace the 3rd and 4th sentences with the following:

   The entrance to the bunker will be closed and secured with a lock to restrict access.

8. Page 13, Paragraph 2. Replace Sentences 1 through 6 with the following:

   The entrances to the smaller bunker and the main bunker will be closed and secured with a lock to restrict access.

9. Page 15, Paragraph 2. Replace Sentences 4 through 7 with the following:

   The two asbestos- and steel-lined pits (sample locations E23 and E24) will be covered by attaching steel plates over the top of each pit.

10. Page 15, Paragraph 2. Replace Sentences 12 through 14 with the following:

    Approximately 535 m^3 (700 yd^3) of soil encompassing sample locations E27, E34, E157, E161, and E163 were identified during characterization as being contaminated with U-238.

11. Page 15. Replace Paragraphs 3 and 4 with the following paragraph:

    The existing wooden door to the Kay Blockhouse is hanging on one hinge. The door will be repaired and closed, a hasp installed (if required), and a lock installed. A small amount of beryllium-impacted soil may need to be relocated from in front of the door in order to close it.

12. Page 16. Replace Paragraph 3 with the following paragraph:

    In addition to removing waste from the site, administrative controls will be implemented. This includes installing a double-strand wire fence around the bunker and underground structure and berm to the north (see Figure 7) and posting warning signs with contact information according to the FFACO use restriction posting guidance (FFACO, 2003). Once the site has been secured, a use restriction will be implemented to prevent future use of the site.

13. Page 17, Paragraph 5 ("Mixed Low-Level Waste"). Replace the 1st sentence with the following:

    The soil at CAS 05-33-01, Kay Blockhouse, from sample location E21 is impacted with lead and radionuclides (NNSA/NSO, 2004).

14. Page 17. Delete Paragraph 6 ("Beryllium-Impacted Soil").

15. Page 19, Section 2.4.2, Paragraph 1. Replace the 3rd sentence with the following:

    Additional activities among the five CASs include: conducting radiological surveys to appropriately locate RMA boundaries, removal of soil impacted with lead and radionuclides, removal of friable asbestos, and removal of construction debris from the sites.

16. Page 19, Paragraph 5 ("CAS 05-33-01"). Replace the last sentence with the following:

    There are four locations at this site where contaminated soil will be removed during site remediation.

17. Page 20, Paragraph 1. Replace the 2nd sentence with the following:

    After a portable XRF unit indicates that lead levels are below the PAL as described in Section 2.1.2, a minimum of five verification soil samples will be collected from the excavation.

18. Page 20. Replace Paragraph 2 with the following:

    No soil will be removed from sample locations E23 and E24 (Figure 7). Steel plates will be attached over the top of the pits, and closure will be confirmed by visual inspection and photographic documentation of the final condition of the two pits.

19. Page 20, Paragraph 3. Replace the 1st sentence with the following:

    At sample location E27 and extending past sample locations E34, E157, E161, and E163 (Figure 7), radionuclide-impacted soil will be removed.

20. Page 20. Replace Paragraph 4 with the following:

    Beryllium-impacted soil may need to be relocated from in front of the door to Kay Blockhouse in order to close the door to the bunker. Because no COCs are present at this location, no verification samples will be collected from this area.

21. Page 20, Paragraph 5. Remove the 1st, 4th, and 5th bullets, and replace the 3rd bullet with the following:

    U-238 concentrations are less than 63.2 pCi/g (NCRP, 1999).

22. Page 21, Table 2. Remove last three rows and ** footnote.

Justification:

Changes 1, 2, 9, 13, 15, 16, 18, 21, and 22 are needed because the waste located in the pits will be difficult to excavate safely and completely. Entry into the pits would be required to fully remove impacted material from the pits. It would be time-consuming and costly to fill the pits with soil. Therefore, it is proposed to instead attach steel plates over the top of each pit to mitigate environmental impacts due to exposure and migration of the waste.

Changes 1, 10, 17, and 19 are needed to account for the possibility that more contaminated soil may be identified during cleanup activities than what was estimated in the CADD. The proper notifications will still be made; however, an ROTC to the CAP will not be necessary if additional contaminated soil is removed from any of these locations.

Changes 1, 2, 3, 5-8, 11, 12, 14, and 20 are needed due to the historical significance of these bunkers. Due to the historical significance of the sites, the bunker doors will not be welded closed, and the wooden entranceway to the Kay Blockhouse (CAS 05-33-01) will not be demolished. Beryllium-impacted soil will not be disposed, but it will remain near its original location.

Change 4 is needed because CAS 01-34-01 is located near ground zero of the T-1 test, not the T-3 test.

Project/Job No.:
Project/Job Name: Corrective Action Unit 204 Corrective Action Plan

The project time will be unchanged by approximately 0 days.

Applicable Project-Specific Document(s): ***Corrective Action Plan for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada, Revision 0, September 2004, DOE/NV--1003.***

Approved By: /s/ Janet Appenzeller-Wing Date 4/6/05
NNSA/NSO Project Manager

/s/ Robert M. Bangerter, Jr. Date 4/7/05
NNSA/NSO Environmental Restoration Division Director

/s/ Don Elle Date 4/11/05
NDEP

RECORD OF TECHNICAL CHANGE

Technical Change No.: CAP-2 Page: 1 of 3

Project/Job No. Corrective Action Unit 204 Date July 15, 2005

Project/Job Name: Corrective Action Plan for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada

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

Alissa Silvas	Bechtel Nevada Technical Lead
(Name)	(Title)

Description of Changes: (This is the second ROTC to the CAU 204 CAP.)

1. Page x, 3rd Bullet. Replace Sentence 5 with the following:
(This also replaces Sentence 3 of Change # 1 of ROTC # CAP-1.)

> Approximately 107 m^3 (140 yd^3) of soil impacted with radionuclides in the southern portion of the CAS and 3 m^3 (4 yd^3) of lead-impacted soil from a small burn pit were identified during characterization.

2. Page 11, Section 2.1.2.4, Paragraph 3. Replace Sentences 2-6 with the following:

> The existing RMA will be expanded to include contamination within the CAS boundary. Radiological surveys will be conducted by radiological control technicians (RCTs) using handheld radiological meters, and the identified area(s) of contamination within the CAS boundary will be fenced with additional T-posts and incorporated into the existing RMA.

3. Page 13, Section 2.1.2.5, Paragraph 2. Replace Sentence 8 with the following:

> Soil near a pipe outfall location (E163) was identified by analytical sampling, with Uranium-238 (U-238) and Thorium-234 (Th-234) concentrations above the NDEP-approved revised PAL (NDEP, 2004, and NCRP, 1999).

4. Page 15, Paragraph 2. Replace Sentences 12 through 14 with the following:
(This also replaces Change # 10 of ROTC # CAP-1.)

> The CADD originally identified approximately 535 m^3 (700 yd^3) of soil contaminated with U-238 and Th-234. Based on the revised PAL of 105 pCi/g for a 25 mrem/yr dose, approximately 107 m^3 (140 yd^3) of soil will be removed from sample location E163. The NDEP has approved the use of revised radiological PALs based on a 25 mrem/yr dose (NDEP, 2004, and NCRP, 1999).

5. Page 19, Section 2.4.2, Paragraph 4 ("CAS 05-18-02"). Replace Sentence 3 with the following:

> Portable radiological screening equipment will be used to identify and bound the area of contamination located within the CAS boundary as presented in Section 2.1.2.4.

6. Page 20, Paragraph 3. Replace Sentence 1 with the following:
(This also replaces Change # 19 of ROTC # CAP-1.)

> At sample location E163 (Figure 7), radionuclide-impacted soil will be removed.

7. Page 20, Paragraph 3. Replace Sentence 3 with the following:

> A minimum of five verification samples will be collected from the bottom of the excavation and sent to a laboratory for isotopic uranium and gamma spectroscopy analyses (DOE, 1997).

8. Page 20, Paragraph 5, Bullet 3. Remove Bullets 1, 4, and 5, and replace Bullet 3 with the following:
(This also replaces Change # 21 of ROTC # CAP-1.)

- U-238 and Th-234 concentrations are less than 105 pCi/g (NCRP, 1999).

9. Page 21, Table 2. Replace Table 2 with the following:

CAS	COC	LOCATION*	MINIMUM NUMBER OF VERIFICATION SAMPLES	ANALYSIS METHOD
05-33-01: Kay Blockhouse	Total Lead	E21	5 Lead	RCRA Metals 6010[A]
	U-238	E163	5 U-238	Isotopic U HASL-300[B]
	Th-234	E163	5 Th-234	Gamma Spectroscopy HASL-300[B]

10. Page 29, References. Add the following reference:

Nevada Division of Environmental Protection, 2004. Review of Industrial Sites Project Document "Calculating Industrial Sites Project Remediation Goals for Radionuclides in Soil Using the Residual Radiation (RESRAD) Computer Code", Letter from Tim Murphy (Chief for the Bureau of Federal Facilities) to Robert Bangerter (Acting Director Environmental Restoration Division) dated November 19, Las Vegas, NV.

Justification:

Changes 1, 3, 4, and 6-10: The NDEP and the NNSA/NSO have agreed to use the radiological PALs based on a 25 mrem/yr dose rate for radioisotopes instead of a 15 mrem/yr dose rate (NDEP, 2004). Therefore, several of the impacted soil locations at CAS 05-33-01, Kay Blockhouse, no longer exceed the current PAL; therefore, less soil will be removed. A Record of Technical Change to the CADD using the revised PALs was submitted for approval. It recommends removing radiologically impacted soil at only the E163 sample location.

Changes 2 and 5: The CADD recommends expanding the RMA at CAS 05-18-02 to include contamination within the CAS boundary. Additional radiological contamination exists outside the CAS boundary from multiple sources throughout Area 5 of the NTS, and is not possible to determine a single source of contamination. Therefore, the RMA at CAS 05-18-02 will only be expanded to include contamination within the CAS boundary. The additional areas of contamination outside CAS 05-18-02 are currently on the list of areas to be posted by demarcation in the future.

The project time will be decreased by approximately 8 days.

Applicable Project-Specific Document(s): ***Corrective Action Plan for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada, Revision 0, September 2004, DOE/NV--1003.***

Approved By: /s/ Sabine Curits Date 7-15-05
NNSA/NSO Project Manager

/s/ Sabine Curtis Date 7-15-05
NNSA/NSO Environmental Restoration Division Director

/s/ Don Elle Date 7/15/05
NDEP

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