UNCONTROLLED

RECORD OF TECHNICAL CHANGE

Technical Change No. 1 Page 1 of 1

Project/Job No. WBS 104010915100 Date 3/1/01

Project/Job Name CAU 342, A23 Mercury Fire Training Pit Post-Closure Monitoring

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

Allison Urban — Task Manager

(Name) (Title)

The project time will be Unchanged).

Applicable Project-Specific Document(s): Closure Report for Corrective Action Unit 342; Area 23 Mercury Fire Training Pit, Nevada Test Site, Nevada, April 2000

Approved By: /s/ Janet Appenzeller-Wing Date 3/5/01

Janet Appenzeller-Wing, Project Manager
Industrial Sites Project

/s/ Runore Wycoff Date 3/5/01

Runore C. Wycoff, Division Director
Environmental Restoration Division

Client Notified Yes__ No__ Date

NDEP Concurrence Yes__ No__ Date 4/3/01 /s/ Michael McKinnon

Contract Change Order Required Yes__ No

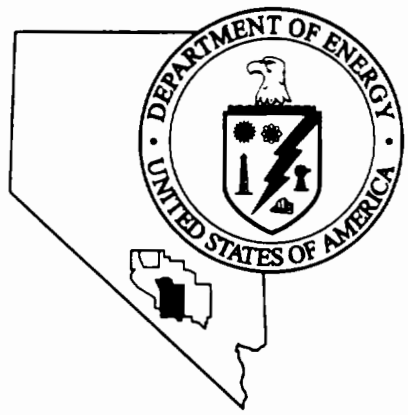
Contract Change Order No.

According to the post-closure plan, initial sampling of the site was to occur within 6 months of the completion of field activities. The initial sampling did not occur until 10 months after completion of field activities. This delay was caused by the unavailability of analytical laboratories that had been audited and by the unwillingness of analytical laboratories that were willing to be audited for the very small number of air samples that are required for this project. No other projects were collecting air samples for laboratory analysis at the time the sampling was to occur.

An analytical laboratory was identified, successfully audited, and contracted with (in conjunction with another project just getting started) in the fall of 2000, and samples were collected at that time.

Nevada
Environmental
Restoration
Project

DOE/NV-603



Closure Report for Corrective Action Unit 342: Area 23 Mercury Fire Training Pit Nevada Test Site, Nevada

Controlled Copy No.: UNCONTROLLED

Revision: 0

April 2000

Environmental Restoration
Division

U.S. Department of Energy
Nevada Operations Office

DISCLAIMER STATEMENT

AVAILABILITY STATEMENT

Available for sale to the public from:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161-0002
Telephone: 800-553-6847 or 703-605-6000
Fax: 703-605-6900
E-mail: orders@ntis.fedworld.gov
Online ordering: http://www.ntis.gov/ordering.htm

Available electronically at http://www.doe.gov/bridge

Available for a processing fee to U.S. Department of Energy and its contractors, in paper, from:

U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831-0062
Telephone: 865-576-8401
Fax: 865-576-5728
E-mail: reports@adonis.osti.gov

DOE/NV-603

CLOSURE REPORT
FOR CORRECTIVE ACTION UNIT 342:
AREA 23 MERCURY FIRE TRAINING PIT,
NEVADA TEST SITE, NEVADA

Controlled Copy No.: UNCONTROLLED

Revision 0

April 2000

Prepared for the U.S. Department of Energy
Nevada Operations Office
under Contract No. DE-AC08-96NV11718

THIS PAGE INTENTIONALLY LEFT BLANK

CLOSURE REPORT FOR CORRECTIVE ACTION UNIT 342: AREA 23 MERCURY FIRE TRAINING PIT, NEVADA TEST SITE, NEVADA

Approved by: /s/ Janet Appenzeller-Wing Date: 4/21/00
Janet L. Appenzeller-Wing, Project Manager
Industrial Sites Project

Approved by: /s/ Robert M. Bangerter, Jr. Date: 4/21/00
for Runore C. Wycoff, Division Director
Environmental Restoration Division

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

APPENDICES

FIGURES

TABLES

ACRONYMS AND ABBREVIATIONS

AST	Above Ground Storage Tank
BN	Bechtel Nevada
CADD	Corrective Action Decision Document
CAIP	Corrective Action Investigation Plan
CAP	Corrective Action Plan
CAS	Corrective Action Site
CAU	Corrective Action Unit
CR	Closure Report
cm	centimeter
DOE	U.S. Department of Energy
DOE/NV	U.S. Department of Energy, Nevada Operations Office
EPA	U.S. Environmental Protection Agency
FFACO	Federal Facility Agreement and Consent Order
ft	foot
gal	gallon
in	inch
L	liter
m	meter
m^3	cubic meter
mg/kg	milligram per kilogram

ACRONYMS AND ABBREVIATIONS (continued)

NDEP	Nevada Division of Environmental Protection
NTS	Nevada Test Site
SVOC	semi-volatile organic compound
VOC	volatile organic compound
yd^3	cubic yard

EXECUTIVE SUMMARY

The Mercury Fire Training Pit is a former fire training area located in Area 23 of the Nevada Test Site (NTS). The Mercury Fire Training Pit was used from approximately 1965 to the early 1990s and encompasses an area approximately 85 by 115 meters (m) (280 by 380 feet [ft]). The Mercury Fire Training Pit formerly included a bermed burn pit with four small burn tanks, four large above ground storage tanks (ASTs), an overturned bus, a telephone pole storage area, and areas for burning sheds, pallets, and cables. Monthly and weekly training events involved burning fuels including off-specification or rust-contaminated gasoline, diesel, and aviation fuel (JP-4), and other materials such as paint, tires, a pond liner, wood, paper, cloth, and copper cable.

Based on analytical results reported in the site characterization report, petroleum hydrocarbons were the only constituent of concern and were found beneath and downslope of the burn pit and AST areas, and beneath the telephone pole, burn shed, and overturned bus areas. In general, soil exceeding the petroleum hydrocarbon state action level (100 milligrams per kilogram [mg/kg]) was found at shallow depths (upper 1.5 m [5 ft]) in comparatively low concentrations (maximum of 4,100 mg/kg diesel at 0.3 m [1 ft] depth beneath the burn pit), and at greater depths in comparatively high concentrations (maximum of 18,000 mg/kg diesel at 7.6 m [25 ft] depth beneath the AST area).

The corrective action consisted of closure-in-place with partial excavation and disposal, administrative controls, and post-closure monitoring. Field activities began on October 25, 1999, with excavation of surficial soil (upper 0.3 m [1 ft]) and shallow soil (upper 1.5 m [5 ft]) that exceeded the state action level. Soil containing petroleum hydrocarbons at greater depths was left in place. Approximately 1,150 cubic meters (1,500 cubic yards) of hydrocarbon waste were hauled to the NTS Area 6 Hydrocarbon Landfill for disposal. On the return trips, the dump trucks hauled clean borrow soil to the site from a stockpile in Area 6. The borrow soil was backfilled and compacted into the excavations, creating a barrier to exposure from soil containing hydrocarbons left in place at greater depths. Backfilled areas were graded to a slight mound to promote surface drainage and minimize ponding. Excavation and backfilling activities were completed on November 3, 1999. On November 9 to 10, 1999, a soil gas vapor well was installed in the former AST area to facilitate collection of post-closure monitoring samples.

The Post-Closure Plan includes visual inspections of the site and monitoring of soil gas vapor. Site inspections will be performed biannually (once every six months) to verify the site is intact and use-restriction requirements are being followed. The soil gas vapor monitoring will be performed initially within six months after completion of field activities to establish baseline concentrations and then biennially (once every two years) to determine if natural attenuation is degrading the remaining petroleum hydrocarbons. The analytical results will be presented in a biennial report that will also include pertinent findings from the site inspections since the last report. After six years (initial baseline sampling event plus three biennial sampling events), the effectiveness of natural attenuation will be evaluated.

THIS PAGE INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

This Closure Report (CR) describes the remediation activities performed at the Mercury Fire Training Pit. The Mercury Fire Training Pit is a former fire training area located in Area 23 of the Nevada Test Site (NTS) (Figure 1). The Federal Facility Agreement and Consent Order (FFACO) of 1996 identifies the Mercury Fire Training Pit as Corrective Action Unit (CAU) 342 and Corrective Action Site (CAS) 23-56-01. Remediation of the CAU 342 is required under the FFACO of 1996.

1.1 PURPOSE

The purpose of this CR is to provide documentation of the completed corrective action and to provide data confirming the corrective action. The corrective action was performed following the approved Corrective Action Plan (CAP) (U.S. Department of Energy [DOE], 1999b) and consisted of closure-in-place with partial excavation, disposal, backfilling, administrative controls, and post-closure monitoring. Soil with petroleum hydrocarbon concentrations above the Nevada Division of Environmental Protection (NDEP) Action Level of 100 milligrams per kilogram (mg/kg) (Nevada Administrative Code, 1996) was removed to a depth of 1.5 meters (m) (5 feet [ft]). The excavations were backfilled with clean fill to restore the site and to prevent contact with deeper, closed-in-place soil that exceeded the NDEP Action Level.

According to the Corrective Action Investigation Plan (CAIP) (DOE, 1998), the Mercury Fire Training Pit was used from approximately 1965 to the early 1990s to train fire-fighting and emergency response personnel at the NTS and encompasses an area approximately 85 by 115 m (280 by 380 ft). The location of the Mercury Fire Training Pit is shown in Figure 1 and a site plan is shown in Figure 2.

The Mercury Fire Training Pit formerly included a bermed burn pit with four small burn tanks; four large above ground storage tanks (ASTs); an overturned bus, a telephone pole storage area; and several areas for burning sheds, pallets, and cables. During the active life of the Mercury Fire Training Pit, training events were conducted at least monthly and sometimes as often as weekly. Fuels burned during these events included off-specification or rust-contaminated gasoline, diesel, and aviation fuel (JP-4). Other items burned during these events included paint, tires, a pond liner, wood, paper, cloth, and copper cable.

Approximately 570 liters (L) (150 gallons [gal]) of fuel were used for each training event resulting in an approximate total of 136,000 L (36,000 gal) of fuel used over the life of the Mercury Fire Training Pit. Unburned fuel was allowed to pool on the ground and was left to eventually volatilize or soak into the soil. In addition, fuels from the ASTs and fuels and fluids from the overturned bus leaked or spilled onto the ground. Approximately 19 L to 38 L (5 to 10 gal) of paint were also burned monthly until sometime in the 1970s.

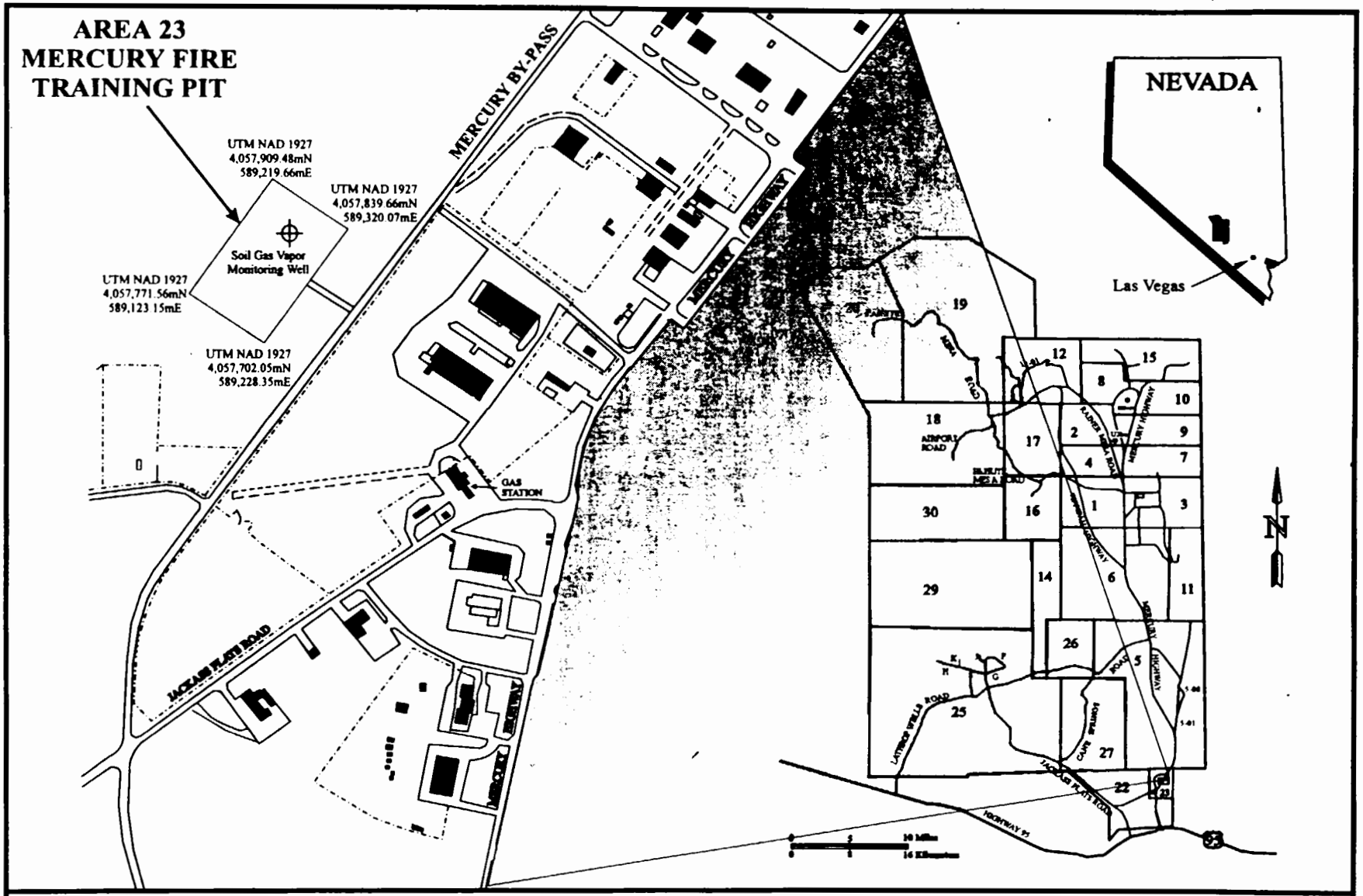


FIGURE 1
LOCATION OF CAU 342: AREA 23 MERCURY FIRE TRAINING PIT, NEVADA TEST SITE

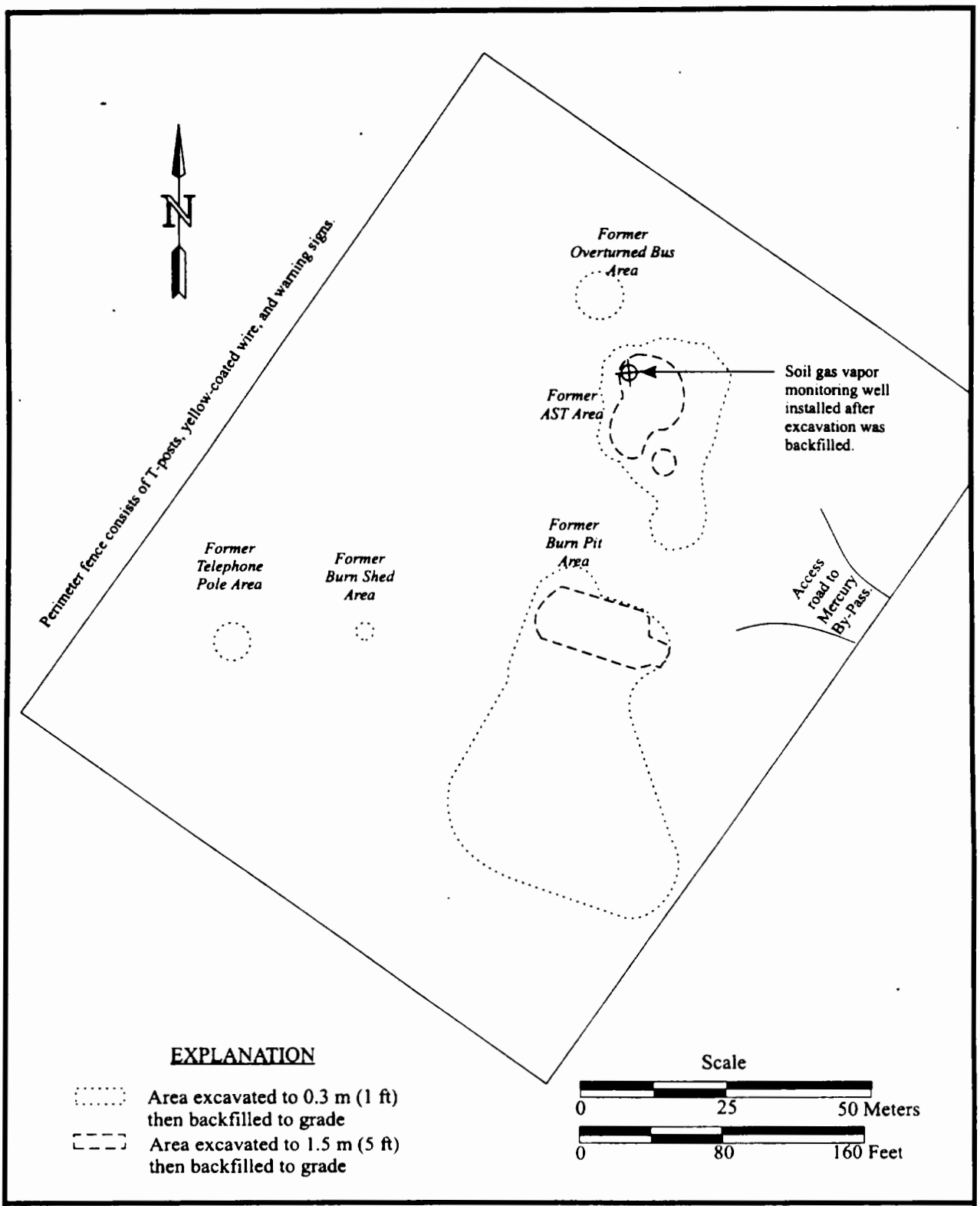


FIGURE 2
SITE PLAN OF CAU 342: AREA 23 MERCURY FIRE TRAINING PIT, SHOWING APPROXIMATE AREAS OF EXCAVATION

The following interim actions and initial site characterization were performed at the site in 1997 and 1998 and were reported in the CAIP (DOE, 1998):

- Sampling of telephone poles and of liquids in the ASTs.
- Removal of liquids from the ASTs.
- Steam cleaning of the tanks.
- Removal of all surface debris from the site.
- A passive soil gas survey was performed.

A final phase of site characterization was performed in May and June 1998, included collection and analysis of surface and near-surface soil samples, and was reported in the Corrective Action Decision Document (CADD) (DOE, 1999a). The CADD (DOE, 1999a) concluded that the concentrations in soil of gasoline, diesel, and unknown hydrocarbons exceeded the NDEP Action Level of 100 mg/kg in the following areas:

- Former AST Area - Hydrocarbon concentrations in the shallow soil (upper 1.5 m [5 ft]) beneath, and downslope of, the former AST area exceeded the NDEP Action Level with a maximum of 4,000 mg/kg diesel and unknown hydrocarbons at a depth of 0.3 m (1 ft). Elevated hydrocarbon concentrations extended to greater depths beneath the former AST area, reaching a maximum of 18,000 mg/kg diesel at a depth of 7.6 m (25 ft). The sample with 18,000 mg/kg diesel also contained 480 mg/kg xylene, which exceeded the U.S. Environmental Protection Agency (EPA) Region IX Preliminary Remediation Goal of 320 mg/kg (EPA, 1996).
- Former Burn Pit Area - Hydrocarbon concentrations in the shallow soil (upper 1.5 m [5 ft]) beneath, and downslope of, the former burn pit area exceeded the NDEP Action Level with a maximum of 4,100 mg/kg diesel at a depth of 0.3 m (1 ft). Elevated hydrocarbon concentrations extended to greater depths beneath the former burn pit area, reaching a maximum of 10,000 mg/kg unknown hydrocarbons at a depth of 3 m (10 ft) and 10,000 mg/kg diesel at a depth of 6 m (20 ft).
- Former Overturned Bus, Telephone Pole, and Burn Shed Areas - Surface soil (upper 0.3 m [1 ft]) in these three areas had concentrations as great as 1,400 mg/kg waste oil, 440 mg/kg unknown hydrocarbons, and 130 mg/kg unknown hydrocarbons, respectively.

1.2 SCOPE

The corrective action as implemented consisted of the following steps:

- Preplanning and site preparation, including preparation of all plans and permits, approval of a source of borrow material, delineation of excavation boundaries, and mobilization of equipment and personnel to the site.
- Excavation of surficial and shallow soil containing petroleum hydrocarbons to designated boundaries.
- Visual inspection and additional excavation beyond the designated boundaries, if needed.
- Hauling the excavated soil for disposal in the Area 6 Hydrocarbon Landfill.
- Hauling clean borrow material back to the site and backfilling the excavations in order to create a barrier to exposure from soil containing hydrocarbons left in place at greater depths.
- Grading of backfilled areas to promote surface drainage and prevent ponding.
- Restricting access and usage of the site by repairing perimeter fencing, installing warning signs, and enacting administrative use restrictions.
- Installing a soil gas vapor monitoring well and implementing a post-closure plan.

1.3 CLOSURE REPORT CONTENTS

This document is divided into the following sections in accordance with the approved FFACO Closure Report (CR) standardized outline:

- Section 1.0 - Introduction (purpose, scope, contents).
- Section 2.0 - Closure Activities (description, deviations, schedule, site plan).
- Section 3.0 - Waste Disposition (wastes encountered and their appropriate disposal).
- Section 4.0 - Closure Verification Results (verification activities, use restrictions).
- Section 5.0 - Conclusion (post-closure plan, closure recommendations).
- Section 6.0 - References.

The appendices of this document have been modified from the approved FFACO outline. The following FFACO outline appendices have not been included or revised as indicated below:

- Closure Certification - This appendix is not applicable for this site with closure-in-place.
- As-Built Documentation - This appendix is not applicable for this site as there are no engineered structures remaining except for the soil gas vapor monitoring well.
- Confirmation Sampling Test Results - This appendix is not applicable for this site as confirmation sampling was not planned or performed.
- Modifications to the Post-Closure Plan - This appendix is not applicable for this site as no changes have been made to the plan as described in CAP (DOE, 1999b).

The appendices included in this document are provided as follows:

- Appendix A: Waste Disposition Documentation.
- Appendix B: Use Restriction Information.
- Appendix C: Post-Closure Inspection Form.

2.0 CLOSURE ACTIVITIES

This section of the CR details the specific corrective action activities implemented and completed during the closure of CAU 342. This section also provides a detailed schedule of site activities as completed.

2.1 DESCRIPTION OF CORRECTIVE ACTION ACTIVITIES

2.1.1 Preplanning and Site Preparation

Several planning documents were prepared prior to beginning corrective action activities at CAU 342. These plans included the CAP (DOE, 1999b), Field Management Plan (Bechtel Nevada [BN], 1999a), Site Specific Health and Safety Plan (BN, 1999b), a construction work package, and an excavation permit. No above ground or underground utilities were determined to exist at the site. In addition, a National Environmental Policy Act checklist was prepared and a pre-activity site survey was performed by a biologist. The survey confirmed the absence of sensitive animal or plant species and the biologist concluded that desert tortoise clearance surveys would not be necessary. Planned excavation and drilling locations were marked. Surplus borrow material stockpiled at the Area 6 Decon Pond site was identified as a source of backfill. Site access was readily controlled because of the single entrance onto the site.

A Readiness Review meeting was conducted on October 20, 1999. Personnel and equipment were mobilized to the site beginning on October 21, 1999. On October 25, 1999, the pre-job briefing was held and field work began.

2.1.2 Partial Excavation of Hydrocarbon-Impacted Soil

Excavation of soil containing petroleum hydrocarbons above action levels to a depth of 1.5 m (5 ft) began on October 25, 1999, and ended on November 3, 1999. Five areas, shown in Figure 2, were excavated using either a backhoe or front-end loader to a depth of 0.3 m (1 ft): burn pit area, AST area, overturned bus area, telephone pole area, and burn shed area. A subarea within the burn pit area, and two subareas within the AST area, were excavated to a depth of 1.5 m (5 ft). After reaching planned lateral and vertical boundaries, as indicated in the CAP (DOE, 1999b), the excavations were visually inspected for staining by the Technical Lead to determine if further excavation was necessary. Several additional areas of stained soil were identified and excavated to a depth of 0.3 m (1 ft). Soil containing petroleum hydrocarbons at depths greater than 1.5 m (5 ft) was not removed. A water truck was used for dust suppression.

2.1.3 Hauling and Disposal of Waste

The excavated soil was loaded into end-dump trucks and covered with tarps for transport to the Area 6 Hydrocarbon Landfill. Loads were measured on a portable truck scale at the entrance to the Area 6 Hydrocarbon Landfill or at the permanent truck scale located at Gate 100. A total of 1,150 cubic meters (m^3) (1,500 cubic yards [yd^3]) of impacted soil were hauled to, and disposed in, the Area 6 Hydrocarbon Landfill. Based on process knowledge and analytical results from the site characterization, a Radiological Control Technician exempted the waste loads from radiological survey.

2.1.4 Hauling and Backfilling of Borrow Material

On the return trip from the Area 6 Hydrocarbon Landfill, the dump trucks were loaded with borrow soil that had been stockpiled at the Area 6 Decon Pond. A front-end loader was used to load the end-dump trucks and a water truck was used for dust suppression. The loads were covered by a tarp for transport to the Mercury Fire Training Pit where the borrow material was placed as backfilled. Backfill was placed in 0.2-m (8-inch [in]) lifts and wheel-compacted using the front-end loader. Where access was restricted, soil was compacted with downward blows of the backhoe bucket until wheel compaction was possible. All excavations were backfilled, compacted, and mounded slightly above grade to minimize ponding of surface water. The clean backfill created a barrier to exposure from the soil left in place at depths greater than 1.5 m (5 ft) that contained petroleum hydrocarbons above action levels.

2.1.5 Installation of Soil Gas Vapor Monitoring Well

On November 9 through 10, 1999, a truck-mounted hollow-stem auger drill rig was used to install a soil gas vapor monitoring well in the northwest portion of the former AST area, as shown in Figure 2. The augers had an outer diameter of 18.4 centimeters (cm) (7.25 in). Soil sampling was performed below a depth of 1.5 m (5 ft) using a 0.7-m (2-ft) long 5-cm (2-in) diameter stainless-steel soil sampler driven ahead of the auger bit with a drop hammer. Sample recoveries were poor due to the rocky soil. Where sufficient soil was recovered, samples were field tested for total petroleum hydrocarbons using a field test kit. Soil sampling was terminated at a depth of 6.1 m (20.1 ft) and the borehole was terminated at a depth of 6.7 m (22 ft). Groundwater was not expected and was not encountered. Soil descriptions, sampling intervals, field test kit results, and well construction details are summarized in Figure 3.

The soil gas vapor monitoring well was constructed using the hollow-stem augers as temporary conductor casing. The well casing consisted of 5-cm (2-in) diameter Schedule-40 Polyvinyl Chloride with threaded joints and a well screen of 0.5-millimeter (0.020-in) machine-cut slots in the 4.4 to 5.9-m (14.5 to 19.5-ft) depth interval.

Bechtel Nevada

Drill Log and Well Completion Diagram

PROJECT: CAU 342, CAS 23-56-01

LOCATION: NW edge of AST plume

BEGINNING DATE: November 9, 1999

ENDING DATE: November 10, 1999

GROUND SURFACE ELEVATION: Approx 3740 ft above mean sea level

BOREHOLE DIAMETER: 7.25 in (18.4 cm)

BOREHOLE TOTAL DEPTH: 22 ft (6.7 m)

GEOLOGIST/LOGGER: S. M. Parsons-DePry

DRILLING COMPANY: Bechtel Nevada

DRILL RIG MODEL: Mobile Drill B-59

DRILLING METHOD: Hollow-stem auger

SAMPLING METHOD: 2-ft (0.6-m) long by 2-in (5-cm) diameter stainless-steel soil sampler lined with brass sample tubes and advanced with drop hammer

BOREHOLE COMPLETION: Soil Gas Monitoring Well

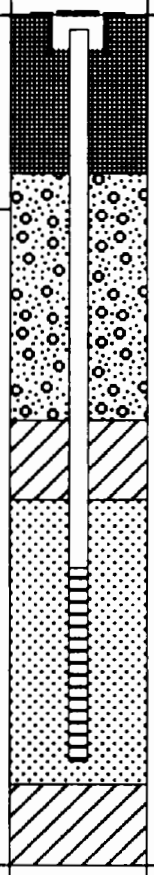
Depth ft (m)	Hanby Results ppm	Sample Recovery	Soil Description	Well Graphic	Well Construction Description
			Ground Surface		File: wellog_1.cdr
0			**0 to 5 ft CLEAN BACKFILL (Type II)**		0.25 TO 14.5 FT 2-IN SCH-40 PVC BLANK WELL CASING 0 to 1 ft Flush-mounted well box set in concrete pad. 1 to 4.1 ft Portland cement and gypsum.
5 (1.5)	250		**5 to 22 ft REDDISH BROWN GRAVELLY SAND** Strong odor (gasoline?).		4.1 to 10.5 ft Mixture of Grade 2 sand and native soil.
	200		8.3 to 8.8 ft Same as above.		
	150		8.8 to 9.3 ft Same as above.		
10 (3.0)					
	280		10.6 to 11.1 ft Same as above.		10.5 to 12.5 ft Hydrated 3/8-in bentonite chips.
	100		11.6 to 11.7 ft Strong odor (solvent?).		
	300		12.7 to 13.0 ft Same as above.		
	X		14.4 to 14.6 ft Rocky, poor recovery.		
15 (4.6)					12.5 to 19.85 ft Grade 2 sand (filter pack).
	200		15.5 to 15.9 ft Rocky		
	750		16.5 to 16.9 ft Strong odor (solvent?).		14.5 TO 19.5 FT 2-IN SCH-40 PVC WELL SCREEN CASING WITH 0.020-IN MACHINE-CUT SLOTS
	X		17.7 to 18.1 ft Rocky, poor recovery.		
	1000		18.7 to 19.1 ft Strong odor (solvent?).		
20 (6.1)	1000		19.7 to 20.1 ft Same as above.		19.85 to 22 ft Hydrated 3/8-in bentonite chips.
			DRILLING TERMINATEDAT 22 FT		

FIGURE 3
SOIL GAS VAPOR MONITORING WELL, CAU 342: AREA 23 MERCURY FIRE TRAINING PIT

The annular space of the soil gas vapor monitoring well was filled with following material:

- 0 to 0.3 m (0 to 1 ft) depth, surface completion (well box set at grade in concrete pad).
- 0.3 to 1.25 m (1 to 4.1 ft) depth, portland cement with gypsum.
- 1.25 to 3.2 m (4.1 to 10.5 ft) depth, fill (Grade 2 sand and collapsed native soil).
- 3.2 to 3.8 m (10.5 to 12.5 ft) depth, hydrated 1-cm (3/8-in) bentonite chips.
- 3.8 to 6.1 m (12.5 to 19.85 ft) depth, Grade 2 sand filter pack.
- 6.1 to 6.7 m (19.85 to 22 ft) depth, hydrated 1-cm (3/8-in) bentonite chips.

2.1.6 Decontamination of Equipment

After the final load of excavated soil was handled, the bucket and tires of the backhoe and loader were cleaned by brushing off visible residue and then washing the buckets with an Alconox® detergent solution and rinsing the tires with water. Rinsate was contained in excavated soil already containing petroleum hydrocarbons. Drilling augers were wrapped in plastic and transported to the Area 6 sub-dock where they were pressure washed and the rinsate directed to an oil-water separator.

2.1.7 Perimeter Fence and Warning Signs

The existing perimeter fence consisted of T-posts and two strands of yellow rope. The weathered yellow rope was replaced with yellow-plastic coated steel wire with warning signs reading: "Warning: Underground Petroleum Hydrocarbon Contamination. Contact Environmental Restoration (295-7946) before working in this area. FFACO CAU 342." The perimeter fence encloses a rectangular area approximately 85 by 115 m (280 by 380 ft).

2.1.8 Administrative Land Use Restrictions

On December 14, 1999, the locations of the four perimeter-fence corners (as well as the soil gas vapor monitoring well) were surveyed for use restriction purposes. The Land Use Restriction form with survey data was submitted on February 1, 2000, and a copy is included in Appendix B.

2.2 DEVIATIONS FROM THE CAP AS APPROVED

No significant deviations occurred from the approved scope of work as outlined in the CAP (DOE, 1999b).

2.3 CORRECTIVE ACTION SCHEDULE AS COMPLETED

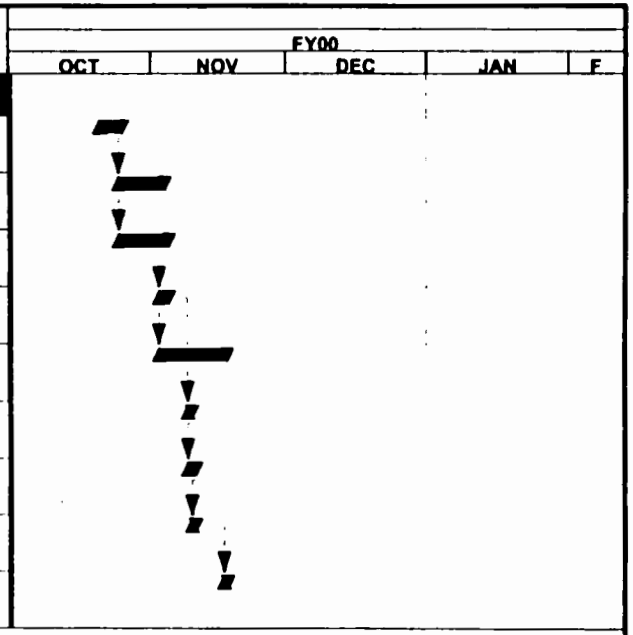
The corrective action field activities began on October 25, 1999, and were completed on November 17, 1999. A few minor fence repairs were done on January 10, 2000. A corrective action schedule as completed is provided in Table 1.

2.4 SITE PLAN / SURVEY PLAT

The final as-built site plan was not surveyed because there are no engineered structures remaining at the site. A site plan showing the approximate locations of the perimeter fence, soil gas vapor monitoring well, and former excavations is shown in Figure 2. Surveyed coordinates for the perimeter fence corners and soil gas vapor monitoring well are shown in Figure 1.

TABLE 1 - CAU 342 CORRECTIVE ACTION SCHEDULE AS COMPLETED

Activity ID	Activity Description	Cal ID	Actual Start	Actual Finish
CAU 342 CORRECTIVE ACTION PLAN - AS COMPLETED				
C34201	Mobilize Excavation Equipment	2	21OCT99	25OCT99
C34211	Excavate Impacted Soil/Haul To A6LF	2	25OCT99	03NOV99
C34221	Haul Borrow Soil/Backfill Excavations	2	25OCT99	04NOV99
C34231	Demobilize Excavation Equipment	2	03NOV99	04NOV99
C34241	Repair Perimeter Fence/Install Warning Signs	2	03NOV99	17NOV99
C34251	Mobilize Drilling Equipment	2	09NOV99	09NOV99
C34261	Drill/Install Soil Gas Monitoring Well	2	09NOV99	10NOV99
C34271	Demobilize Drilling Equipment	2	10NOV99	10NOV99
C34281	Haul Drilling Wastes to A6LF	2	17NOV99	17NOV99



Sheet 1 of 1

3.0 WASTE DISPOSITION

The 85 truck loads of excavated soil and debris generated as part of the corrective action field activities were disposed in the Area 6 Hydrocarbon Landfill between October 25, 1999 and November 17, 1999. Nearly all the waste was soil - approximately one yd^3 consisted of plastic sheeting, sand bags, and other debris found at the site. Each load was weighed either on the permanent truck scale at Gate 100 or on a portable truck scale that was temporarily located at the Area 6 Hydrocarbon Landfill. Each load was accompanied by a load verification form and was logged into the landfill daily access register. The average load was approximately 14 m^3 (18 yd^3), and 23 metric tons (25 short tons), for a total of 1,150 m^3 (1,500 yd^3) and 1,900 metric tons (2,100 short tons) of waste disposed. Waste disposition summary documentation is included in Appendix A.

THIS PAGE INTENTIONALLY LEFT BLANK

4.0 CLOSURE VERIFICATION RESULTS

4.1 VERIFICATION ACTIVITIES

Verification soil samples at CAU 342 were not required (DOE, 1999b) for the following reasons:

- Potential release sources had been previously removed (DOE, 1998)
- Areas exceeding, and not exceeding, the NDEP Action Level had already been determined in the site characterization (DOE, 1999a).
- Soil below a depth of 1.5 m (5 ft) exceeding the NDEP Action Level was closed in place.

As a final check, however, completed excavations were visually inspected for staining by the Technical Lead, minor amounts of additional discolored soil in several areas was removed, (estimated to be less than 4 m^3 [5 yd^3]).

The excavations were backfilled after verbal approval was given to terminate excavation activities. Clean backfill was placed in 0.2-m (8-in) lifts and compacted either by downward blows of the backhoe bucket or by several passes of the backhoe or loader. The compacted backfill was mounded slightly above grade to minimize ponding. Confirmation compaction testing was not required (DOE, 1999b).

4.2 USE RESTRICTION

All soil at depths less than 1.5 m (5 ft) and containing petroleum hydrocarbons at or above the NDEP Action Level was removed and replaced with clean backfill. All soil at depths greater than 1.5 m (5 ft) and containing petroleum hydrocarbons at or above the NDEP Action Level was left in place. The clean backfill creates a substantial barrier to exposure if land use is regulated. In addition to the perimeter fence and warning signs, administrative controls were implemented by submitting a use restriction form (Appendix B).

Future use of any land related to CAU 342 is restricted from any activity that may alter or modify the containment controls as approved by the state, unless appropriate concurrence is obtained in advance.

THIS PAGE INTENTIONALLY LEFT BLANK

5.0 CONCLUSION

5.1 POST-CLOSURE PLAN

The CAU 342 Post-Closure Plan consists of biannual (once every six months) site inspections and biennial (once every two years) soil gas vapor monitoring. The site inspections will document the condition of the site and determine if repairs, additional backfilling, or more effective use restrictions are needed. The soil gas vapor monitoring will determine if the remaining petroleum hydrocarbons beneath the AST area are undergoing natural biodegradation. Initial inspection and baseline soil gas monitoring will be done within six months after completion of field activities.

Additional, nonscheduled inspections may be required after severe weather events such as flash flooding or high winds. The post-closure inspection form is included in Appendix C. Identified maintenance and repair requirements will be remedied within 90 days of discovery and documented in writing at the time of repair.

Soil gas samples will be submitted to a qualified laboratory for analysis of volatile organic compounds (VOCs) (EPA Method TO-14A) and semi-volatile organic compounds (SVOCs) (EPA Method TO-13A modified). In addition, the soil gas vapor will be field screened for oxygen, carbon dioxide, methane, and VOCs using a micro gas chromatograph or similar instrument.

A report will be prepared following each biennial soil gas vapor monitoring event. The biennial report will include completed site inspection forms, repair records (if any), soil gas analytical results and discussion, and recommendations. A copy of each biennial report will be submitted to the NDEP. Sampling will continue for six years (an initial sampling event followed by three biennial sampling events.) If after six years the analytical results show that natural attenuation is decreasing petroleum hydrocarbon levels in the soil, monitoring will be discontinued. If levels are not shown to be decreasing after six years, a determination will be made by DOE/NV and NDEP as to how to proceed.

5.2 CLOSURE RECOMMENDATION

The information presented in this report documents that the closure of CAU 342: Mercury Fire Training Pit was accomplished following the NDEP-approved CAP (DOE, 1999b).

The DOE/NV requests that a Notice of Completion be issued by the NDEP to DOE/NV for the closure of CAU 342 (CAS 23-56-01) and that CAU 342 be moved from Appendix III to Appendix IV of the FFACO "Closed Corrective Action Units."

THIS PAGE INTENTIONALLY LEFT BLANK

6.0 REFERENCES

BN, see Bechtel Nevada.

Bechtel Nevada, 1999a. Field Management Plan for Corrective Action Unit 342: Area 23 Mercury Fire Training Pit, Nevada Test Site, Nevada, Las Vegas, NV.

Bechtel Nevada, 1999b. Site Specific Health and Safety Plan for Corrective Action Unit 342: Area 23 Mercury Fire Training Pit, Nevada Test Site, Nevada, Las Vegas, NV.

DOE, see U.S. Department of Energy.

EPA, U.S. Environmental Protection Agency.

FFACO, see Federal Facility Agreement and Consent Order.

Federal Facility Agreement and Consent Order of 1996. Prepared by Nevada Division of Environmental Protection, U.S. Department of Energy, and U.S. Department of Defense.

Nevada Administrative Code, 1996. NAC 445A.2272, "Contamination of Soil: Establishment of Action Levels." As adopted by the Nevada Environmental Commission, Carson City, NV.

U.S. Department of Energy, Nevada Operations Office, 1998. Corrective Action Investigation Plan for CAU 342: Area 23 Mercury Fire Training Pit, Nevada Test Site, Nevada, DOE/NV--498, UC-700, Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office, 1999a. Corrective Action Decision Document for Corrective Action Unit 342: Area 342 Mercury Fire Training Pit, Nevada Test Site, Nevada, Rev. 1, DOE/NV--534, Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office, 1999b. Corrective Action Plan for Corrective Action Unit 342: Area 342 Mercury Fire Training Pit, Nevada Test Site, Nevada, DOE/NV--559, Las Vegas, NV.

U.S. Environmental Protection Agency, 1996. Region IX Preliminary Remediation Goals (PRGs), San Francisco, CA.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

WASTE DISPOSITION DOCUMENTATION

Bechtel Nevada

Interoffice Memorandum

To: W. F. Johnson

Date: February 14, 2000

From: C. A. Stowell, Project Manager
Solid Waste Operations

No.: 2150-CS-00-0025

Subject: **Waste Disposal Documentation for Corrective Action Unit (CAU) 340 and 342**
Project No. N/A

Between November 8, 1999 and January 13, 2000, Nevada Test Site (NTS) landfills received approximately 3,029 tons of waste from **CAU 340** remediation activities.

- Approximately 71 tons of hydrocarbon impacted waste were disposed at the NTS Area 6 Hydrocarbon Class III Industrial Solid Waste Disposal Site (SWDS).
- Approximately 2,937 tons of waste were disposed at the NTS Area 23 Class II Municipal and Industrial SWDS.
- Approximately 21 tons of waste were disposed at the NTS Area 9 U10c Class III Industrial SWDS.

Additionally, on December 16, 1999, approximately 16 tons of hazardous waste from CAU 340 remediation activities was transported from the NTS to Aragonite, UT for disposal. Enclosed is a copy of the Uniform Hazardous Waste Manifest associated with this waste.

Between October 25, 1999 and November 3, 1999, the Area 6 Hydrocarbon Class III Industrial Solid Waste Disposal Site received approximately 2,118 tons of hydrocarbon impacted waste from **CAU 342** remediation activities.

/s/ Signature on file

C. A. Stowell

FEC/CAS:cjs
Subject Code: WMT3

Enclosures: as stated

cc w/o encs.
Correspondence Control, NLV008
J. M. Holden, NTS207
C. J. Schwartze, NTS207

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX B

USE RESTRICTION INFORMATION

CAU Use Restriction Information

CAU Number/Description: **CAU 342: Area 23 Mercury Fire Training Pit**

Applicable CAS Numbers/Descriptions: **CAS 23-56-01: Former Mercury Fire Training Pit**

Contact (organization/project): **DOE/NV Industrial Sites Project Manager**

Surveyed Area (UTM coordinates; Zone 11, NAD 27): **Four corners of perimeter fence**

North: 4,057,909.48mN; 589,219.66mE. **East: 4,057,839.66mN; 589,320.07mE.**

South: 4,057,702.05mN; 589,228.35mE. **West: 4,057,771.56mN; 589,123.15mE.**

Survey Date: **December 14, 1999** Survey Method (GPS, etc.): **GPS**

Site Monitoring Requirements: **Visual inspection as specified by the closure documentation**

Required Frequency (quarterly, annually?): **Biannually (once every six months)**

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

Use Restrictions

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

Comments: **See the Closure Report for additional information on the condition of the site and any monitoring and/or inspection requirements.**

Submitted By: /s/ Signature on file **Date:** 2/15/00

cc with copy of survey map:
CAU Files (2 copies)

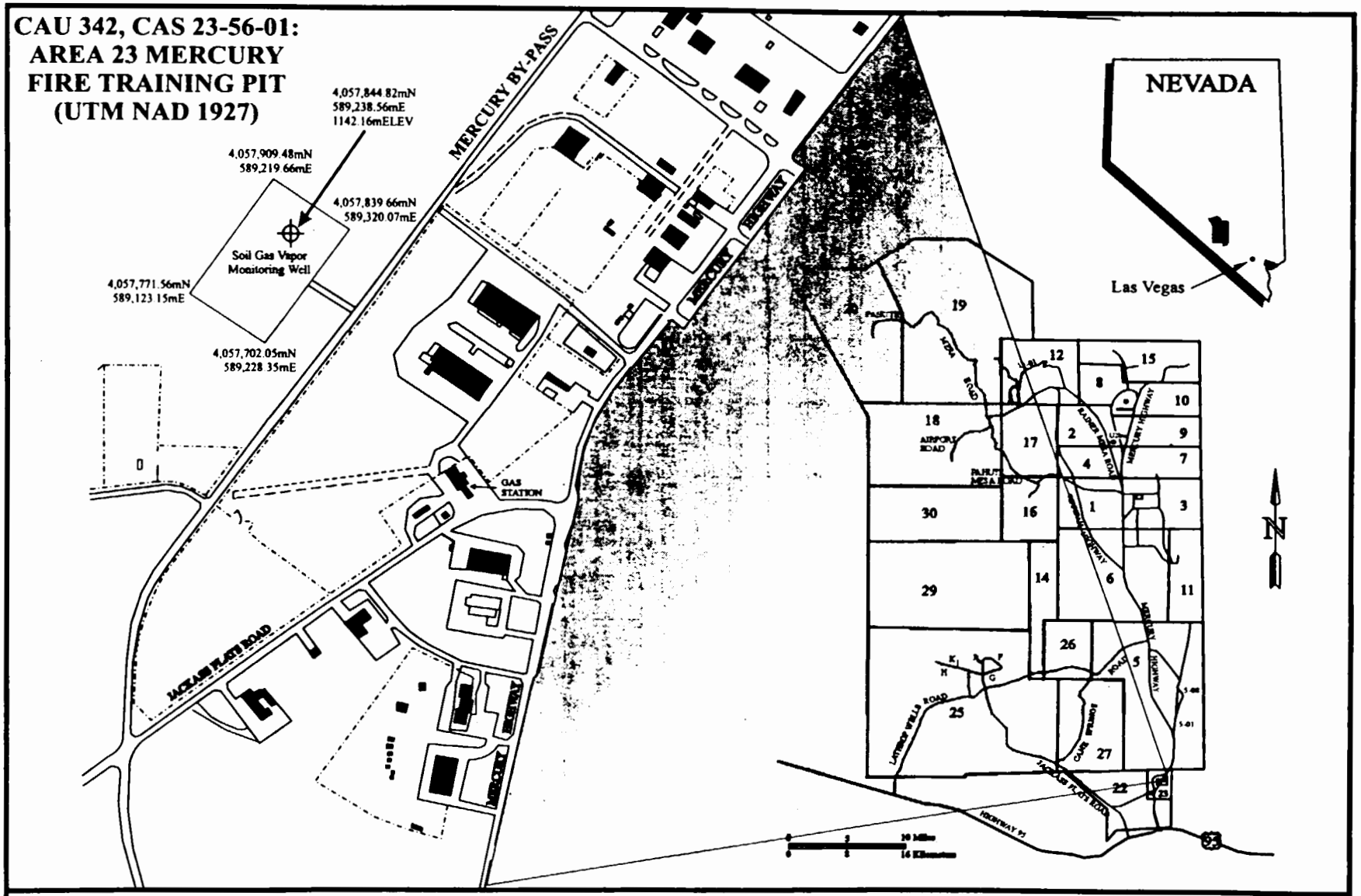


FIGURE 1
CAU 342, CAS 23-56-01: AREA 23 MERCURY FIRE TRAINING PIT, NEVADA TEST SITE

APPENDIX C

POST-CLOSURE INSPECTION FORM

CAU 342: AREA 23 MERCURY FIRE TRAINING PIT
POST-CLOSURE INSPECTION FORM

Inspect the well and surrounding area. Look for any unusual change in the unit such as accumulation of water, chemical odors, deterioration of structures, etc. Refer to the previous inspection of the unit in order to identify any changes. Inspections should be completed after a problem is reported by a contractor, DOE, NDEP, ER or other BN employees. Post Closure Care inspections will be done twice a year.

GENERAL INFORMATION

1. Date of inspection: _____

2. Facility Manager (name and organization):_____

3. Reason for inspection: Biannual: ____ Problem Reported: _____ Unusual weather: ____
   Details (Name, organization and telephone number of person reporting problem): _____
   _____

4. Describe weather conditions over the past few weeks (high winds, precipitation, local flooding):
   _____
   _____
   _____

MONITORING WELL AND GENERAL SITE CONDITION

5. Condition of monitoring well and cover (cracked, tilted): _____
   _____
   _____
   _____
   _____

6. Condition of fencing (breaks, tilted, damaged): _____
   _____

7. Condition of signs (missing signs, fading, damaged): _____
   _____

8. Signs of erosion indicating runoff or runon (into) the area that could impact the monitoring well?
   No _____ Yes _____ If yes, explain: _____
   _____
   _____
   _____
   _____

CAU 342: AREA 23 MERCURY FIRE TRAINING PIT
POST-CLOSURE INSPECTION FORM (Continued)

AREA SURROUNDING WELL

9. Describe any significant changes in the general area (within several hundred feet of the unit) from the previous inspection. Changes can include water in the area, change in land use, storage of materials nearby, soil piles, change in use of the facility, etc. _____

10. What is the (possible) effect of the change? _____

11. Other comments or observations: _____

12. Recommendations: _____

13. Does the finding(s) of this inspection require another inspection prior to the scheduled monthly inspection? No _____ Yes _____ If yes, date of next inspection: _____

Significant changes noted must be notified to the Project Manager and Task Manager upon return to the office.

Inspected by : _____ Signed: _____ Date: _____

Names of other persons on inspection (print):

_____ _____ _____

DISTRIBUTION LIST

DISTRIBUTION LIST

* Provide copy of initial distribution or Revision 0; remainder of list gets Revision 0 if approved without changes. The entire list receives Revision 1, if issued.

Nevada Department of Environmental Protection

Paul J. Liebendorfer — 2 (Controlled) *
Bureau of Federal Facilities
Division of Environmental Protection
333 W. Nye Lane, Room 13B
Carson City, NV 89706-0866

Michael McKinnon, Las Vegas Office — 1 (Controlled) *
Bureau of Federal Facilities
Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101-1049

U.S. Department of Energy

Janet Appenzeller-Wing — 1 (Uncontrolled) *
Environmental Restoration Division
U.S. Department of Energy, Nevada Operations Office
P.O. Box 98518 M/S 505
Las Vegas, NV 89193-8518

Clayton Barrow — 1 (Uncontrolled) *
Environmental Restoration Division
U.S. Department of Energy, Nevada Operations Office
P.O. Box 98518 M/S 505
Las Vegas, NV 89193-8518

Sabrina Lawrence — 1 (Controlled) *
Environmental Restoration Division
U.S. Department of Energy, Nevada Operations Office
P.O. Box 98518, M/S 505
Las Vegas, NV 89193-8518

U.S. Department of Energy — 1 (Uncontrolled, electronic copy)
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831-0062

DISTRIBUTION LIST (continued)

U.S. Department of Energy (continued)

U.S. Department of Energy
Nevada Operations Office
Technical Information Resource Center
P.O. Box 98518, M/S 505
Las Vegas, NV 89193-8518
1 (Uncontrolled)

Manager, Southern Nevada
FFACO Public Reading Room
P.O. Box 98521, M/S NLV040
Las Vegas, NV 89193-8521
1 (Controlled) &
1 (Uncontrolled)

Manager, Northern Nevada
FFACO Public Reading Room
Nevada State Library and Archives Federal Publications
100 North Stewart Street
Carson City, NV 89701-4285
1 (Uncontrolled)

Bechtel Nevada

Correspondence Control
Bechtel Nevada
P.O. Box 98521, M/S NLV008
Las Vegas, NV 89193-8521
1 (Uncontrolled) *

Environmental Management Library
Bechtel Nevada
P.O. Box 98521, M/S NLV080
Las Vegas, NV 89193-8521
1 (Uncontrolled) *

David Cowser
Bechtel Nevada
P.O. Box 98521, M/S NLV082
Las Vegas, NV 89193-8521
1 (Uncontrolled) *

Ann Heidema
Bechtel Nevada
P.O. Box 98521, M/S NLV022
Las Vegas, NV 89193-8521
1 (Uncontrolled) *

DISTRIBUTION LIST (continued)

Bechtel Nevada (continued)

Wayne Johnson — 1 (Uncontrolled) *
Bechtel Nevada
P.O. Box 98521, M/S NTS306
Las Vegas, NV 89193-8521

Steve Nacht — 1 (Uncontrolled) *
Bechtel Nevada
P.O. Box 98521, M/S NTS306
Las Vegas, NV 89193-8521

Jerry Bonn — 1 (Uncontrolled) *
Bechtel Nevada
P.O. Box 98521, M/S NTS306
Las Vegas, NV 89193-8521

Shannon Parsons-DePry — 1 (Uncontrolled) *
Bechtel Nevada
P.O. Box 98521, M/S NTS306
Las Vegas, NV 89193-8521

Curtis Obi — 1 (Uncontrolled) *
Bechtel Nevada
P.O. Box 98521, M/S NTS306
Las Vegas, NV 89193-8521

IT Corporation

Brad Jackson — 2 (Uncontrolled) *
IT Corporation
P.O. Box 93838, M/S NLV439
Las Vegas, NV 89193-3838

IT FFACO Support Office — 1 (Controlled)
IT Corporation
P.O. Box 93838, M/S NLV439
Las Vegas, NV 89193-3838

THIS PAGE INTENTIONALLY LEFT BLANK

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
DOCUMENT REVIEW SHEET

DOCUMENT REVIEW SHEET

Document Title/Number: Draft Closure Report for Corrective Action Unit 342: Area 23 Mercury Fire Training Pit
Document Date: March 2000
Revision Number: DRAFT
Originator/Organization: BN/ER
Date Comments Due: March 31, 2000
Reviewer/Organization: NDEP (letter dated April 11, 2000, from Michael D. McKinnon to Runore C. Wycoff)

Comment Number/ Location	Type[a]	Comment	Comment Response	Accept
1	M	Page 4, sixth bullet: wording implies 18,000 mg/kg diesel was detected at a depth of 50 ft bgs although analytical data indicates this concentration was detected at a depth of 25 ft bgs. Depth of maximum contaminant concentration needs clarification.	This bullet has been reworded to state the greatest concentration (18,000 mg/kg diesel) was found at a depth of 25 ft.	Yes

a. Comment Types: M=Mandatory S=Suggested

THIS PAGE INTENTIONALLY LEFT BLANK