Burns Asbestos Removal Action
Removal Action Report
Former Burns Air Force Radar Range
Harney County, Oregon
TDD: 04-06-0001

Contract: 68-S0-01-01
December 2004

Region 10

START-2

Superfund Technical Assessment and Response Team

Submitted to: Michael Szerlog, On-Scene Coordinator
United States Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98101

BURNS ASBESTOS REMOVAL ACTION
REMOVAL ACTION REPORT
TDD: 04-06-0001

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES (CONTINUED)

LIST OF ACRONYMS

Acronym	Definition
%	percent
ACM	asbestos-containing material
AHERA	Asbestos Hazard Emergency Response Act
ARAR	applicable or relevant and appropriate requirements
Alpine	Alpine Abatement Associates, Inc.
AST	aboveground storage tank
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
BLM	Bureau of Land Management
BPA	Bonneville Power Administration
BUHS	Burns Union High School
°C	degrees Celsius
CAB	cement-asbestos board
Cascade	Cascade Insulation, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CMU	cement masonry unit
cm^2	square centimeters
DERP-FUDS	Defense Environmental Restoration Program for Formerly Used Defense Sites
DQOs	data quality objectives
E & E	Ecology and Environment, Inc.
EPA	United States Environmental Protection Agency
EMSL	EMSL Analytical, Inc.
EQM	Environmental Quality Management, Inc.
ERRS	Emergency and Rapid Response Services
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FFS	Focused Feasibility Study

LIST OF ACRONYMS (CONTINUED)

f/cc	fibers per cubic centimeter
GC	gas chromatograph
GRI	Geotechnical Resources, Inc.
GSA	General Services Administration
H&SP	Health and Safety Plan
HEPA	high efficiency particulate air
ISO	International Standards Organization
L/min	liters per minute
Lockheed Martin	Lockheed Martin Technology Services
LOD	limit of detection
mg/kg	milligrams per kilogram
$\mu g/100\ cm^2$	micrograms per 100 square-centimeters
µm	micrometer
MBTA	Migratory Bird Treaty Act
MCE	mixed cellulose ester
MS	matrix spike
MSD	matrix spike duplicate
NIOSH	National Institute for Occupational Safety and Health
NPL	National Priorities List
NRHP	National Register of Historic Places
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODHS	Oregon Department of Human Services
OSC	On-Scene Coordinator
PA	Preliminary Assessment
PCBs	polychlorinated biphenyls
PCM	phase contrast microscopy
PDL	Public Domain Lands
PEL	permissible exposure limit
PLM	polarized light microscopy
PPE	personal protective equipment

LIST OF ACRONYMS (CONTINUED)

ppm	part per million
PST	(USCG) Pacific Strike Team
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Removal Action
RD	Remedial Design
RPD	relative percent difference
s/cc	structures per cubic centimeter
s/mm2	structures per square millimeters
SHPO	(Oregon) State Historic Preservation Office
SOW	Statement of Work
SSSP	Site Specific Sampling Plan
START	Superfund Technical Assessment and Response Team
STEL	short term exposure limit
TCLP	Toxicity Characteristic Leaching Procedure
T&D	transportation and disposal
TDD	Technical Direction Document
TEM	transmission electron microscopy
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, or disposal facility
TSI	thermal system insulation
TWA	time-weighted average
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VAT	vinyl asbestos tile
WRCC	Western Regional Climate Center
yd^3	cubic yard

1. INTRODUCTION

The Burns Asbestos Removal Action was performed at a former United States Air Force (USAF) station (the Burns Air Force Radar Range[1]) located in Harney County, Oregon. The site is located on top of Burns Butte to the southwest of the cities of Burns and Hines, Oregon. The site was a complex of approximately 38 buildings, including radar antennas, power generators, offices, barracks, and support buildings, that was operated as an Aerospace Defense Command site from the mid-1950s to 1970. After 1970, the site was portioned and transferred to various local and federal agencies, including the Bureau of Land Management (BLM), the Federal Aviation Administration (FAA), the Bonneville Power Administration (BPA), and a local school district. Currently, most of the site is under private ownership (ODHS 2003).

By 2004, approximately 25 of the buildings remained on site in very poor condition and were physical hazards. The buildings had been heavily vandalized and damaged; nearly every window from the site buildings was broken or missing, and most buildings had missing sections of walls and floors with exposed beams. Many walls, ceilings, and roofs were damaged and sagging.

The buildings were also a hazard to public health and the environment because of the presence of asbestos-containing materials (ACMs) and other Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances. Most of the buildings contained ACM[2], including thermal system insulation (TSI), floor tile, and cement-asbestos board (CAB) siding, that was damaged and friable. Other hazardous substances present on site included polychlorinated biphenyls (PCBs), metals, and oil.

Although the site is located in a remote area, it is visited regularly. Portions of the site are used for communication facilities by the FAA, BPA, and CenturyTel (a regional telephone company), and workers regularly visit these facilities to perform maintenance. Additionally, the site has been an

---

[1] In historic documents, the site is referred to as both the "Burns Air Force Range" and the "Burns Air Force Radar Station" (ODHS 2003). The site will be referred to as the "Former Burns Air Force Radar Range" in this report.

[2] ACM is defined by EPA as a material that contains 1 percent (%) or greater of asbestos, as determined by polarized light microscopy (PLM; 40 CFR Part 763).

attraction because the area was located on a butte away from the community and the former Air Force Radar Range was abandoned and provided unrestricted access. Reportedly, local teenagers have frequently visited the site, and nearly every building has been vandalized and covered with graffiti. Visitors to the site, including communication workers, hikers, and trespassers, were potentially exposed to airborne asbestos fibers as well as other chemical and physical hazards. The Oregon Department of Environmental Quality (ODEQ), Oregon Department of Human Services (ODHS), and the Agency for Toxic Substances and Disease Registry (ATSDR) determined that the site was a high priority for a cleanup action, and in April 2004, ODEQ requested the assistance of the United States Environmental Protection Agency (EPA; Monroe 2004).

On May 28, 2004, EPA issued an Action Memorandum for a time critical Removal Action (RA) at the site (EPA 2004). The RA began in June 2004 under the direction of Federal On-Scene Coordinator (OSC) Michael Szerlog. The cleanup contractor for the RA was Environmental Quality Management, Inc. (EQM), the Emergency and Rapid Response Services (ERRS) contractor for EPA Region 10. EPA tasked Ecology and Environment, Inc. (E & E) under Superfund Technical Assessment and Response Team (START)-2 Contract Number 68-S0-01-01, Technical Direction Document Number (TDD) 04-06-0001, to provide technical support for the RA.

The primary phase of field work for the RA was performed from June 10 through July 3, 2004. An additional phase of field work to complete the RA was conducted from October 11 through 15. At the conclusion of the RA, the site buildings had been demolished, and site waste materials, including asbestos-containing waste and demolition debris, were transported off site for proper disposal at an approved treatment, storage, or disposal facility (TSDF). PCB-contaminated debris and soil was also transported off site for disposal at an approved TSDF.

This report is organized into the following sections: Introduction (Section 1); Site Conditions and Background (Section 2); Removal Activities (Section 3); Sample Collection and Analysis (Section 4); Quality Assurance / Quality Control (Section 5); Problems Encountered (Section 6); Community Relations (Section 7); Health and Safety (Section 8); Cost Summary (Section 9); Effectiveness of Removal Action (Section 10); and References (Section 11). Photographs taken throughout the RA are presented in Appendix A.

2. SITE CONDITIONS AND BACKGROUND

2.1 SITE DESCRIPTION

2.1.1 Location

The former Burns Air Force Radar Range is located in Harney County, Oregon, near Burns and Hines (Figure 2-1). The site is located on top of Burns Butte, which is approximately 3 miles to the west of the city of Hines and 4 miles to the west-southwest of the city of Burns (Maptech 2001). The top of Burns Butte is located at an approximate elevation of 5,220 feet above sea level, which is approximately 1,100 feet above the cities of Burns and Hines (Maptech 2001). The site is located at 43° 33' 44" north latitude and 119° 9' 3.5" west longitude (URS 1996).

2.1.2 Site Layout

The former Burns Air Force Radar Range was built on 20.96 acres[3] (Lau 1971) of land as a complex of approximately 44 buildings and structures[4], including radar antennas, power generators, offices, barracks, support buildings, and water tanks (see Figure 2-2) The on-site buildings included various types of construction, including wood frame with siding, pre-fabricated metal buildings (Butler-type), Quonset huts, and concrete-block buildings (Roberts 1971). The site included three large, hexagonal "radomes", which were used to house large radar antennas. At the time of the RA, one radome remained (Building 200), while only the foundations remained for the other two (Buildings 211 and 220).

---

[3] The 20.96 acres includes the original operational area of the former Burns Air Force Radar Range. The USAF acquired an additional 19.08 acres of property for access roads and a family housing annex in the city of Burns. The RA was primarily performed on the 17.31 acres of privately owned land that remain from the original Air Force Range. See Sections 2.2 and 2.3 for more details.

[4] There have been at least 44 named or numbered structures (buildings, covered walkways, tanks, and a water well) on site. This number includes some buildings that were identified in historic documents but were no longer present at the time of the RA. This number also includes some existing buildings (CenturyTel, FAA, and BPA) that were in use at the time of the RA and that were not part of the privately owned part of the site.

At the time of the RA, some of the buildings had been moved or demolished, with approximately 25 buildings remaining on site in very poor and damaged condition[5]. Nearly all of the buildings had been vandalized, including damage from gun shots. Nearly all windows in the buildings were broken or missing, and most buildings had missing sections of walls and floors, with exposed beams and sagging roofs.

2.1.3 Terrain

Burns Butte is located in the arid high desert of southwest Oregon, with rugged topography. Burns Butte is long and narrow with a north-south orientation and is one of the highest points in the surrounding area. The site is located on top of the butte and is relatively flat, with steep slopes dropping down the sides of the butte to the east and west. Burns Butte is located in a series of rugged hills, while the cities of Hines and Burns, to the northwest, are located on a continuous plain.

2.1.4 Geology

Information about the site geology was obtained from ODEQ's Focused Feasibility Study:

> The study area is located on a sequence of dozens of volcanic flows and clastic units averaging 250 to 300 feet thick. These units consist of a series of rhyolithic lava flows which form the top of Burns Butte and surrounding peaks (Burns Butte Rhyolite) and are underlain by silica-rich ash fall deposits and tuff flows (Wheeler Springs Tuff). The eruptive center for these flows was under Burns Butte or immediately to the west. The volcanic units were erupted during Miocene time and the rhyolite has been dated at 7.54 ±0.01 million years before present. Competence of the units varies from completely unconsolidated to highly welded and glassy. Structure of the region is dominated by numerous closely spaced faults trending northwest-southeast. Some localized folding is present with fold axes paralleling the fault trends. The elongated top of Burns Butte is bracketed on either side by these faults. (ODEQ 2003a)

2.1.5 Hydrogeology

Groundwater at the site is very deep; documents indicate that the on-site water well (Number 830 on site figures) was installed to a depth of 1,148 feet below ground surface (bgs; Western Drilling Co.

[5] Three active site buildings, which were not part of the RA, were intact and in good condition at the time of the RA, including the "telephone building" (CenturyTel), the FAA facility near Building 220, and Building 230 (BPA).

1966) and that groundwater was encountered at 400 feet bgs (URS 1996). A survey of other wells within two miles of the site indicated similar groundwater depths (ODEQ 2003a).

No surface water was observed on site during the RA. The only surface water bodies within four miles of the site are springs, livestock watering holes, and small, intermittent, spring-fed creeks (URS 1996).

2.1.6 Climate

Average temperatures in Burns range from 41.6 to 74.9 degrees Fahrenheit (°F) in June and 27.3 to 61.8 °F in October, and the average annual precipitation is 10.56 inches (WRCC 2004). During the RA, weather conditions ranged from cool and rainy (with freezing temperatures on some mornings) to clear, warm, and sunny. During the last week of June, there were thunderstorms in the afternoons.

2.2 SITE HISTORY AND OPERATIONS

The USAF operated the Burns Air Force Radar Range from the mid-1950s to until 1970. The facility was used as an Aerospace Defense Command site, with the primary function of maintaining and monitoring radar equipment for aerospace defense. Additional site operations included housing, feeding, and general services for Air Force personnel and equipment. (URS 1996)

After 1970, the site was transferred by General Services Administration (GSA) to various local and federal agencies. Some sections of the property were returned to the BLM, while the main part of the site was transferred to the Burns Union High School (BUHS) District No. 2. BUHS used the facility for educational purposes until 1977, when the property transferred back to GSA. (Harrell 1991)

During the 1970s, three portions of the site were subdivided and transferred to various companies and agencies for use as communication facilities that currently remain active at the site. These facilities include the “telephone building”, which is operated by CenturyTel (0.64 acres, originally acquired by United Telephone Company); an FAA directional finder near building 220 (1.66 acres); and Building 230 and surrounding land, which BPA uses for a communication tower (1.83 acres). (Harrell 1991)

The remaining part of the site includes some 25 damaged buildings on 17.31 acres and has been privately owned since 1979. In general, there have been no formal operations at the site while under private ownership other than recreation (hiking and motorcycling), trespassing, and vandalism (ODHS 2003). Currently, the private owner of the site leases some of the space for the use of private radio antennas (USACE 1995), of which one was observed during the RA at Building 133.

Current zoning in the area allows farming and ranching but restricts residential development. However, the current property owner recently arranged to have the site re-zoned to Rural Residential status, which would allow the site to be subdivided into three residential lots. (ODHS 2003) The land surrounding the site is managed by BLM.

2.3 SITE OWNERSHIP

Prior to the site's development, the site was federally-owned open range (URS 1996). Between 1954 to 1958, the USAF acquired a total of 40.04 acres of land in and near Burns to use for the Burns Air Force Radar Range. The land was obtained from a variety of sources, including Public Domain Lands (PDL), BLM, and a lease with a private landowner. Of the 40.04 acres, 20.96 acres was obtained for the operational area of the station (the "station proper") on Burns Butte; 8.41 acres was obtained in the city of Burns for a family housing annex; 4.94 was leased from the Urizar Cattle Company for an access road from a Forest Service road to the station; and 5.73 acres was granted a perpetual easement for the main access road over public domain lands. (Roberts 1971)

After the Burns Air Force Radar Range was determined excess in 1970, it was reported to GSA for disposal. Of the original 40.04 acres, 5.25 acres (of the 5.73 acre parcel) was returned to BLM for road access[6]. The remaining 34.79 acres (21.44 acres of the station proper, 8.41 acres in Burns for the family housing annex, and 4.94 acres of the leased access road) were assigned to the federal Department of Health, Education, and Welfare, who conveyed the property to the BUHS on December 10, 1973. (Harrell 1991)

In January 1976, BUHS conveyed 0.64 acres of the station proper to United Telephone Company, which reduced the remaining area to 20.80 acres. In August 1977, BUHS returned the 20.80 acres of the station proper and the 4.94 of leased lands back to GSA. In March 1981, BUHS reconveyed the remaining 8.41 acres of the original site (from the family housing annex in Burns) to GSA. The 4.94 acres of leased land were returned to their original owner by allowing the leases to end. (Harrell 1991)

Of the remaining 20.80 areas of the station proper, GSA transferred 1.66 acres to FAA and 1.83 acres to BPA in 1978 (Harrell 1991). The remaining 17.31 acres of the station proper were transferred to James and Alice Towery in 1979 (Harrell 1991). In 1980, Russell and Aileen Wilson acquired the property (ODEQ 2003a). At the time of EPA's Preliminary Assessment (PA) in 1996, Russell Wilson was still listed as the property owner, while Marion Towery was listed as the site contact (URS 1996). In

---

[6] The remaining 0.48 acres remained with the station proper.

June 2003, the Wilsons conveyed the property to Kathleen Towery (ODEQ 2003a). Currently, the property remains in the possession of Kathleen and Richard Towery, with Wade Towery listed as the site contact (Monroe 2004).

2.4 PREVIOUS INVESTIGATIONS

There have been several previous investigations at the site performed by various state and federal agencies. Additionally, the United States Army Corps of Engineers (USACE) performed some cleanup work at the site. Summaries of these previous investigations and remediation work are provided below.

GSA Surveys and Inspections, 1971 and 1980

After the USAF ceased operations at the Burns Air Force Radar Range, GSA completed several surveys related to the transfer of the property to other agencies and owners. In 1971, GSA prepared a detailed description of the property and its buildings, including dimensions and construction types (Roberts 1971, Lau 1971). In 1980, GSA performed an inspection for PCBs at the site, in preparation of a possible sale of electrical equipment to the C. P. National Corporation[7]. The report indicates that several transformers, which were suspected of containing PCBs[8], were damaged (some with bullet holes) and laying on the ground. Some of these transformers were leaking oil, and there was evidence that the contents of some had been dumped on the ground so that the copper wiring inside could be recovered. (Lockwood 1980)

Various Site Investigations and Cleanup Actions, USACE, 1987 through 1997

From 1987 through 1997, the USACE investigated the site and performed limited cleanups under the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS; USACE 1991a, Stockton 1994, Jones 1998). An initial investigation was performed in August 1987, and additional site investigations were performed in November 1987, 1991, 1992, 1993, 1994, and 1995 (USACE 1995, GRI 1995, Monson 1995). The initial site evaluation identified various hazards at the site, including 24 underground storage tanks (USTs), two

[7] At this time, the GSA memorandum indicates that the property had already been sold to a Mr. Towery in April 1979.

[8] The GSA report referred to the collection of samples of transformer oil and soil for PCB analyses, although the results were not provided in the documents available.

aboveground storage tanks (ASTs), a hydraulic cylinder containing oil, nine transformers, two abandoned disposal sites with visible drums, numerous buildings in various states of disrepair, and several open pits and sewer manholes (USACE 1991a). Further documentation indicated that the USTs, tanks, and disposal sites were eligible for DERP-FUDS funding (USACE 1991b, USACE 1991c), while the physical hazards from the damaged buildings and open sewers and manholes were not eligible for DERP-FUDS funding (USACE 1991d). Additionally, the documentation indicated that ACM was not addressed for the site (USACE 1991d).

The USACE prepared a Statement of Work (SOW) and Remedial Design (RD) for cleanup actions of the USTs, ASTs, transformers, and associated contamination (USACE 1995, GRI 1995). The SOW specified the removal of three USTs, two aerial storage tanks, six transformers, a PCB-stained floor, and additional hazardous materials. The RD documented PCB contamination in Building 200 (the radome) and near the transformer pad to the northeast of Building 207 (GRI 1995).

The cleanup work was performed by USACE's contractor between 1995 and 1997 (E. P. Johnson 1997). Items removed and disposed of during the cleanup activities included three USTs, two aerial tanks, six pole-mounted transformers, two contaminated floor drains, and associated contents, piping, and contaminated soil. The cleanup work also included the decontamination of PCBs from the metal floor in Building 200, the removal of 47 cubic yards (yd^3) of PCB-contaminated soil from the soil underneath Building 200, and the removal of 14 yd^3 of PCB-contaminated soil at a transformer pad near Building 207 (E. P. Johnson 1997). However, the removal of PCB-contaminated soil was not completed underneath Building 200, and an estimated 350 ft^2 [9] of the surface remained contaminated at levels above the ODEQ residential cleanup level of 0.08 milligrams per kilogram (mg/kg; E. P. Johnson 1997). In 1997, the USACE notified ODEQ that they had completed their cleanup work at the site, including the removal of several USTs and PCB-contaminated soil and debris (Jones 1998).

---

[9] The report only provided an estimate of the remaining surface area of PCB-contaminated soil. There was no volume estimate.

Over the course of the investigations and cleanup actions, the number of USTs estimated to be at the site changed[10]. Originally, 24 USTs were documented to be on site (USACE 1991a), while in later documents, USACE planned to remove nine USTs (Stockton 1994). Ultimately, the cleanup contractor reported removing three USTs from the site (E. P. Johnson 1997), although closure reports to ODEQ's UST Compliance Program only documented the closure of two (Jones 1997). In a trip report, the USACE reported that several of the tanks were missing from the site because of theft and vandalism (Todd 1993). Additionally, EPA's 1996 PA reported that the USACE had claimed that "all tanks . . . have been removed from the site" (URS 1996). Because of the discrepancy between the original number of USTs (24) on site and the number of USTs properly closed (two)[11], ODEQ's UST Compliance Program has raised concerns whether the other USTs were properly closed and whether contaminated soil remains on site (Roman 2002).

The USACE performed a limited remedial investigation of the two disposal sites in February 1995. A USACE memorandum reported that "the disposal sites were observed to be piles of non-hazardous debris which appear to have been pushed down the hillside" and that "they can be attributed to vandalism or illegal disposal activities by trespassers at this unsecured site subsequent to Air Force ownership of the property." The memorandum reported that the disposal sites were not located on the former Burns Air Force Radar Range property, although they did include debris from the site buildings. Based on these findings, the USACE determined that further investigation of the disposal sites was not warranted under DERP-FUDS. (Monson 1995)

Regarding ACM on site, DoD has stated that they are not responsible because the potential risks and hazards from the ACM are associated with damage to the buildings that occurred after they conveyed the property to others (Monroe 2004).

---

[10] The number of transformers estimated to be on site changed over time as well. Originally, there were estimated to be nine (USACE 1991a), while only six were specified in the cleanup SOW (USACE 1995). Ultimately, six were reported as being removed (E. P. Johnson 1997).

[11] In this context, "properly closed" means that documentation exists that the tank was removed and that a decommissioning report was filed to ODEQ. A third UST was reported to be closed (E. P. Johnson 1997), but the account of this closure was not included in the UST decommissioning report (Jones 1997).

EPA Preliminary Assessment, URS Consultants, August 29, 1996

In 1996, URS Consultants, Inc. conducted a federal PA at the site for EPA. The PA was performed "to document a threat or potential threat to public health or the environment" and was "intended to collect sufficient data to enable evaluation of the site's potential for inclusion on the National Priorities List (NPL)." The PA included a site description, a review of historical records (including USACE files), and an assessment of exposure pathways and potential targets (URS 1996). Based on the results of the PA, EPA decided not to investigate the site further under Superfund (Ader 1996).

ODEQ Site Investigations, 2002 and 2003

ODEQ visited the site in April, 2002, October 2002, and September 2003 to investigate the site and to collect bulk samples of suspect materials for asbestos and Toxicity Characteristic Leaching Procedure (TCLP) lead analyses. The results indicated that suspect site materials were ACM; pipe wrap and insulation contained between 10 to 60% amosite and chrysotile asbestos, cement asbestos board siding contained between 10 and 25% chrysotile asbestos, and floor tile and mastic contained between 5 an 8% chrysotile asbestos (ODEQ 2002a, ODEQ 2002b, ODEQ 2003b, ODEQ 2003c). These results are discussed further in Sections 3.2.2.2 and 4.1. During one of the site visits, ODEQ personnel posted "No Trespassing" and asbestos warning signs at the site (ODHS 2003).

Based on these site visits, ODEQ prepared a Focused Feasibility Study (FFS), which evaluated the remedial alternatives for the site. The FFS stated that the primary interim remedial action objective was to prevent human exposure to asbestos, and a secondary objective was to address the physical hazards at the site from the damaged buildings. The remedial action alternatives evaluated in the FFS included 1) no action; 2) fencing and stabilizing alternatives; 3) removal of asbestos, demolition of site structures, and disposal in an on-site landfill; and 4) removal of asbestos, demolition of site structures, and disposal in an off-site landfill. These alternatives were evaluated for several factors, including protectiveness, short- and long-term effectiveness, reliability, implementability, implementation risk, and cost. Based on these factors, the FFS identified alternative 3 (removal of asbestos, demolition of site structures, and disposal in an on-site landfill) as the preferred remedial option. (ODEQ 2003a)

Health Consultation, Oregon Department of Human Services, April 28, 2003

In 2002 and 2003, ODHS, in conjunction with the federal ATSDR, completed a health consultation to assess the health risks at the site from exposure to asbestos. During a visit to the site[12], ODHS personnel documented the presence of damaged friable ACM and physical hazards from damaged buildings and open pits. ODHS found that the damaged friable ACM at the site presented an inhalation health hazard to site workers, visitors, and trespassers. ODHS concluded that the site was a public health hazard and recommended a cleanup at the site to mitigate these hazards. ODHS also recommended that additional evaluations be performed to investigate potential contamination at two disposal sites[13] and the radome building. (ODHS 2003)

FAA Directional Finder Trip Report, Lockheed Martin, March 12, 2003

A site visit was performed by Lockheed Martin Technology Services (Lockheed Martin) on behalf of the FAA to "investigate reports of significantly damaged asbestos containing materials located in abandoned buildings that are adjacent to the FAA facility." The FAA operates a directional finder at the site near the location of building 220 (one of the former radomes). This site investigation was apparently performed because of concerns of potential asbestos exposure to FAA workers visiting the site. The Trip Report documented the presence of "significantly damaged friable and non-friable asbestos containing materials" in several structures on site, including floor tile, pipe and duct insulation, and cement-asbestos board siding. As a part of the site investigation, Lockheed Martin also collected an air sample near the entrance to the FAA facility. The air sample was analyzed for asbestos fibers by phase contrast microscopy (PCM), and the results were less than detectable limits. Despite these results, the Trip Report concluded that workers visiting the site could potentially be exposed to airborne asbestos fibers, and recommended that FAA employees not enter any of the abandoned buildings. (Lockheed Martin 2003)

BPA Investigations, 2003

In response to the ODEQ and ODHS investigations at the site, BPA investigated its facility (Building 230) for occupational exposure risks. BPA contracted a site investigation that included

---

[12] The ODHS site visit was conducted in conjunction with one of ODEQ's site investigations.

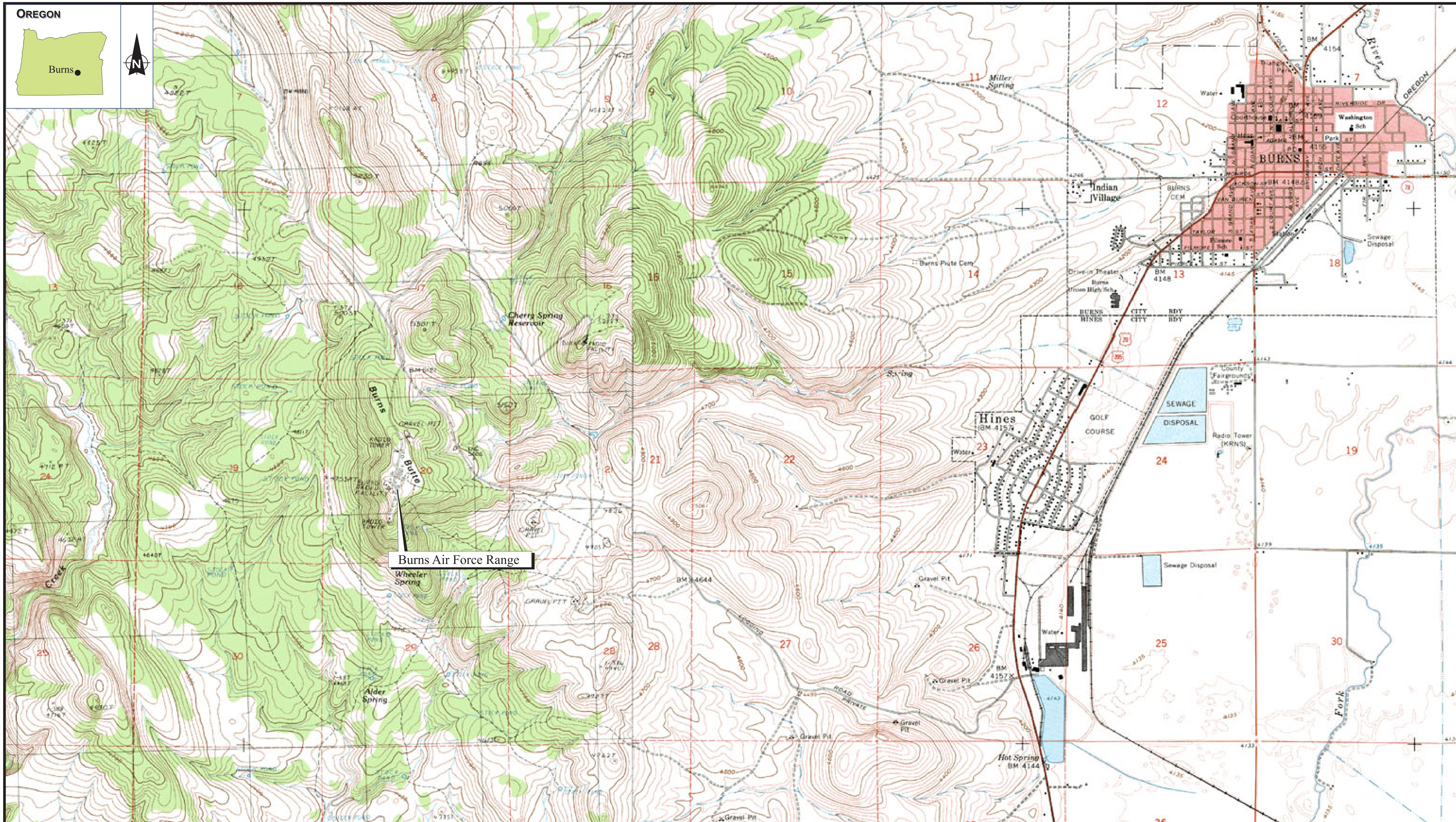
[13] The potential disposal sites that were documented by the USACE (USACE 1991a).

the sampling and analysis of 20 soil, paint, and bulk materials for asbestos and metals (arsenic, cadmium, chromium, lead, and mercury). The analytical results indicated that asbestos (chrysotile) was detected in two of the samples, presumably inside the BLM facility. Mercury, lead, and chromium were also detected in some of the samples inside the BLM property (Clayton 2003). Based upon the elevated mercury results, BPA contracted an industrial hygiene survey of the BPA facility, and the results indicated that mercury levels were below applicable workplace exposure limits (Marine & Environmental Testing, Inc. 2003). BPA requested that ODEQ include mercury as a contaminant of concern for their investigation of the site (Walsavage 2003).

EPA Removal Site Evaluations, November 2002 and May 2004

At the request of ODEQ, personnel from EPA's removal program visited the site in 2002 to investigate the presence of friable asbestos and PCB contamination. The site walk was performed on November 7, 2002, by OSCs Dan Heister and Marc Callaghan and a START-2 contractor. During the site walk, EPA documented the presence of friable asbestos in the damaged and vandalized buildings, and documented a potential exposure risk for workers visiting the active communication facilities. Following the site walk, EPA offered to assist ODEQ in stabilizing the site. (EPA 2004). At the time, ODEQ indicated that they would address the site under their Orphan Sites Program (Monroe 2004).

In April 2004, ODEQ requested removal support from EPA. ODEQ specifically asked EPA to address the removal of asbestos at the site, while ODEQ agreed to pay for the disposal of non-hazardous construction debris and scrap metal associated with the RA (EPA 2004). EPA conducted a site walk on May 10 and 11, 2004, to prepare for the RA. The participants included OSC Szerlog, Dave Anderson of ODEQ, and representatives from EPA's ERRS and START-2 contractors. During the site walk, START-2 collected samples of bulk materials for asbestos analysis to further characterize the site. These results are discussed in Sections 3.2.2.2 and 4.1. Based on the site walk and ODEQ's request for removal support, EPA decided to perform an RA at the site (EPA 2004).



ecology and environment, inc.

International Specialists in the Environment
Seattle, Washington

Source: Maptech, Inc. 2001.

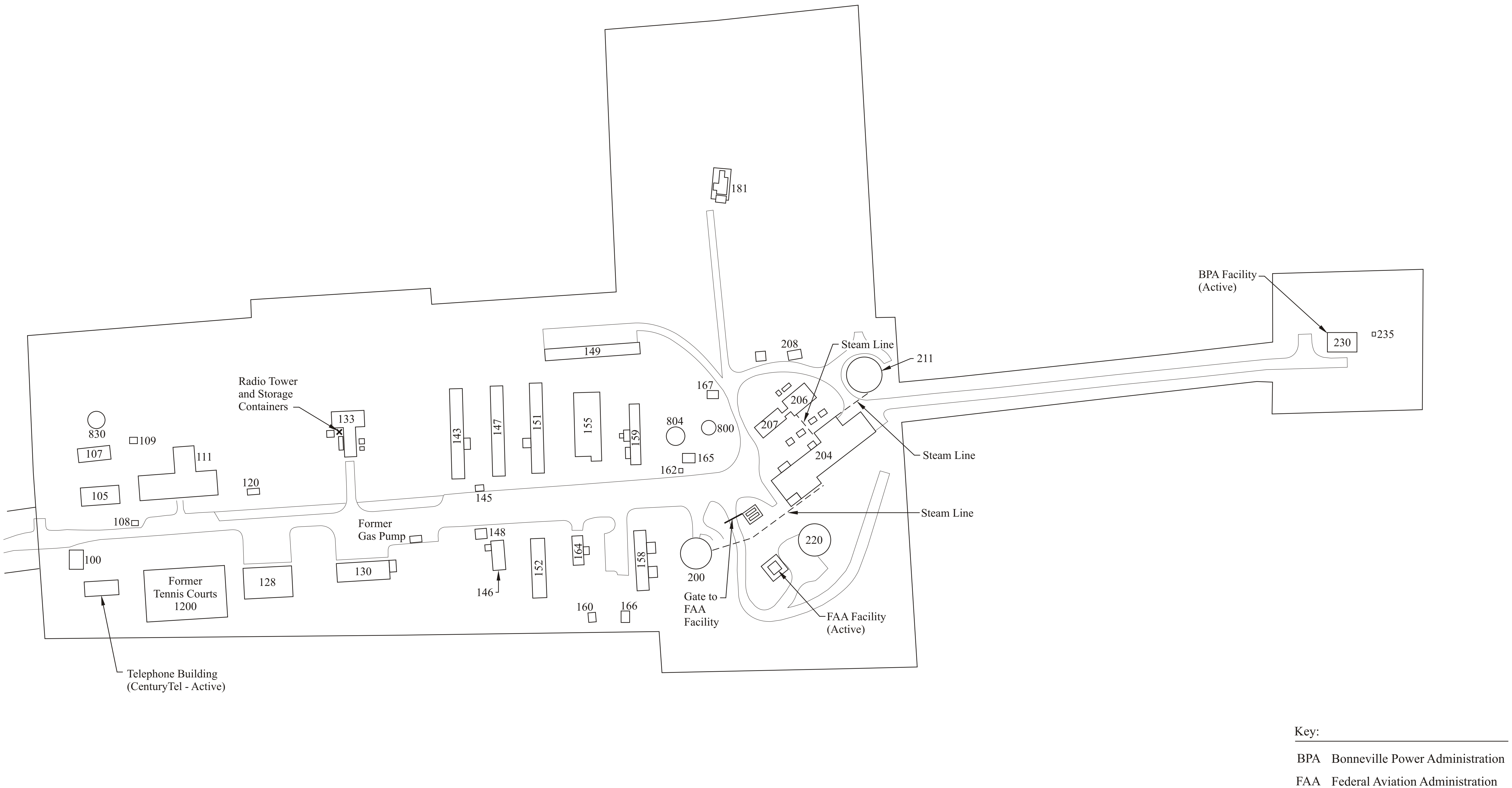
0 1333 2666
Approximate Scale in Feet

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

Figure 2-1

REMOVAL ACTION REPORT
SITE LOCATION MAP

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\fig 2-1



ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

0 100 200
Approximate Scale in Feet

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

Figure 2-2
REMOVAL ACTION REPORT
SITE LAYOUT

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\fig 2-2

3. REMOVAL ACTIVITIES

EPA performed a time critical RA at the site in June and October 2004[14]. The RA was performed to mitigate the threats of CERCLA hazardous substances at the site, including asbestos and PCBs, in accordance with the National Contingency Plan, 40 CFR Part 300. Participating groups in the RA included ODEQ, ERRS, START-2, and the United States Coast Guard (USCG) Pacific Strike Team (PST).

This section describes the objectives and strategies of the RA (subsection 3.1), discusses the actions taken during the RA (subsection 3.2), and provides a chronology of events that occurred over the course of the RA (subsection 3.3).

3.1 REMOVAL ACTION OBJECTIVES AND STRATEGIES

The primary objective of the RA was to mitigate the threat from exposure to asbestos caused by the damaged and vandalized site buildings. To achieve this goal, EPA removed and properly disposed of ACM at the site, including ACM still present in the on-site buildings and damaged ACM strewn about on the ground. Friable ACM (including pipe, duct, and boiler insulation) was removed from the site buildings by a state of Oregon certified abatement contractor. Following abatement of friable asbestos, non-friable asbestos was addressed. Most non-friable asbestos (e.g., CAB siding and floor tile) was attached to damaged walls and floors in the site buildings. Because the buildings were structurally unsound and in imminent danger of collapse, EPA ordered the demolition of these buildings with non-friable asbestos, in accordance with the National Emission Standard for Asbestos (40 CFR Part 61). Demolition debris that contained non-friable ACM was segregated from non-ACM demolition debris. All ACM waste, including friable ACM and ACM demolition debris, was transported off site for proper disposal in licensed landfills.

A secondary objective of the RA was to remove PCB-contaminated materials that remained after the USACE cleanup activities in the 1990s. USACE reports documented that PCB-contaminated soil remained at the site underneath Building 200 (the radome building). Additional PCB contamination was found on the steel beams and panels of Building 200 and in surface soils near former transformer pads

[14] The primary phase of the RA was performed from June 10 through July 3, 2004. EPA returned to the site from October 11 through 15, 2004, to complete the RA.

near Buildings 133 and 206. As a part of the RA, Building 200 was demolished to allow access to the PCB-contaminated soils underneath. PCB-contaminated steel was segregated and disposed of along with the contaminated soil.

To meet the objectives of the RA, the OSC assigned specific tasks to ERRS, START-2, and the PST. The scope of work for the ERRS contractor was divided into the following phases of work:

- Mobilize to the site with work crew, equipment, and supplies;
- Establish temporary office trailers, utilities, and sanitary facilities;
- Provide temporary site security;
- Arrange for the removal and disposal of friable ACM from the site;
- Demolish site buildings and dispose of demolition debris (ACM and non-ACM debris);
- Excavate and dispose of PCB-contaminated materials; and
- Excavate and dispose of ACM steam line.

The START-2 scope of work for the RA included the following activities:

- Survey site buildings for ACM;
- Perform ambient air monitoring for asbestos fibers during removal activities;
- Collect soil and wipe samples for PCBs;
- Perform field testing for PCBs;
- Provide technical assistance to EPA; and
- Document site activities.

The PST performed health and safety monitoring and provided site security during daily field activities. The PST also provided technical assistance as directed by the OSC.

3.2 REMOVAL ACTIONS

The RA was accomplished by completing a series of steps:

1. Site Mobilization and Preparation
2. Site and Building Surveys
3. Friable Asbestos Abatement
4. Building Demolition
5. Ground Clearing for ACM Debris
6. Removal of ACM Steam Lines
7. Ambient Air Monitoring
8. PCB Contamination
9. Waste Transportation and Disposal (T&D)

In general, these steps were not performed in discrete phases, and several steps were often performed concurrently at different areas of the site. Overall, these steps describe EPA's systematic approach for the RA.

3.2.1 Site Mobilization and Preparation

EPA and its contractors mobilized to the site on June 10, 2004. Participating groups included EPA, ERRS, START-2, and the USCG PST. Once on site, ERRS received the equipment and temporary facilities necessary to perform the RA. A command post was established on the former tennis courts of the site (number 1200 on the site figure; See Figure 3-1). The command post consisted of two temporary office trailers, a break-room trailer for workers, and parking for vehicles. Temporary utilities, including electricity and telephone lines, were installed in the office trailers, and temporary sanitary facilities were set-up in several locations on site.

During mobilization, ERRS also received the heavy equipment for the RA, including two excavators with buckets, one excavator with a shears attachment, and two Bobcat uni-loaders. ERRS also placed a temporary AST on site to hold fuel for the heavy equipment. The AST was staged on a spill pad and berm on the concrete pad at the former location of building 128.

Throughout the RA, EPA also addressed site security. During the site working hours (typically 7 AM to 7 PM), site security was maintained by the PST. For the non-working hours, ERRS subcontracted with a local private security company to provide site security.

EPA and ERRS contacted local utility companies who visited the site and marked the location of live utility lines (including underground and overhead). ERRS also subcontracted with a private utility locator to look for potential buried utility lines in areas where excavation was planned, including Building 200 and the paths of the two buried steam lines (between Buildings 200 and 204 and Buildings 211 and 204).

3.2.2 Site and Building Surveys

Before friable asbestos abatement or demolition began, several site surveys were completed to document site conditions and to better define the scope of work. They included a survey of building types, asbestos inspections, historical documentation, and a survey for nesting migratory birds. In general, these surveys were performed by the OSC and START-2.

3.2.2.1 Building Types

At the time of the RA in June 2004, the site included 25 abandoned buildings, two abandoned water tanks, and a former water well. There were also approximately 11 buildings that had already been demolished or were otherwise missing and that were represented by remaining concrete slabs, foundations, or demolition debris piles. The three active facilities, including the Telephone Building

(CenturyTel), the FAA Directional Finder (near Building 220), and the BPA facility (the land around Building 230), were not included in the RA.

Figure 3-1 presents the site layout at the start of the RA and includes the location of abandoned buildings and structures, buildings no longer present, and active facilities. Figure 3-1 also indicates the approximate boundaries of the original station and the RA site. Table 3-1 includes a list and description of the site buildings at the time of the RA.

The survey of building types was performed by visual observations made during site walks and reviews of historical documents from the USACE (ODEQ 2003a; Roberts 1971; Lau 1971). This information was important to obtain for each building because the construction type, along with the type of ACM present, influenced the demolition methods used by ERRS. For the purposes of this RA, the following building construction types were identified:

- **Wood Frame** These buildings were built with wood wall studs and had exterior siding composed of CAB shingles. The floors were typically composed of wood studs with particle board or plywood subfloors, although some had sections with a concrete slab. Examples: Buildings 100, 105, 111, 160, and 166.
- **Metal**[15] These buildings were composed of steel beams and corrugated sheet metal siding. Floors were typically concrete slab. Examples: Buildings 130, 155, and 207.
- **Quonset Huts** These buildings were essentially the same as the metal buildings, with the primary difference that the Quonset huts had arched roofs, while the metal buildings had flat roofs. Floors were either wood or concrete slab. Examples: Buildings 143, 147, and 151.
- **Concrete Block** These buildings were constructed of cement masonry units (CMU) or concrete blocks, and they typically had concrete slab floors. Examples: Buildings 204 and 206.
- **Radome** These buildings were used to house and support radar antennae and associated equipment. Each radome was constructed as a regular dodecagon (twelve-sided polygon) with steel beams and corrugated metal exterior siding. The foundation was constructed of concrete footers and steel beams supporting a steel panel floor over bare dirt. At one time the Burns Air Force Radar Range had three radomes, including Buildings 200, 211, and 220. Two of the radomes (211 and 220) were demolished prior to the removal action, with only

[15] The "Metal" buildings are often described as "Butler-type" buildings in historical documents (Roberts 1971).

the concrete footings and foundations remaining. The third radome (200) was present at the beginning of the RA.

Figure 3-1 and Table 3-1 indicate the building construction types for each site building.

3.2.2.2 Asbestos Surveys

ODEQ and START-2 performed several rounds of asbestos surveys at the site. ODEQ's surveys were performed during their site investigations in 2002 and 2003. ACM identified at the site by ODEQ included pipe insulation, floor tile, and cement-asbestos board siding.

START-2 performed asbestos surveys during the EPA site walk in May 2004 and during the RA to confirm ODEQ's results and to further assess building materials for the presence of asbestos. During the site surveys, START-2 observed suspect ACM in the site buildings and scattered on the ground around the buildings. START-2 also collected bulk samples of suspect building materials for asbestos analysis by PLM. Results obtained for START-2 samples confirmed that many of the materials were ACM. A detailed discussion of the samples and PLM results is presented in Section 4.1.

In general, the results from ODEQ's and START-2's asbestos surveys indicate that three main types of ACM were present in large quantities on site:

- TSI: pipe and boiler insulation, including insulation in the steam line;
- ACM floor tile[16] and associated mastic; and
- Cement-asbestos board (CAB) siding.

All of the site buildings contained some type of ACM, with the exception of building 181, the wastewater treatment plant. Additionally, other types of ACM were occasionally detected in smaller quantities in the site buildings, such as glazing, caulk, boiler gaskets, and tar paper.

Based on the results of these surveys, any friable ACM present in a site building was identified and abated prior to demolition. The survey results also identified which building materials contained non-friable ACM, so that ACM debris could be properly segregated from non-ACM debris during demolition and waste loading.

---

[16] Also known as vinyl asbestos tile (VAT).

3.2.2.3 SHPO Photographs

During a review of applicable or relevant and appropriate requirements (ARARs) in preparation of the RA, the OSC determined that the site may be eligible for the National Register of Historic Places (NRHP; EPA 2004). The OSC consulted with the Oregon State Historic Preservation Office (SHPO), who requested that EPA complete and submit a Section 106 Documentation Form for compliance with the requirements of the NRHP (16 U.S.C. 470 et seq.) Copies of the completed and submitted SHPO forms are included in Appendix B. The SHPO agreed that the site was potentially eligible for the NRHP and requested that prior to demolition of any site building EPA photo-document the site and the site buildings in detail with 35 millimeter, black and white film (Ranzetta 2004). As directed by the OSC, START-2 performed this photo-documentation of the site buildings prior to demolition. EPA then provided the SHPO with the requested photographic negatives and contact sheets following the conclusion of the RA.

3.2.2.4 Bird Surveys

An issue that arose during the RA was the presence of nesting, migratory birds in the site buildings. The site is located within a migratory bird flyway near the Malheur National Wildlife Refuge, and the Migratory Bird Treaty Act (MBTA) was determined to be an ARAR for the site (EPA 2004). During the RA, EPA adhered to the requirements of the MBTA.

During the RA, numerous bird nests with eggs and/or nestlings were observed in the site buildings. The ceilings and walls (interior and exterior) of the site buildings had many holes caused by vandalism and shotgun blasts. Nests from several species of cavity-dwelling birds were observed inside these man-made holes.

The OSC and START-2 performed several rounds of thorough surveys of each site building to be demolished for the presence of nesting birds. Bird species identified at the site included mountain blue bird, house finch, Brewer's sparrow, flicker, robin, and American kestrel. In accordance with the MBTA, EPA could not allow the killing or taking of the birds. Because demolishing a building with an active bird nest would constitute killing, demolition would have to be postponed until the nestlings had fledged from the nest and the buildings were demonstrated to be free of nesting birds. EPA had spent thousands of dollars to mobilize personnel and equipment to the site, thus postponing the RA would have been cost-prohibitive.

The OSC conferred with officials from the United States Fish and Wildlife Service (USFWS) and the Oregon Department of Fish and Wildlife (ODFW) regarding the proper response to the nesting birds. Together, these agencies worked to identify a solution that was protective of the birds, nestlings, and eggs, and that would also allow site work on the time-critical RA to proceed. USFWS and ODFW recommended that the bird nests be removed and delivered to a local, certified bird rehabilitator.

The OSC and START-2 performed two rounds of bird recovery on June 14 and June 18. The birds were recovered in a way to minimize the disruption to the bird nests. Personnel handling the bird nests wore disposable nitrile gloves, and contact with the birds and nests was minimized. After recovery, the nests were secured in boxes and were then immediately driven to a rendezvous with ODFW personnel, who transferred the nests to Lynn Tompkins of Blue Mountain Wildlife, in Pendleton, Oregon, a certified bird rehabilitator.

Table 3-2 describes the birds and bird nests that were recovered on June 14 and June 18. Note that the nests of some birds that had been previously observed were not recovered, because the nestlings had fledged prior to the scheduled removal (e.g., the flicker).

Toward the conclusion of the initial phase of the RA in June 2004, additional bird nests were observed in buildings 204, 206, and 181. These buildings were demolished by ODEQ during the October 2004 phase of the RA, after which time the nestlings had fledged.

3.2.3 Friable Asbestos Abatement

Prior to demolition, friable ACM was abated from each site building. Friable ACM was generally in the form of TSI (pipe and boiler insulation), although some non-friable ACM was also removed by the abatement contractor, depending on building-specific conditions. For example, the abatement contractor removed non-friable VAT from concrete slabs, because the concrete slabs were not demolished and were left on site.

ERRS subcontracted with two state-certified abatement contractors for the friable asbestos abatement. The two contractors were Alpine Abatement Associates, Inc. (Alpine) and Cascade Insulation, Inc. (Cascade), both of Bend, Oregon. These contractors used state-certified abatement supervisors and workers. Either Alpine or Cascade was present on site during each day of abatement or demolition activity.

Abatement of friable ACM for each site building followed the following general procedures. START-2 marked the location of friable ACM in each building and performed a building-specific walk with the abatement supervisor prior to abatement. During abatement, the contractors used wet removal methods with surfactant-amended water. As much as possible, friable ACM was wrapped in place with 6-mil polyethylene sheeting or bags, kept adequately wet, and removed in such a way as to limit the disturbance of ACM. Glove bags were used as necessary when ACM needed to be disturbed or cut in place. Because the buildings were to be demolished, TSI ACM abatement usually involved the removal of entire sections of the pipe and ACM, rather than removal of the ACM from the pipes. Following the removal of ACM, the contractors cleaned the substrates by scraping, brushing, and/or wet wiping to remove visible evidence of ACM. Friable ACM waste was double bagged with 6-mil polyethylene bags, labeled as asbestos waste, and placed inside 20 yd^3 roll-off containers with lids and gaskets for off-site transportation and disposal.

Large pieces of equipment with ACM, such as boilers or water tanks, were wrapped in place with 6-mil polyethylene sheeting and removed in one piece, whenever possible. Some of these objects were too large to be removed by hand; therefore, a section of the wall or ceiling was removed and the wrapped object was lifted out by heavy equipment.

For abatement of certain buildings, the abatement contractor used critical barriers and negative air enclosures with high efficiency particulate air (HEPA) filters to further contain potential airborne asbestos fibers during abatement. These methods were used for buildings that either contained large quantities of friable asbestos or that had sustained fire damage. Critical barriers and negative air enclosures were used in Building 159, Building 204, and the boiler room of Building 155.

During the abatement or demolition of each building, an exclusion zone was established at a minimum of a 10-foot perimeter around buildings, and this exclusion zone was adjusted depending on site and wind conditions. Anyone entering the exclusion zone was required to meet the site health and safety requirements, including the use of proper personal protective equipment (PPE). For abatement, work, the PPE level was established as Level C, including respirators with HEPA cartridges, coveralls, hard hats, and safety shoes.

Following abatement of each building, START-2 performed a visual inspection to determine whether the building was ‘cleared’. In the event that START-2 observed friable ACM remaining in the building, the abatement contractor was required to complete the abatement. In general, clearance testing[17] was not performed in most buildings, because the buildings were to be demolished following

---

[17] Clearance testing is a procedure required by the Asbestos Hazard Emergency Response Act (AHERA; 40 CFR Part 763) to determine that an abated room or building is sufficiently free of asbestos fibers that it is safe to reoccupy. Following a successful visual inspection of the work area, clearance testing is performed by collecting air samples inside the work area and then analyzing them for asbestos fibers by PCM or TEM. If the sample results are less than the AHERA clearance limit (0.01 f/cc for PCM, 70 structures per square millimeter [s/mm^2] for TEM), then the work area has passed clearance testing.

abatement and were not intended for re-occupation. Therefore, these abated buildings were maintained as exclusion zones through demolition. Clearance testing was performed for two buildings that required critical barriers and negative air enclosures, including Building 204 and the Building 155 boiler room. For both of these buildings, the results of the air sampling were less than the AHERA clearance standard of 0.01 fibers per cubic centimeter (f/cc; 40 CFR Part 763), as determined by PCM in accordance with National Institute for Occupational Safety and Health (NIOSH) Method 7400. More details about the air sampling and clearance testing are presented in Section 4.2.

Throughout the project, the abatement contractors maintained a certified asbestos supervisor and certified asbestos workers on site. A certified asbestos worker participated in building demolition to perform any task that involved the handling of ACM, including the proper removal of any friable ACM that may have been inaccessible during the abatement.

3.2.4 Demolition

Following abatement of friable ACM, ERRS demolished most of the site buildings. The buildings were demolished to safely remove non-friable ACM (CAB siding and floor tile) or to access PCB-contaminated soils. EPA and ODEQ shared the costs of building demolition at the site, with EPA bearing the responsibility for any demolition necessary to address CERCLA hazardous substances, and ODEQ bearing the responsibility for the demolition of buildings that were only physical hazards. ODEQ contracted with EQM, the ERRS contractor, for the building demolition relating to physical hazards, and EQM performed both demolition types during the same field work events to save mobilization costs.

With the exception of a portion of Building 133, all of the abandoned site buildings still intact at the beginning of the RA were demolished. For Building 133, the Quonset Hut half was demolished, while the concrete block section, which was being used to support an active ham radio antenna, was not disturbed. Additionally, some buildings had been previously demolished prior to the RA, with the demolition debris remaining on site (e.g., Building 208). Demolition debris from these former buildings were included in the waste loading and off-site disposal.

A summary of the buildings demolished at the site, and the responsible agency, is provided below. Note that many of the buildings that were demolished for ODEQ did contain friable ACM that was abated by EPA. Figure 3-2 shows the site after the RA, and buildings that were demolished during the RA are indicated by dotted lines.

Summary of Building Demolition
EPA Responsibility (related to removal of CERCLA hazardous substances):
100, 105, 109, 111, 133 (Quonsut Hut section), 143, 146, 147, 149, 151, 152, 158, 159, 160, 164, 166, 200, 207, and 208 (already demolished; ACM debris was disposed)
ODEQ Responsibility (physical hazards only):
130, 155, 165, 181, 204, 206, Paint Shed near 208, Tank 804, and Tank 800 (not demolished; manhole was covered)
Not Demolished:
133 (concrete block section - currently used to support a ham radio antenna), Tank 800, and Water Well 830 The following buildings are active facilities that were not part of the site, and therefore not demolished: Telephone Building, FAA Directional Finder (near Building 220), Building 230 (BPA)

Demolition was performed by ERRS equipment operators using heavy equipment, including two track excavators with bucket and thumb attachments and one track excavator with a shears attachment. ERRS also used a 4,000 gallon water truck and a trailer-mounted water tank with water hoses for dust suppression.

Building demolition was performed by a crew that typically included the ERRS foreman, at least one ERRS equipment operator (excavator and/or shears), an ERRS laborer who operated the hose from the water truck, and one asbestos worker in the event that friable ACM was discovered in the debris. Typically, one of the PST members was also present during demolition as a health and safety observer. Prior to demolishing each building, the crew conducted a building-specific health and safety meeting to delineate the exclusion zone, to develop a demolition strategy, and to discuss safety considerations, including wind direction and speed.

During demolition, ERRS took care to minimize the disturbance to the materials and the potential generation of airborne dust. For example, for the wood-frame buildings, the operators carefully pushed the walls and buildings materials into the building to try to maintain the demolition debris on the footprint or foundation of the building. This method was used to prevent the spread of demolition debris, and especially ACM debris, to the surrounding ground surface. Throughout the demolition, the water truck operator sprayed water on the debris to suppress dust.

For the metal buildings or Quonset Huts, non-friable ACM present at the time of demolition was generally VAT, which was attached to the wooden floor. For these types of buildings, the ERRS operators used the shears to cut the metal studs of the walls and then pulled the walls and roof off of the building. By doing so, the ACM VAT on the wooden floor substrate was kept on the footprint / foundation of the building. The non-ACM debris was stockpiled to the side for later loading and T&D.

After the bulk of each building was demolished, the ERRS operators used the excavators to size the material down for easier loading. The operators sized the materials by 'crunching' with the jaws of the excavators to reduce the size of the debris so that loading of the material would be easier. During this time, ERRS also segregated the demolition debris into different piles, depending on the contents: ACM debris, non-ACM debris, and salvageable steel.

Most site buildings were demolished down to the foundation, although demolition did not include the foundation. Most of the site buildings were either built on a concrete pad or a concrete block foundation, and they were demolished and cleared so that only the foundation or concrete pad remained. Two concrete block buildings, Buildings 204 and 206, were demolished in place (on behalf of ODEQ), and crushed piles of concrete and debris were left on the original concrete slab foundations.

Following demolition and debris sizing, an ERRS operator used an excavator to load the demolition debris into appropriate waste containers. Demolition debris with non-friable ACM was loaded into lined 54 yd^3 boxes. In accordance with the request from ODEQ's Air Quality Branch (Frank Messina), the boxes were lined and the debris wrapped in such a way as to prevent fiber release during transportation. Upon arrival at the site, ERRS laborers lined the empty boxes with polyethylene sheeting. After the box was loaded with the ACM demolition debris, ERRS secured the loose ends of the polyethylene sheeting over the top of the box. The boxes were further covered by tarps before leaving the site.

Debris without ACM ('clean' demolition debris) was loaded into unlined end-dump trucks for off-site transportation and disposal. The scrap steel was set aside into piles, and a steel scrapper (Wurdinger Recycling, Inc.) consolidated the scrap for off-site recycling. Additional information about waste transportation and disposal is provided in Section 3.2.10.

3.2.5 Ground Clearing for ACM Debris

Throughout the demolition, sizing, and debris loading process, ERRS repeatedly scanned the ground around the perimeter of each building to pick up loose pieces of debris, especially small pieces of non-friable ACM such as VAT or CAB siding. During the RA, the OSC and START-2 observed that many small pieces of non-friable ACM were scattered around the perimeter of most buildings. Some of this debris was scattered on the ground during the demolition, but much of it was already present prior to the RA because of building neglect and vandalism[18]. It was also observed that these small pieces of ACM debris were easily covered by the sandy site soil. Additionally, it was observed that once an area of the ground was cleared of these small ACM debris pieces, additional pieces that were buried would eventually resurface.

As directed by the OSC, a priority was placed upon trying to recover as much of these small ACM debris pieces as possible, within the project schedule. Each building site was cleared by asbestos workers and ERRS laborers following building demolition. At the end of the June phase of the RA, ERRS performed an additional sweep of the entire site to pick up additional pieces that may have resurfaced since the initial clearing. During the final phase of the RA in October 2004, the OSC and START-2 observed additional pieces of ACM that had resurfaced since the beginning of July. Again, ERRS systematically cleared the ground around the foundation of each building to remove this resurfaced ACM debris.

During the October 2004 phase, the OSC and START-2 addressed the issue of resurfacing ACM debris. Because the site was so large, the OSC decided to establish several small test plots to further evaluate the resurfacing process. The goal was to define specific ground areas on site that would be cleared of visible ACM debris at the surface. Then, those areas could be re-evaluated in the future to determine to what degree, if any, additional ACM debris had risen to the surface from the resurfacing process.

A total of seven test plots were established at various locations on the site. The sites were selected from areas of fairly heavy ACM debris pieces near or inside the foundations of a variety of different building types. Each test plot was six feet by six feet, and its specific location relative to the adjacent building was determined and recorded. START-2 collected detailed photographs of each test

---

[18] There was evidence that site trespassers often used the 12" x 12" floor tiles (VAT) or CAB siding panels as objects to throw around or as shooting targets.

plot with the surface ACM debris present, and then ERRS cleared the area of surface debris[19]. Following clearing, START-2 collected similar post-clearing photographs. The locations of these test plot areas are indicated on Figure 3.3.

3.2.6 Removal of ACM Steam Line

In addition to the ACM in the site buildings, there were several steam lines on site that contained friable ACM. As a part of the RA, these steam lines were also removed from the site for proper disposal.

Based upon observations at the site, it appears that four separate steam lines were originally installed between the boiler room of Building 204 and the three radome buildings (Buildings 200, 211, and 220) and Building 206. At the time of the RA in 2004, some sections of steam line remained as originally installed, while other sections were broken and laying on the ground (see Figure 3.4). The steam line between Buildings 200 and 204 (166 feet of two 8-inch diameter pipes) included an underground section at the driveway to the FAA facility, and this steam line was mostly intact except for its connection to the former Building 204 boiler room, which had previously been demolished. The steam line between Building 204 and Building 211 (a former radome, that had previously been demolished) was completely intact and mostly underground (65 feet of two 8-inch diameter pipes). One steam line was observed at roof height at Building 206 (30 feet of one 8-inch diameter pipe). This pipe had apparently been attached at a similar height on Building 204, although it had fallen from Building 204 by the time of the RA. No intact steam line was observed between Building 204 and Building 220 (a former radome, that had previously been demolished), but several sections of steam line were observed on the ground at Building 204 (approximately 50 feet of 6-inch diameter pipe) and on FAA property inside the foundation of Building 220 (approximately 30 feet of 13-inch diameter pipes). It appears that these steam lines had been installed aboveground, with no apparent underground section. An additional section of ACM steam line (approximately 10 feet) was observed on BLM property to the northeast of the site.

The steam line pipes were typically constructed with one 2-inch diameter inner metal pipe, a middle layer of asbestos (typically amosite; see Section 4.1) wrapped in ACM tar paper, and an outer layer of corrugated metal. The cross section of the typical steam line was typically 8 inches, and two of these steam line pipes were installed in parallel along the typical steam line path. There was no apparent

[19] ERRS cleared the entire site of surface ACM debris as part of the RA, but specific attention was also provided to the test plots.

difference in construction between the aboveground and underground steam lines. Because of the very friable amosite insulation inside, the entire steam line was handled and disposed of as friable ACM.

The steam lines were removed for disposal by a combined crew of ERRS equipment operators and asbestos workers. For the aboveground steam lines, an ERRS operator used the shears attachment to cut the steam line. This method was very effective at cutting the steam line while minimizing fiber release because the shears attachment pinched the corrugated metal sheath together prior to cutting it so that the cut end was constricted. While the shears was cutting the steam line, the pipe was sprayed with water in case dust or fibers were released. Asbestos workers then wrapped the cut ends of the steam line with 6-mil polyethylene sheeting and duct tape to seal them. In this manner, the steam line was cut into short, manageable sections, typically about 10 feet long. Once a section of steam line was cut and wrapped, ERRS picked up the section with an excavator and set it aside in a stockpile. Later, the wrapped sections of steam lines were placed in a 20 yd^3 roll-off box for off-site disposal with the rest of the friable ACM.

For the sections of steam line that were underground[20], ERRS excavated down to the steam pipe so that they were accessible for removal. In general, ERRS used excavators to break apart the asphalt (if present), and then used a Bobcat excavator to excavate down to the steam line. The steam line was typically 2 to 4 feet bgs. Excavated soil was stockpiled to the side of the excavation. Once the steam line was uncovered, an excavator with thumb attachment lifted the steam pipe to the surface, where it was cut and wrapped by the shears excavator and asbestos workers as described above.

After the steam line was removed from the trench, the trench was backfilled. Backfilling was performed by replacing the excavated backfill and tamping it down with the bucket of a Bobcat excavator. In general, soil was replaced in 1-foot lifts, and the soil was compacted thoroughly. A few weeks later , the asphalt was replaced on the driveway to the FAA facility and the driveway between Buildings 211 and 204.

ERRS and abatement workers also removed the ACM steam lines observed on FAA and BLM properties. The ACM steam line on the FAA property was observed inside the foundation of Building 220 (a former radome). The ACM steam line on BLM property was located near a historic gravel pit (Maptech 2001) that had become a dumping site for trash and debris.

---

[20] The steam line was constructed the same way above and below ground.

3.2.7 Air Monitoring

A primary concern for the RA was to minimize the release of asbestos fibers during abatement and demolition. Throughout the RA, EPA used a variety of engineering and management controls to minimize the release of asbestos fibers. In addition to these control methods, START-2 performed daily ambient air monitoring during the RA to determine if asbestos fibers where being released. Sampling was performed on a daily basis near the locations of daily abatement, demolition, and loading activities. The samples were analyzed daily on site, and a percentage were also submitted for confirmation analyses at an off-site laboratory.

A detailed discussion of the START-2 air sampling and analyses is presented in Section 4.2. In summary, the results indicated that the RA activities were conducted in a manner that was safe, effective, and protective of human health and the environment.

3.2.8 PCB Contamination

As a part of the RA, EPA also investigated and addressed PCB contamination at the site. Documents from the USACE indicated that PCB contamination remained inside and underneath Building 200 (radome). The USACE documents also indicated that transformers had been located near other site buildings (133, 204, and 206) where documentation was incomplete regarding possible PCB spills or investigation work[21]. The areas of interest with regard to possible PCB contamination are indicated on Figure 3-5.

The OSC directed START-2 to determine the extent of PCB contamination in these areas. START-2 investigated soil and building materials (steel beams and floor panels) in Building 200 and soil near Building 133, 204, and 206. The methods and results of START-2's PCB sampling investigation are presented more thoroughly in Section 4.3. To summarize, START-2 collected soil and wipe samples and tested them in the field with Ensys PCB immunoassay field test kits. A subset of the soil samples were also submitted to a commercial laboratory to confirm the results of the field testing. START-2 determined that PCB contamination was present on some of the steel beams and plates in Building 200, at concentrations greater than 10 micrograms per 100 square-centimeters ($\mu g/100\ cm^2$), and in the soil underneath Building 200, with concentrations as high as 145 mg/kg. PCB contamination was also detected in surface soils near Buildings 133 and 206, at concentrations greater than 1 part per million

---

[21] The USACE did document the removal of 14 yd^3 PCB-contaminated soil near Building 207 (E. P. Johnson 1997).

(ppm). PCB contamination was not detected near Building 204. Based on the results of the START-2 investigation, ERRS removed and disposed of the PCB-contaminated materials as described in the following sections.

3.2.8.1 Building 200

In Building 200, the USACE's cleanup contractor decontaminated the steel floor and excavated 47 yd^3 of PCB-contaminated soil for off-site disposal. However, the cleanup report also documented that approximately 350 ft^2 of PCB-contaminated soil (above the then ODEQ residential standard of 0.08 mg/kg) remained underneath Building 200 (E. P. Johnson 1997).

To further investigate this, START-2 collected soil and wipe samples and analyzed them in the field with Ensys PCB field test kits. More details about these samples and the field test kit results are provided in Section 4.3. The action level for PCB contamination in soil was established at 1.2 mg/kg, which is the ODEQ PCB Remedy Standard for residential soils (ODEQ 1997). Ensys test kits were used with 1 ppm detection limits to compare the results to this action level. The results indicated that PCBs at a concentration greater than 1 ppm were present in the soil underneath Building 200. Additionally, wipe samples from some areas inside the building were also positive (greater than 5 or 10 $\mu g/100\ cm^2$). The results were consistent with the USACE documentation, which indicated that PCBs had leaked from a transformer on the second floor to the first floor and the soil underneath.

Based upon these results, START-2 delineated the areas of soil contamination and marked PCB-contaminated steel beams and floor panels inside Building 200. For Building 200, the PCB-contaminated soil was located underneath the building, so the building required demolition to excavate the soil. Prior to demolition, ERRS tried to decontaminate the PCB-contaminated steel beams and floor panels with a cleaning solution of Simple Green™, a commercially-available detergent. Following this procedure, START-2 collected additional wipe samples and tested them with the field test kits, and the results indicated that PCB contamination was still present. Therefore, no further decontamination was attempted, and ERRS segregated demolition debris into PCB and non-PCB piles as Building 200 was demolished. The non-contaminated steel was left in a pile for the metal recycler, and the PCB-contaminated steel was staged for off-site T&D at a Toxic Substances Control Act (TSCA)-approved facility.

Once Building 200 had been demolished, ERRS excavated the PCB-contaminated soil inside the foundation[22]. ERRS excavated approximately 1 to 2 feet of soil in the area of contamination in the center of the foundation and stockpiled it to the side. Following the first round of excavation, START-2 collected additional soil samples from the surface of the excavated area and tested them with the field test kits. The results indicated that some of the soil samples were still contaminated with PCBs, so ERRS excavated additional soil in the area of contamination. This sequence was repeated several times in the foundation of Building 200: ERRS excavated approximately 1 to 2 feet of contaminated soil and stockpiled it to the side, START-2 collected additional soil samples from the surface of the excavated areas and analyzed them with the field test kits, and then ERRS excavated additional soil in the areas that were still contaminated.

By the end of the June 2004 phase of the RA, the excavation of the PCB-contaminated soil in Building 200 was not completed. Contributing factors included the fact that PCB-contaminated soil (as determined by field testing) was still present after initial excavations, and ERRS was provided with fewer than anticipated trucks from the T&D subcontractor. At the direction of the OSC, the excavations were temporarily covered until the RA was completed in October 2004. Before demobilizing from the site at the completion of the June 2004 phase, ERRS secured the Building 200 excavation site by stockpiling PCB-contaminated metal debris and excavated PCB-contaminated soil on the foundation of Building 200. ERRS then covered the stockpile with black polyethylene sheeting, fenced it off with orange construction fencing, and placed PCB warning signs around the perimeter.

In October 2004, EPA returned to the site with ERRS and START-2 to complete the RA. ERRS uncovered the stockpile of PCB-contaminated soil in the foundation of Building 200 and loaded the waste into trucks for T&D. Again, START-2 collected soil samples from the surface of the excavated zone and tested them at the site with field test kits. Based on the field results obtained by START-2, ERRS removed several layers of soil (each approximately 1 to 2 feet deep) in areas of known contamination. Approximately 150 yd^3 of PCB-contaminated soil was removed from below Building 200 (Figure 3-6). At the completion of the excavation, which reached from 2 to 7 feet bgs, START-2 collected 10 final confirmation soil samples and submitted them to a commercial laboratory for PCB analyses. More details regarding these samples are provided in Section 4.3. The results indicated that all samples contained PCBs at concentrations lower than the Oregon PCB Remedy Standard for industrial sites of 7.5 mg/kg

[22] Building 200 (the radome) was built on a foundation of poured concrete footings that were installed on the ground and partly covered with backfill. This backfill material, underneath the building and inside the foundation wall, was contaminated with PCBs.

(see Section 4.3; ODEQ 1997). Following excavation and confirmation sampling, ERRS backfilled the excavated area with site soil from outside the foundation.

3.2.8.2 Buildings 133, 204, and 206

Because of incomplete documentation in USACE records (see Section 2.4), there were questions about possible PCB contamination at other locations, including former PCB transformer pads near Buildings 133, 204, and 206. Therefore, the OSC directed START-2 to investigate these areas.

START-2 collected surface soil samples from around the former transformer pads at Buildings 133, 204, and 206 (see Figure 3-5), and these samples were analyzed for PCBs by field test kits. The results indicated that PCB contamination was present in the surface soil around the transformer pads at Buildings 133 and 206. No PCBs were detected in the samples from Building 204.

Based on these results, ERRS removed the PCB-contaminated soil from the areas indicated on Figures 3-7 and 3-8. At each area of excavation, soil was removed down to approximately 1 foot bgs. Approximately 2 yd^3 were removed from Building 133 and 3 yd^3 were removed from Building 206. After excavation, START-2 collected additional samples, which were submitted to a commercial laboratory for PCB analyses. The results indicated that PCBs were not detected (See Section 4.3).

PCB-contaminated soil from Building 133 and Building 204 was excavated during the June 2004 phase of the RA. The contaminated soil was stockpiled on the former transformer pads at the end of the June 2004 phase, as described above for Building 200. In October 2004, these two stockpiles of PCB-contaminated soil were uncovered and loaded into trucks for off-site T&D along with the PCB-contaminated materials from Building 200.

3.2.9 Steel / Metal Recycling

To reduce transportation and disposal costs, steel and other recyclable metals were separated from other building debris. This was performed while ERRS equipment operators sized and loaded the building debris following demolition. For buildings with predominantly metal exteriors, the exterior walls and roof were pulled away and kept separate from non-metal building materials as much as possible. In other buildings, additional scrap metal was separated from demolition debris during debris sizing and loading.

ERRS contacted several steel recycling companies to remove the on-site scrap steel. Because of the distance to the nearest scrap steel yard, none of the companies would remove the scrap steel and provide EPA a refund without charging transportation costs. ERRS contacted Wurdinger Recycling, Inc., of Mt. Angel, Oregon, who agreed to remove, transport, and recycle the scrap steel (at Schnitzer Steel of Portland, Oregon) at no charge to EPA.

3.2.10 Waste Disposal

The removal activities generated several different waste streams, which were transported off site for disposal. The following waste streams were generated at the site:

1. Friable ACM, 20.5 tons
Generated from the abatement of friable ACM from the buildings, and included pipe insulation, boiler insulation, and steam lines.

2. ACM Debris, 357 tons
Generated from the demolition of site buildings with non-friable ACM such as floor tile and CAB siding. Includes small pieces of ACM debris picked up from ground around building sites.

3. Uncontaminated Demolition Debris (non-ACM), 534 yd^3
Generated from the demolition of buildings, and segregated from ACM debris.

4. PCB Waste, 200 tons
Generated from demolition of Building 200 and excavation of PCB-contaminated soil from Buildings 200, 133, and 206.

5. Scrap Steel, 65 tons
Scrap steel was not considered a waste stream because it was recyclable; scrap steel was taken off site for recycling.

More details about the waste streams and disposal facilities are presented in Table 3-3. Copies of the waste manifests are included in Appendix C.

3.3 CHRONOLOGY OF EVENTS

The following is a list of the significant events that occurred during the RA:

April 20, 2004
ODEQ requested removal support for the site from EPA Region 10 (Monroe 2004).

May 10 - 11, 2004
EPA performed a site walk in preparation of the RA. Participants included OSC Szerlog, David Anderson of ODEQ, and representatives from START-2 and ERRS. During the site walk, START-2 collected samples of suspect building materials for asbestos analysis.
.
May 28, 2004
EPA issued an Action Memorandum for the RA (EPA 2004).

June 10, 2004
The OSC, ERRS (response manager and foreman), and START-2 mobilized to the site. ERRS began to set-up the site for the RA. START-2 and ERRS conducted a site walk with abatement subcontractors (Alpine and Cascade).

June 11, 2004
ERRS continued to mobilize equipment and set-up site for RA. Abatement subcontractor (Alpine) began abatement of friable asbestos in Building 105 and 111. START-2 began daily ambient air monitoring[23] and SHPO photo-documentation

June 12, 2004
The OSC and START-2 surveyed buildings for nesting migratory birds. START-2 finished SHPO photo-documentation. ERRS continued site set-up and marked locations of potential PCB contamination at Buildings 200, 133, 204, and 206.

June 13, 2004
The planned recovery operation of migratory bird nests was canceled[24]. The OSC and START-2 marked the location of friable ACM in site buildings

June 14, 2004
The PST and ERRS workers (equipment operators and laborers) mobilized to the site, and OSC conducted a general site walk and health and safety meeting for the entire crew. ERRS and asbestos workers cleared debris and sagebrush from around Buildings 100 and 105 in preparation of demolition. ERRS demolished Building 100 and began demolition of Building 105. The OSC and START-2 recovered bird nests from Buildings 111, 133, 143, 147, 151, 206, and 207. The OSC transferred them to ODFW personnel, who delivered them to a certified rehabilitator in Pendleton, Oregon. State OSC Mike Renz (ODEQ) arrived to check on the site.

June 15, 2004
ERRS finished demolition of Building 105 and began demolition of Building 111. ERRS also began to load ACM demolition debris for off-site T&D. A NIOSH-certified air analyst from Advantage Environmental, Inc., as a subcontractor to ERRS, began to work on site to analyze ambient and personal air samples[25]. A locator from the power company marked active power line locations. State OSC Renz departed site.

June 16, 2004
ERRS continued to demolish Building 111 and load ACM demolition debris for off-site T&D. Cascade Insulation, the selected abatement subcontractor for the remainder of the RA, mobilized to the site and

---

[23] START-2 continued to perform daily ambient air sampling on every day of demolition or abatement work until July 2, 2004.

[24] The proposed bird rehabilitator in Sisters, Oregon, backed out and declined to accept the recovered birds.

[25] Advantage collected and analyzed personal air monitoring samples from site workers and also analyzed ambient air samples collected by START-2.

abated friable ACM from Buildings 146, 152, 164, and 158. START-2 began to perform additional asbestos surveys of the site buildings.

Frank Messina of the ODEQ Air Quality and Asbestos office in Bend, Oregon, visited the site to observe the RA. PST Certified Industrial Hygienist (CIH) Conrad Philips arrived on site to audit the performance of the PST crew at the removal action. Two local government officials visited the site to meet with the OSC: Steve Grasty, a Harney county judge, and Dan Nicholls, a Harney county commissioner. A reporter from the Burns Times-Herald also visited the site to interview the OSC and to take photographs.

June 17, 2004
ERRS continued loading ACM demolition debris from Building 111 and demolished Buildings 160 and 166. The abatement subcontractor abated friable ACM from Buildings 143, 147, and 151. Dave Anderson, the ODEQ Project Manager, visited the site. The OSC and START-2 surveyed the site buildings again for migratory bird nests; additional nests were discovered in Buildings 158, 147, and 155.

June 18, 2004
ERRS continued to demolish buildings (146 and 152) and to load ACM debris. The abatement subcontractor abated friable ACM from Buildings 143 (boiler room), 130, 133, and 149. The OSC and START-2 performed a second round of bird nest recovery from Buildings 158, 147, and 155.

June 19, 2004
The shears operator began to work on site and began to size metal debris. ERRS continued to demolish buildings (152, 164, and 158) and to load ACM debris. The abatement subcontractor abated friable ACM from Building 165 and set up a negative air enclosure in Building 155 boiler room. START-2 collected soil and wipe samples from Building 200 and performed field testing for PCBs on soil samples.

June 21, 2004
ERRS continued to demolish buildings (143 and 147) and to load ACM debris. The abatement subcontractor performed final cleaning in Building 155 boiler room, removed asbestos-cement panels in Building 149, and began to set up in Building 159. START-2 and Advantage collected clearance samples inside Building 155 boiler room. START-2 continued field testing for PCBs on wipe samples.

June 22, 2004
ERRS continued to demolish buildings (151 and 149) and to load ACM debris. The abatement subcontractor abated Building 159 and prepared for abatement in Buildings 206 and 207. ERRS attempted to decontaminate PCBs from surfaces in Building 200. START-2 collected soil samples for PCBs from Buildings 200, 133, 204, and 206. PST began medical monitoring of personnel in Level C because of high ambient temperatures. A private locator visited the site to survey for underground utility lines in areas of expected excavation around the steam lines and Buildings 200, 149, 165, 204, and 206.

June 23, 2004
ERRS continued to demolish buildings (165, 159, and 130) and to load ACM debris. ERRS also excavated around Tank 804. The abatement subcontractor abated Buildings 206, 207, and Tank 804. ERRS also filled the sump at Building 181 and began demolition of Building 155 and Tank 804. START-2 collected additional wipe samples and tested them for PCBs. PST downgraded the PPE level for picking up non-friable ACM debris to Level D, based on a negative exposure assessment. Dave Anderson of ODEQ visited the site.

June 24, 2004
ERRS continued to demolish buildings (155, 804, 207, and paint shed) and to load ACM debris. The abatement subcontractor abated Building 200 (radome) and began to work on ACM floor tile at Building 111 and 105. ERRS began to demolish Building 200 (radome) and to excavate the steam line across the FAA driveway and behind Building 204. START-2 collected additional wipe samples and tested them for PCBs. BLM personnel visited the site, and OSC showed them ACM steam line from Building 204 that was dumped on BLM property.

June 25, 2004
START-2 collected additional wipe samples inside Building 200 (radome) and performed PCB field testing. ERRS completed demolition of Building 200 (radome) and segregated PCB debris from non-PCB debris. ERRS continued to excavate steam lines and worked with asbestos workers to contain and remove steam lines. During excavation near Building 204, a telephone line was hit; a representative from the telephone company inspected and determined that it was inactive. ERRS also continued to clean building foundations and load demolition debris. START-2 collected final bulk samples for asbestos analysis from Building 204.

June 26, 2004
ERRS continued to load ACM debris and to clean building foundations. ERRS completed excavation and removal of steam line near Building 200 (radome) and FAA facility. ERRS demolished metal portion of Building 133. The abatement subcontractor set up for abatement of Building 204 and removed ACM floor tile from concrete slabs of Buildings 159 and 149. The shears operator demobilized from the site. ERRS and abatement workers placed wrapped and staged steam lines into waste containers.

June 27, 2004
ERRS received four empty 54-yd^3 waste containers for ACM debris, and four full containers were sent off site.

June 28, 2004
ERRS continued to load ACM debris and clean foundations and building sites from demolished buildings. ERRS also began to backfill the steam line trenches. The abatement subcontractor began to abate friable ACM and ACM floor tile from Building 204. ERRS segregated PCB-contaminated steel from debris at Building 200. ERRS excavated PCB-contaminated soil at Buildings 200 (radome), 133, and 206. START-2 collected soil samples from excavated areas at Buildings 200, 133, and 206 and performed PCB field testing.

June 29, 2004
ERRS continued to clean building sites and prepared final ACM debris piles for loading. ERRS began to load non-ACM debris piles into trucks for disposal at local landfill. The abatement subcontractor continued abatement inside Building 204. BLM personnel visited the site to look for additional ACM debris that may have been dumped on their property. They placed ACM that they find near the dumped ACM steam line. The ERRS equipment operator and abatement workers wrapped and removed ACM steam line and debris from former Building 220 (FAA property) and BLM property. Frank Messina from ODEQ visited the site. Site was shut down early (1630 hours) because of lightning and thunder storms

June 30, 2004
ERRS continued to clean building sites and load non-ACM debris. ERRS also excavated additional PCB-contaminated soil from Building 200. The abatement subcontractor finished abatement in Building

204, and START-2 and Advantage performed visual inspection and clearance testing. The abatement subcontractor removed ACM floor tile from Building 133. START-2 performed PCB field testing on soil samples from excavated areas at Buildings 200, 133, and 206. Dave Anderson of ODEQ visited site. Federal OSC Andy Smith arrives on site. Metal recycler (Wurdinger Recycling, Inc.) mobilized to site with trailer-mounted scrap crusher. Site was shut down early (1700 hours) because of lightning and thunder storms.

July 1, 2004

OSC Szerlog demobilized from site, and OSC Smith began to oversee site activities. Advantage analyzed clearance samples from Building 204, which were below clearance limit. Advantage demobilized from site. START-2 collected additional soil samples from Building 200 and shipped samples to commercial laboratory for PCB analysis. ERRS and the abatement subcontractor removed remaining section of ACM steam line (aboveground) at Building 204. ERRS loaded some PCB-contaminated soil and debris from Building 200 into trucks for off-site disposal. Metals scrapper collected and consolidated metal scrap. PST demobilized from site. START-2 began to demobilize from the site.

July 2, 2004

ERRS completed final clearing at building sites and loading of demolition debris. The abatement subcontractor performed a last sweep of building site to pick up loose pieces of ACM debris. ERRS stockpiled and secured PCB soil and debris piles at Buildings 200, 133, and 206. ERRS covered manholes and other physical hazards with slabs of concrete. START-2 collected daily ambient air samples for the last time. OSC and START-2 marked building numbers on foundations with spray paint. OSC Smith, ERRS personnel, and the abatement subcontractor demobilized from the site.

July 3, 2004

START-2 collected photographs and documented final site condition. Metal scrapper worked on site to collect and consolidate metal scrap. START-2 demobilized from site.

July 6 ! 9, 2004

Metal scrapping work was completed and ERRS's rental equipment was demobilized from site.

October 11 - 15, 2004

OSC Szerlog, ERRS, and START-2 mobilized back to the site to complete the RA. ERRS completed excavation of PCB-contaminated soil inside the foundation of Building 200. PCB-contaminated soil and debris were loaded from site (including Buildings 200, 133, and 204) into trucks for off-site T&D. START-2 collected soil samples from the excavation in Building 200, performed PCB field testing, and submitted samples to a commercial laboratory for confirmation analyses. ERRS demolished Buildings 204, 206, and 181[26], filled in sumps at Building 181, and welded a steel plate over the manhole on Tank 800 (ODEQ funded). OSC and START-2 observed that small ACM debris pieces have resurfaced since the June 2004 phase; seven test plots were established to further evaluate the resurfacing issue. ERRS cleaned the building sites of the ACM debris. START-2 collected photographs and documented the final site condition. Dave Anderson of ODEQ visited the site on several occasions throughout the field work.

---

[26] These buildings were not demolished at the completion of the June 2004 phase because of the presence of nesting migratory birds.

Table 3-1

SUMMARY AND DESCRIPTION OF SITE BUILDINGS
BURNS ASBESTOS REMOVAL ACTION SITE
HARNEY COUNTY, OREGON

Building No.	Building Name (1)	Status for Removal Action	Responsibility for Demolition	Building Type	Floor	Building Area (1) (sq. ft.)	Type of ACM	Final Status
NA	Telephone Building	Not Part of RA	NA	Concrete Block	Unknown	Unknown	Unknown	Not Part of RA
100	**Traffic Check House**	**Part of RA**	**EPA**	**Wood Frame**	**Wood / Concrete**	**286**	**CAB siding; 9x9 VAT**	**Building demolished and debris sent off site for disposal.**
105	**BE Maintenance Shop**	**Part of RA**	**EPA**	**Wood Frame**	**Concrete**	**1,800**	**TSI on ducts; CAB siding; 9x9 VAT**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
107	**BE Storage Shed**	**Building was already demolished before RA (debris pile remained)**	**NA**	**N/A**	**Concrete**	**1,152**	**NA**	**Demolition debris sent off-site for disposal.**
108	Fire Hose House	Building was already demolished before RA	NA	N/A	Concrete	48	NA	No Change
109	**Storage, Paint, and Dope**	**Part of RA**	**EPA**	**Metal**	**Concrete**	**80**	**Transite panels inside**	**Building demolished and debris sent off site for disposal.**
111	**Recreation, Multi-Purpose**	**Part of RA**	**EPA**	**Wood Frame**	**Concrete / hardstand**	**5,192**	**TSI on pipes and boiler; CAB siding; 9x9 VAT**	**Asbestos abated, building demolished, and debris sent off-site for disposal.**
120	Fire Hose House	Building was already demolished before RA	NA	NA	NA	48	NA	No Change
128	Auto Storage	Building was already demolished before RA	NA	Concrete Slab	Concrete	3,500	NA	No Change
130	**Auto Maintenance**	**Part of RA**	**ODEQ**	**Metal**	**Concrete**	**2,560**	**Glazing on heater; TSI on pipes and boiler; 9x9 VAT**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
133	**Communication Transmitter / Receiver (2 sections)**	**Part of RA**	**EPA**	**Quonset Hut**	**Concrete**	**960**	**9x9 VAT**	**Asbestos abated; metal structure demolished; waste sent off site for disposal.**
			NA	**Concrete Block**	**Concrete**	**1,100**	**9x9 VAT**	**Asbestos abated; concrete block structure left standing.**
	Total	**NA**	**NA**	**NA**	**NA**	**2,060**	**NA**	**NA**
143	**Dormitory, Airman**	**Part of RA**	**EPA**	**Quonset Hut**	**Wood / concrete**	**3,154**	**TSI on pipes, boiler, and tanks; 9x9 VAT**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
145	Fire Hose House	Building was already demolished before RA	NA	N/A	Concrete	48	NA	No Change
146	**Headquarters, Squadron**	**Part of RA**	**EPA**	**Quonset Hut**	**Wood / concrete**	**1,080**	**TSI on tank; 9x9 VAT**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
147	**Dormitory, Airman**	**Part of RA**	**EPA**	**Quonset Hut**	**Wood / concrete**	**3,154**	**TSI on pipes; 9x9 VAT**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
148	**Warehouse, Supply, and Equipment**	**Building was already demolished before RA (debris pile remained)**	**NA**	**N/A**	**NA**	**192**	**NA**	**Demolition debris sent off-site for disposal.**
149	**Lounge, Dayroom**	**Part of RA**	**EPA**	**Metal (Burned)**	**Concrete**	**2,484**	**TSI on pipes; 9x9 VAT; fire damage**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
151	**Dormitory, Airman**	**Part of RA**	**EPA**	**Quonset Hut**	**Wood / concrete**	**3,266**	**TSI on pipes; 9x9 VAT**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
152	**Officers Quarters**	**Part of RA**	**EPA**	**Quonset Hut**	**Wood / concrete**	**2,100**	**TSI on pipes; 9x9 VAT**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
155	**Dining Hall**	**Part of RA**	**ODEQ**	**Metal**	**Concrete with ceramic tiles**	**3,656**	**TSI on pipes and boiler; 9x9 VAT; loose pieces of CAB on ground**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
158	**Store, Commissary**	**Part of RA**	**EPA**	**Quonset Hut**	**Concrete**	**2,201**	**TSI on tank; 9x9 VAT**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
159	**Open Mess, NCO**	**Part of RA**	**EPA**	**Quonset Hut (Burned)**	**Concrete**	**2,040**	**TSI on pipes; 9x9 VAT; fire damage**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
160	**Radio, Mars**	**Part of RA**	**EPA**	**Wood Frame**	**Wood**	**236**	**CAB siding; Transite ceiling panel**	**Asbestos abated, building demolished, and debris sent off site for disposal.**

Table 3-1

SUMMARY AND DESCRIPTION OF SITE BUILDINGS
BURNS ASBESTOS REMOVAL ACTION SITE
HARNEY COUNTY, OREGON

Building No.	Building Name (1)	Status for Removal Action	Responsibility for Demolition	Building Type	Floor	Building Area (1) (sq. ft.)	Type of ACM	Final Status
162	Fire Hose House	Building was already demolished before RA	NA	NA	NA	48	NA	No Change
164	**Recreation Workshop**	**Part of RA (Building was partly demolished before RA)**	**EPA**	**Concrete Slab - Boiler Room remained**	**Concrete**	**1,080**	**TSI on tank; VAT on concrete slab**	**Asbestos abated (including VAT on slab), building (BR) demolished, and debris sent off site for disposal.**
165	**Water Supply Bldg.**	**Part of RA**	**ODEQ**	**Quonset Hut**	**Concrete**	**462**	**TSI on pipe**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
166	**Special Services**	**Part of RA**	**EPA**	**Wood Frame**	**Concrete**	**240**	**CAB siding**	**Building demolished and debris sent off site for disposal.**
167	Switching Station	Building was already demolished before RA	NA	NA	NA	120	NA	No Change
181	**Waste Treatment Bldg.**	**Part of RA**	**ODEQ**	**Metal**	**Concrete**	**96**	**None**	**Water treatment sumps filled in; Building remains.**
200	**Radome Tower (2 stories, 50' diameter)**	**Part of RA**	**EPA**	**Radome**	**Steel over concrete footings**	**2,000**	**TSI on pipes; TSI and tar paper in steam line; TSI inside vault**	**Asbestos abated, building demolished, and debris sent off site for disposal. PCB-contaminated materials remain.**
204	**AC/ W Operations**	**Part of RA (Building was partly demolished before RA)**	**ODEQ**	**Concrete Block**	**Concrete**	**8,982**	**TSI on pipes and ducts; TSI and tar paper in steam line; TSI on boiler outside; 9x9 VAT; loose pieces of CAB and VAT on ground**	**Asbestos abated (including FT on slab) and debris sent off site for disposal. Existing Concrete block building remained.**
206	**Electric Power Station Bldg.**	**Part of RA**	**ODEQ**	**Concrete Block**	**Concrete**	**1,988**	**TSI on pipes; damaged TSI on ground; 9x9 VAT**	**Asbestos abated and debris sent off site for disposal. Existing concrete block building remained.**
207	**Electric Power Station Bldg.**	**Part of RA**	**EPA**	**Quonset Hut**	**Concrete**	**985**	**TSI on pipes; loose pieces of CAB on ground; 9x9 VAT**	**Asbestos abated, building demolished, and debris sent off site for disposal.**
208	**Storage, Paint, and Dope**	**Building was demolished before RA (demolition pile remained)**	**EPA**	**N/A**	**NA**	**NA**	**Loose pieces of CAB and VAT in demolition pile**	**Demolition debris sent off-site for disposal.**
N/A	**Paint Shed**	**Part of RA**	**ODEQ**	**Concrete Block**	**Concrete**	**96**	**None**	**Building demolished and debris sent off site for disposal.**
210	Covered Walkway	Building was already demolished before RA	NA	NA	NA	NA	NA	No Change
211	**Former Radome Tower**	**Building was already demolished**	**NA**	**Former Radome; only vaults and concrete footings remain**	**Concrete footings**	**2,000**	**TSI and tar paper on steam line in vault**	**Asbestos abated from vault and sent off site for disposal.**
220	**Former Radome Tower**	**Building was already demolished; property is now part of FAA Directional Finder**	**NA**	**Former Radome; only vaults and concrete footings remain**	**Concrete footings**	**2,000**	**TSI and tar paper on steam line on ground**	**Asbestos debris on ground removed and set off site for disposal.**
230	Academic Classroom	Not Part of RA - Part of BPA Facility	NA	Concrete	NA	1,222	NA	No Change
235	Sanitary Latrine	Building Gone (Located on BPA Facility)	NA	N/A	NA	NA	NA	No Change
NA	FAA Facility	Not Part of RA	NA	Concrete	Unknown	Unknown	Unknown	Not Part of RA
800	**Tank**	**Part of RA**	**NA**	**Steel Tank**	**NA**	Unknown	**Unknown**	**Tank manhole was covered with a piece of concrete.**
804	**Tank**	**Part of RA**	**ODEQ**	**Steel Tank**	**Concrete**	Unknown	**Caulk**	**Asbestos abated, tank demolished, and debris sent off site for disposal. PCB-contaminated materials remain.**
830	Water Well	Part of RA	NA	Water Well	NA	NA	Unknown	No Change

Notes: Bold typeface indicates that those buildings were part of the Removal Action.

(1) Names and area estimates from many buildings were obtained from the Focused Feasibility Study (ODEQ 2003).

Key:
ACM = asbestos-containing material
CAB = cement-asbestos board
NA = not applicable or not available
RA = removal action
TSI = thermal system insulation, such as boiler or pipe insulation
VAT = vinyl-asbestos tile

Table 3-2 SUMMARY OF RECOVERED BIRD NESTS BURNS ASBESTOS REMOVAL ACTION HARNEY COUNTY, OREGON		
Date Recovered	**Building Number**	**Description of Recovered Bird Nest**
6/14/2004	111	1 house finch nest with 4 hatchlings
6/14/2004	133	1 robin nest with 3 nestlings
6/14/2004	143	1 house finch nest with 5 eggs
6/14/2004	147	1 house finch nest with 4 eggs
6/14/2004	147	1 house finch nest with 3 nestlings
6/14/2004	151	1 house finch nest with 4 eggs and 1 hatchling
6/14/2004	207	1 robin nest with 3 eggs
6/14/2004	206	1 robin nest with 3 nestlings
6/18/2004	158	1 mountain blue bird nest with 3 to 4 hatchlings
6/18/2004	147	1 mountain blue bird nest with 3 to 4 hatchlings
6/18/2004	155	1 brood of kestrels with 4 nestlings and 1 egg

Table 3-3

SUMMARY OF WASTE STREAM AND DISPOSAL
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Waste Stream	Phase [1]	Total No. of Loads	Total Quantity	Disposal Facility
Friable ACM (pipe insulation, etc.)	June 2004	4	20.5 tons	Finley Butte Landfill Boardman, Oregon
ACM Debris (floor tile and CAB siding)	June 2004	15	349 tons	Columbia Ridge Landfill Arlington, Oregon
	October 2004	1	8 tons	US Ecology Landfill Grand View, Idaho
	Total	17	357 tons	Columbia Ridge / Grand View
Clean Demolition Debris (non-ACM)	June 2004	23	534 yd^3	Harney County Landfill Burns, Oregon
PCB-Contaminated Soil and Metal	June 2004	2	30 tons	US Ecology Landfill Grand View, Idaho
	October 2004	8	170 tons	US Ecology Landfill Grand View, Idaho
	Total	10	200 tons	US Ecology Landfill Grand View, Idaho
Scrap Steel	June 2004	Unknown	65 tons	Schnitzer Steel Portland, Oregon

Notes: (1) The June 2004 phase was performed from June 10 through July 3, 2004, with steel scrap recovery continuing until July 9, 2004. The October 2004 phase was performed from October 11 through 15, 2004.

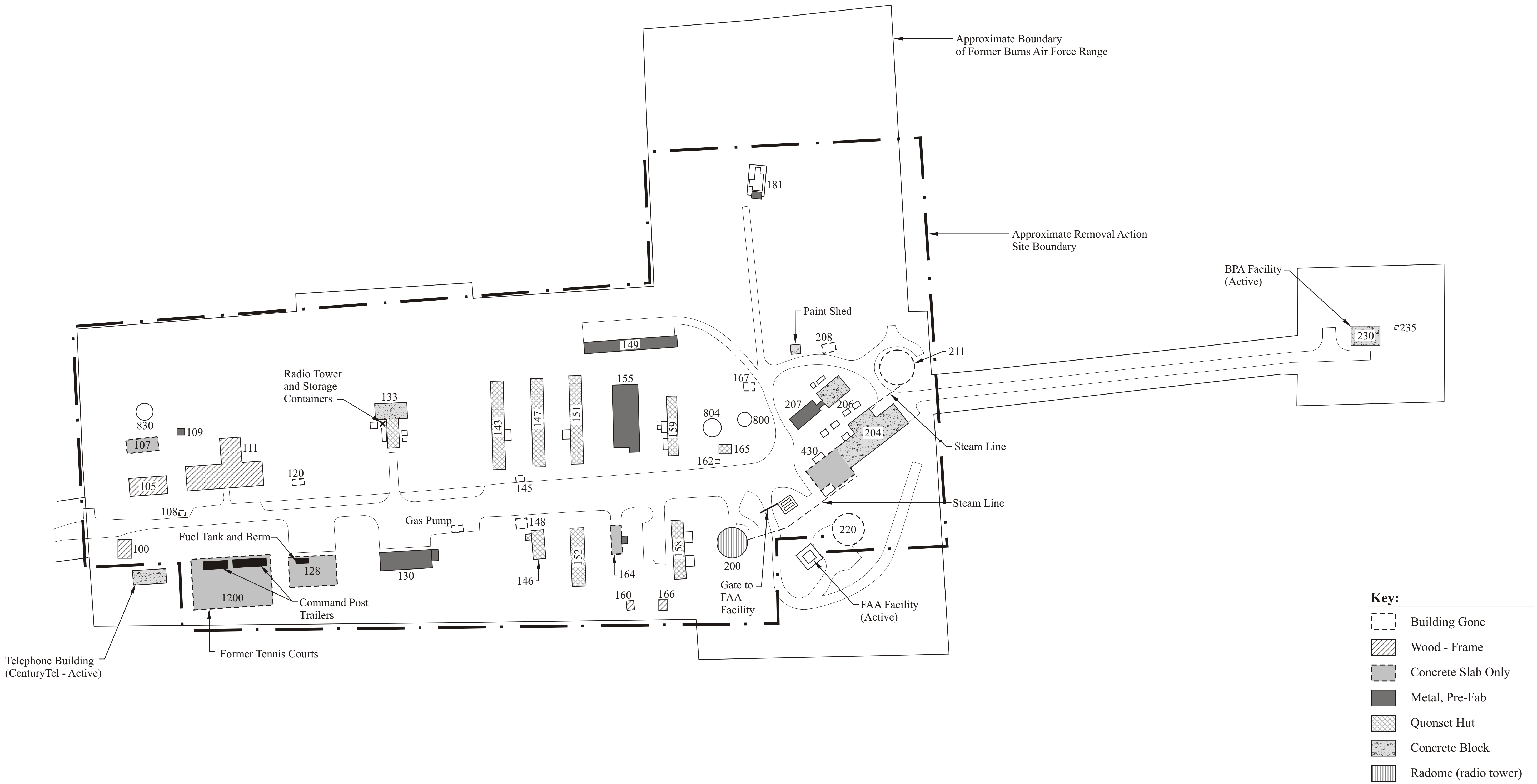
Key:

ACM = asbestos-containing material

CAB = cement-asbestos board

N/A = not applicable

yd^3 = cubic yard

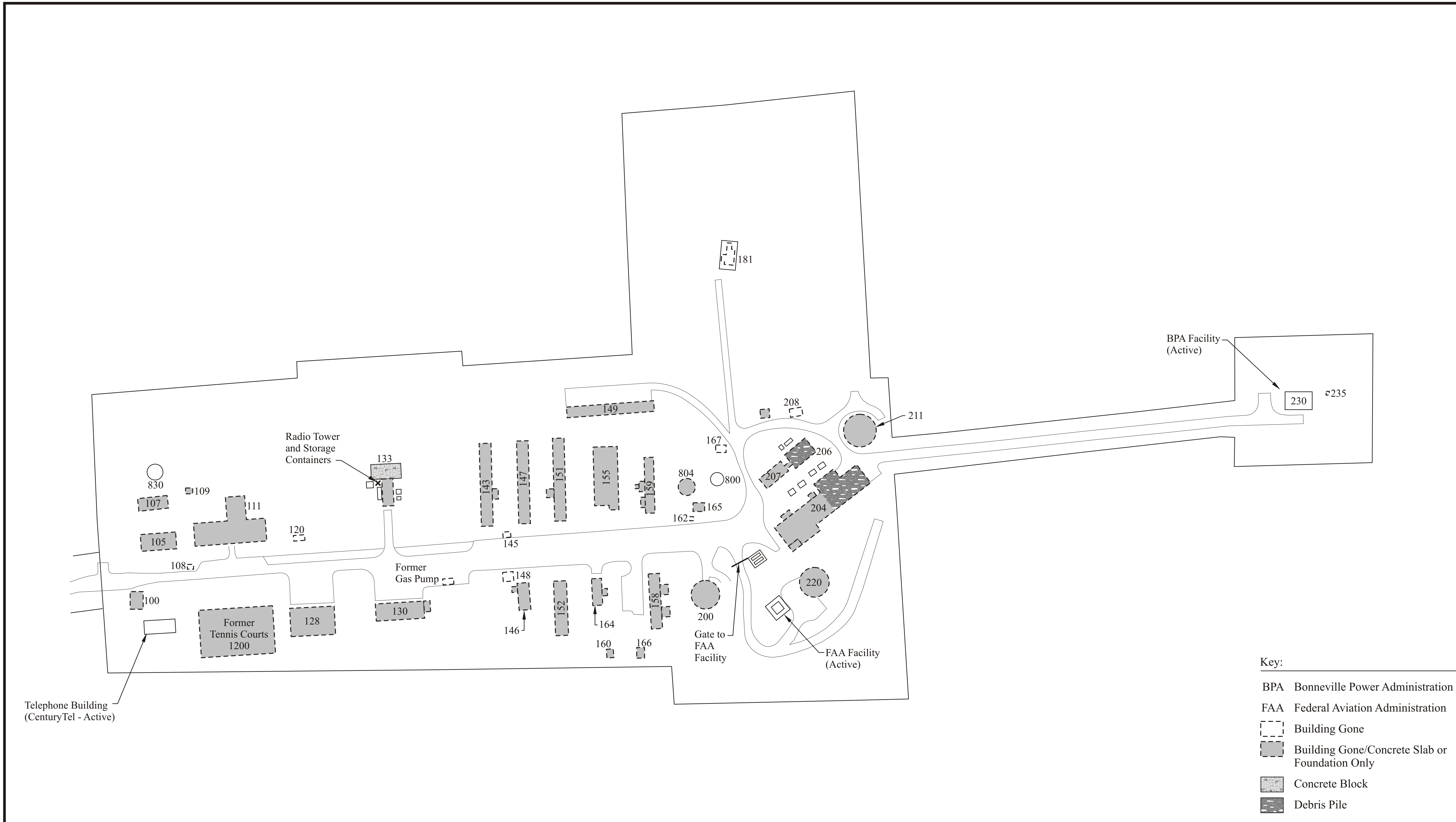


ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

Figure 3-1
REMOVAL ACTION REPORT
SITE LAYOUT AND BUILDING TYPE CATEGORIES

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\fig 3-1



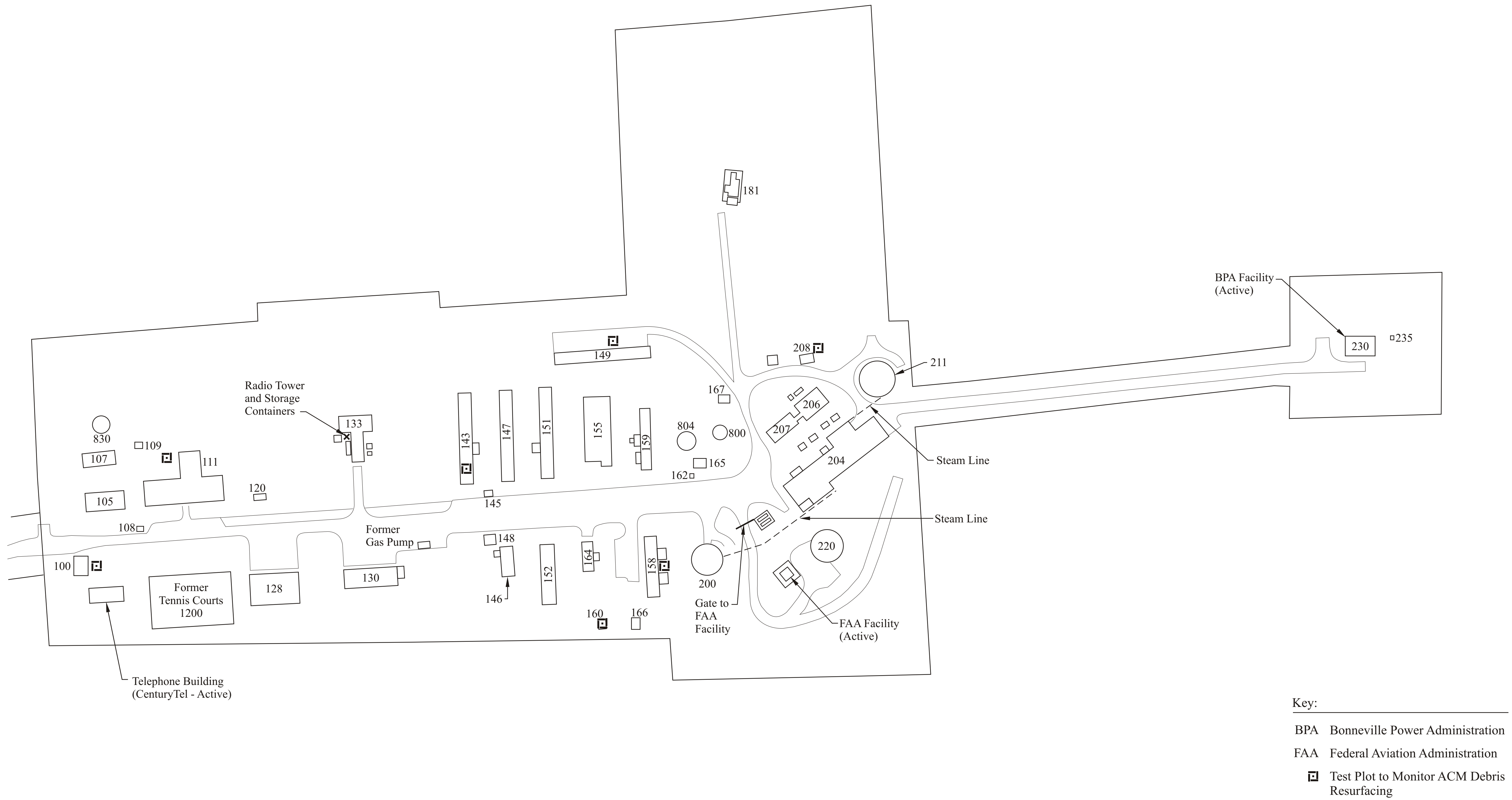
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

0 100 200
Approximate Scale in Feet

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

Figure 3-2
REMOVAL ACTION REPORT
SITE LAYOUT AFTER REMOVAL ACTION

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\fig 3-2



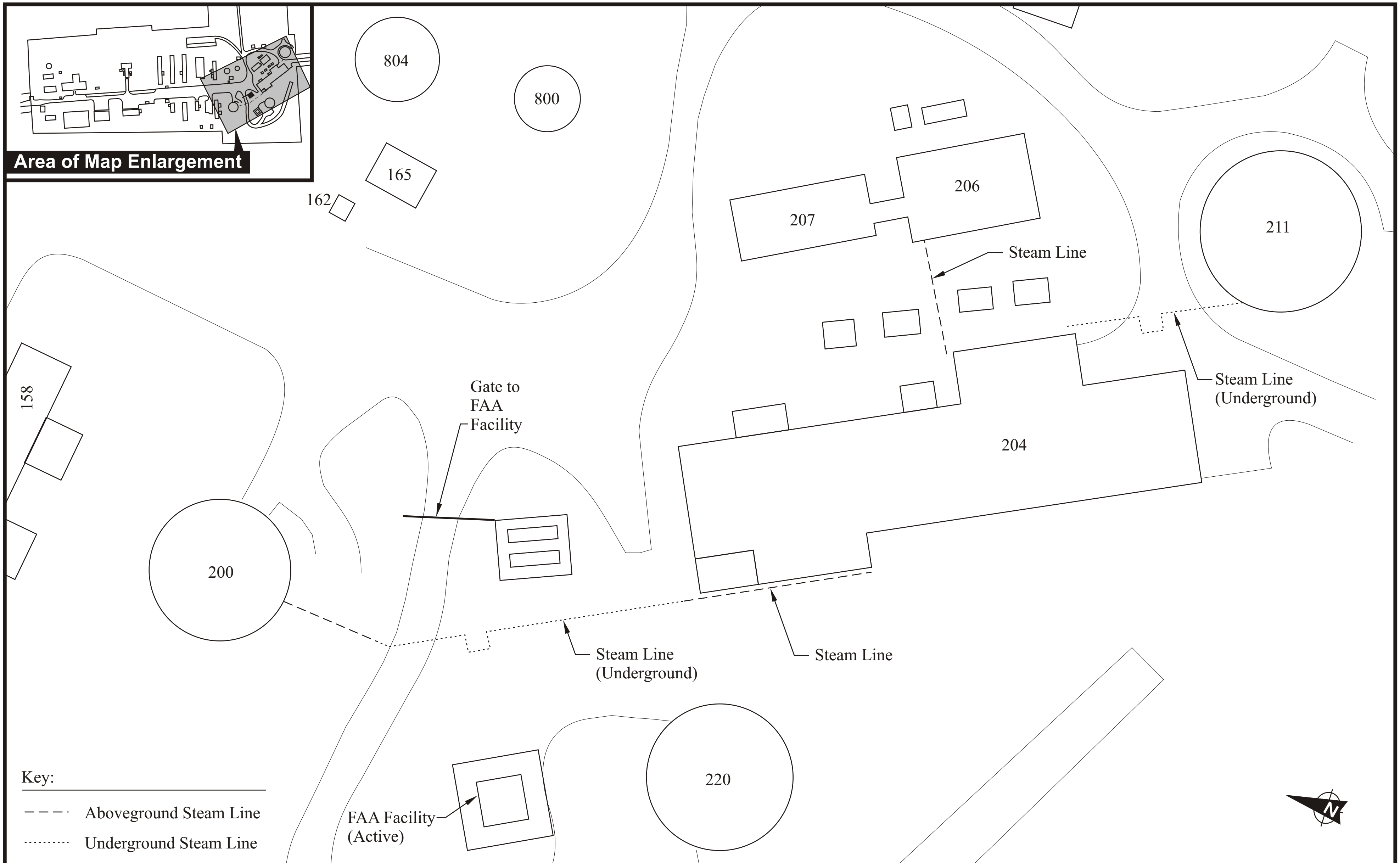
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

0 100 200
Approximate Scale in Feet

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

Figure 3-3
REMOVAL ACTION REPORT
LOCATION OF SURFACE ACM DEBRIS TEST PLOTS

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\fig 3-3



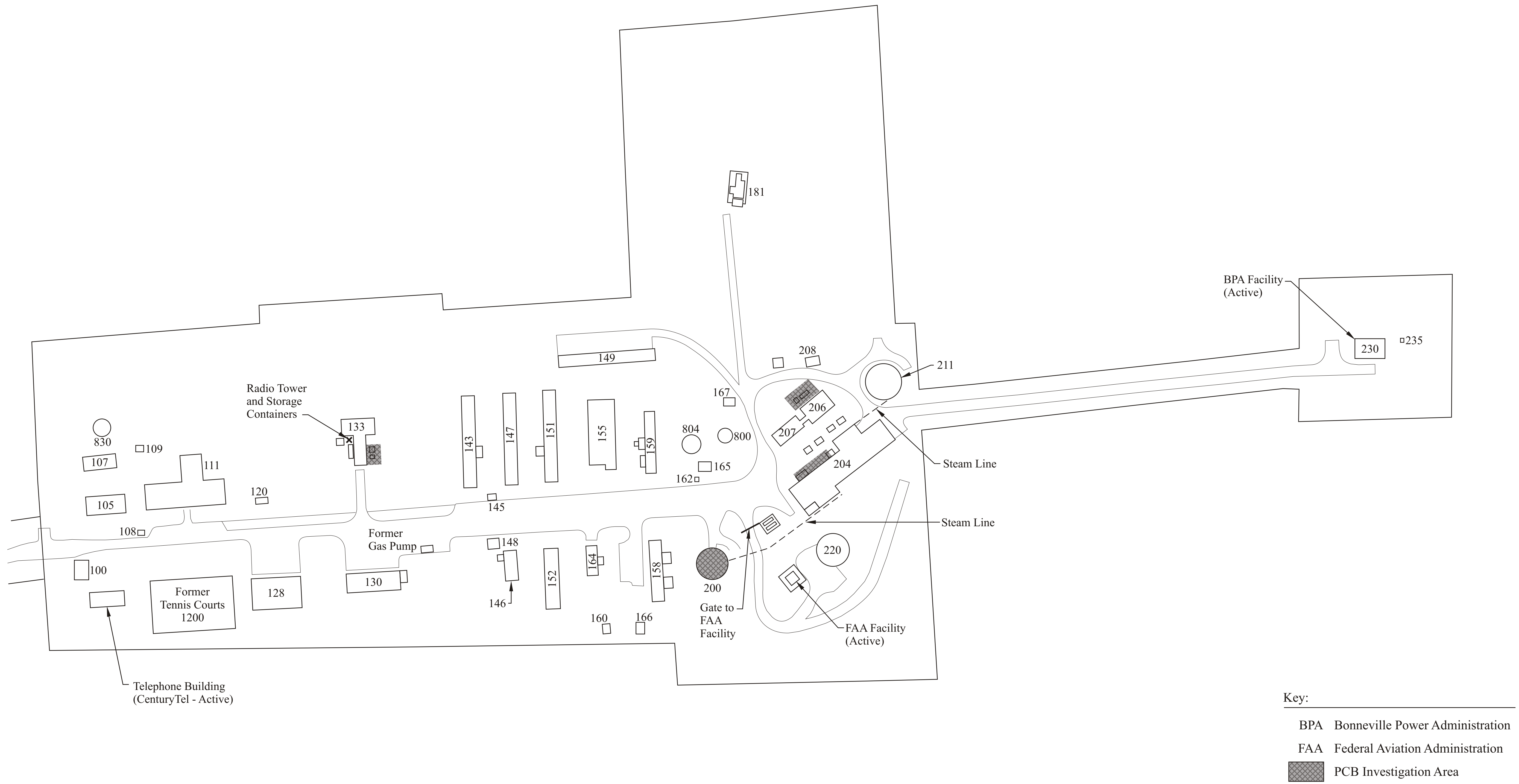
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 50 100
Approximate Scale in Feet

Figure 3-4
REMOVAL ACTION REPORT
ACM STEAM LINES

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\fig 3-4



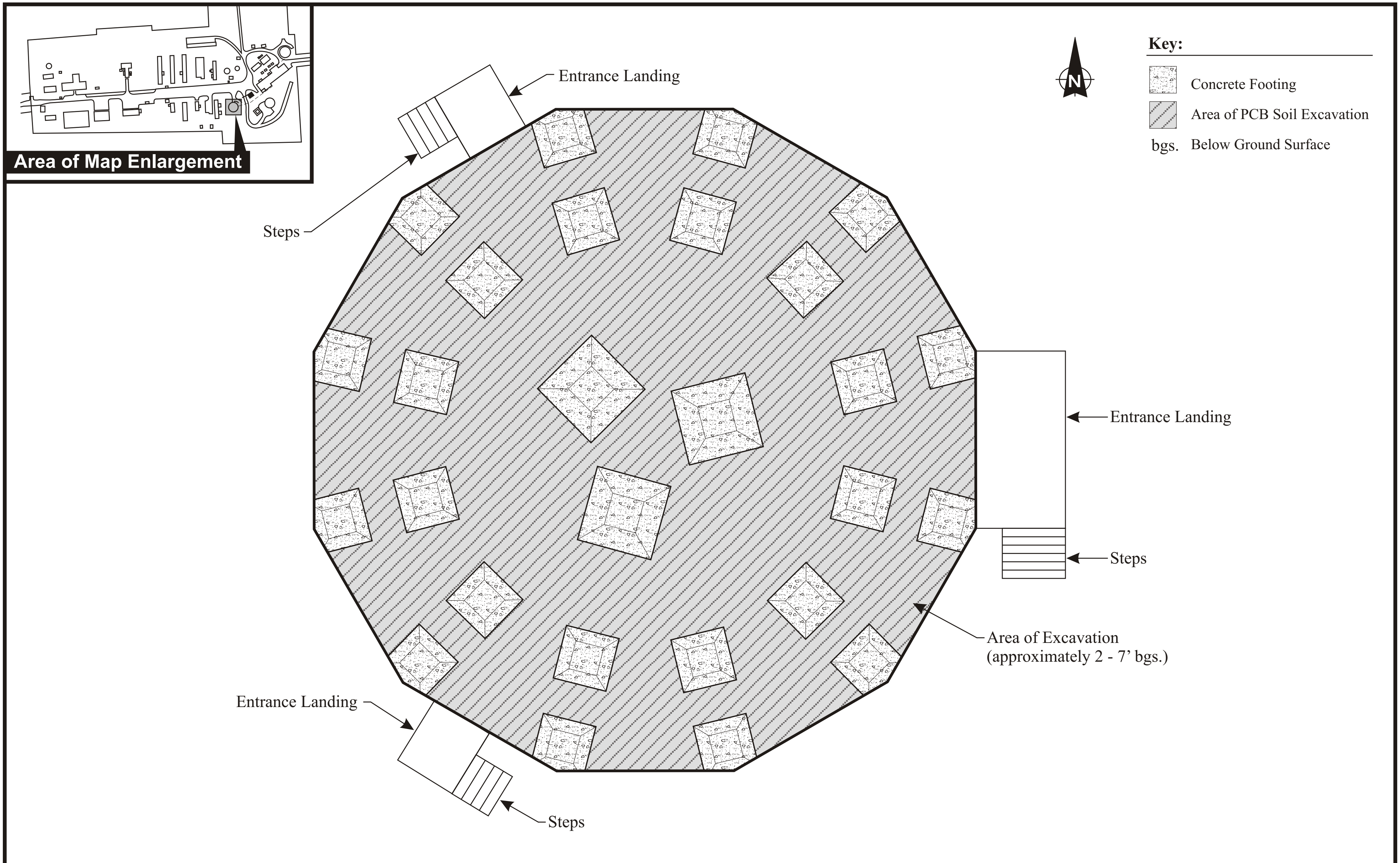
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

Figure 3-5

REMOVAL ACTION REPORT
AREAS OF PCB INVESTIGATION

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\fig 3-5



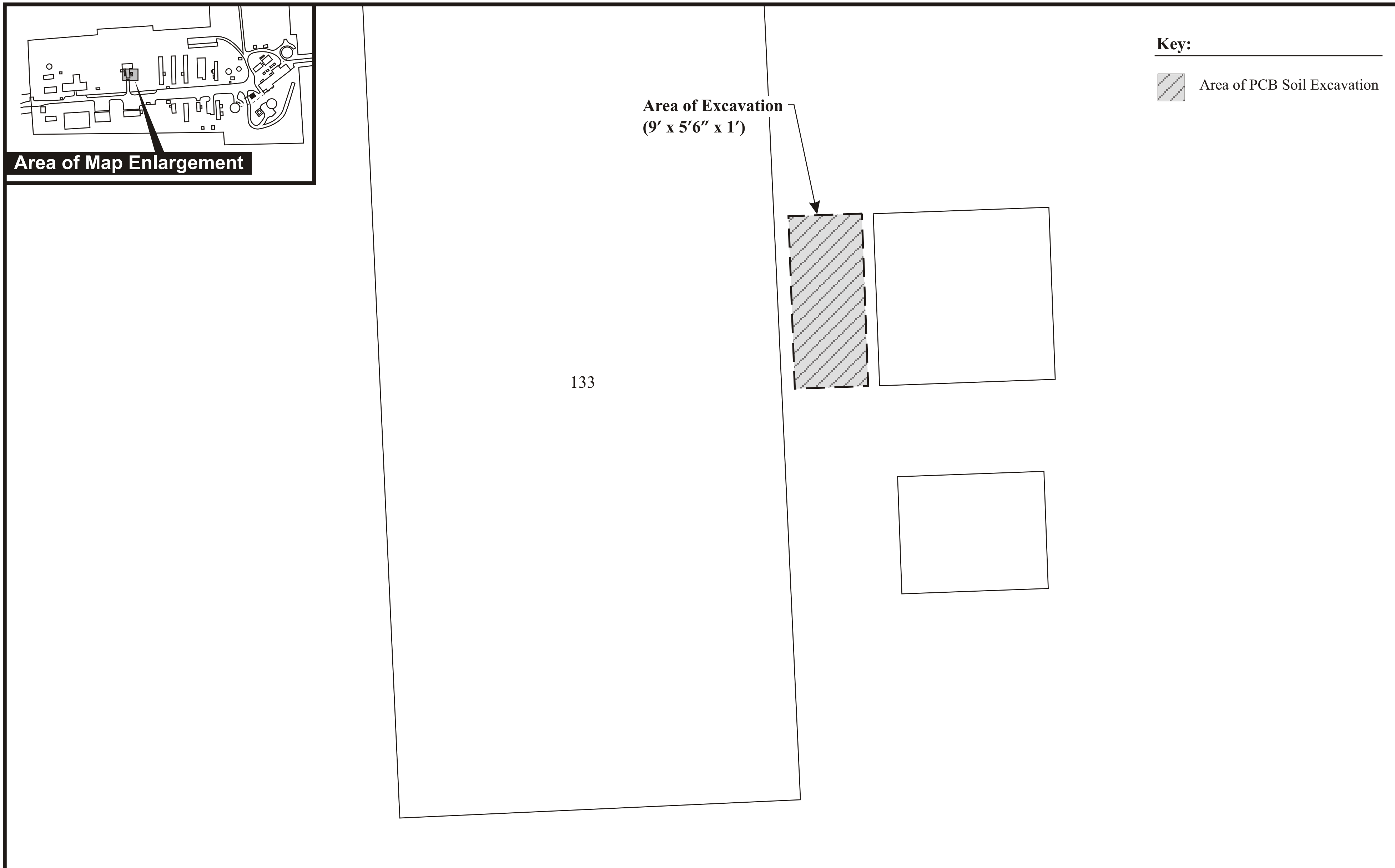
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 5 10
Approximate Scale in Feet

Figure 3-6
BUILDING 200 (RADOME)
PCB EXCAVATION AREA

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\fig 3-6



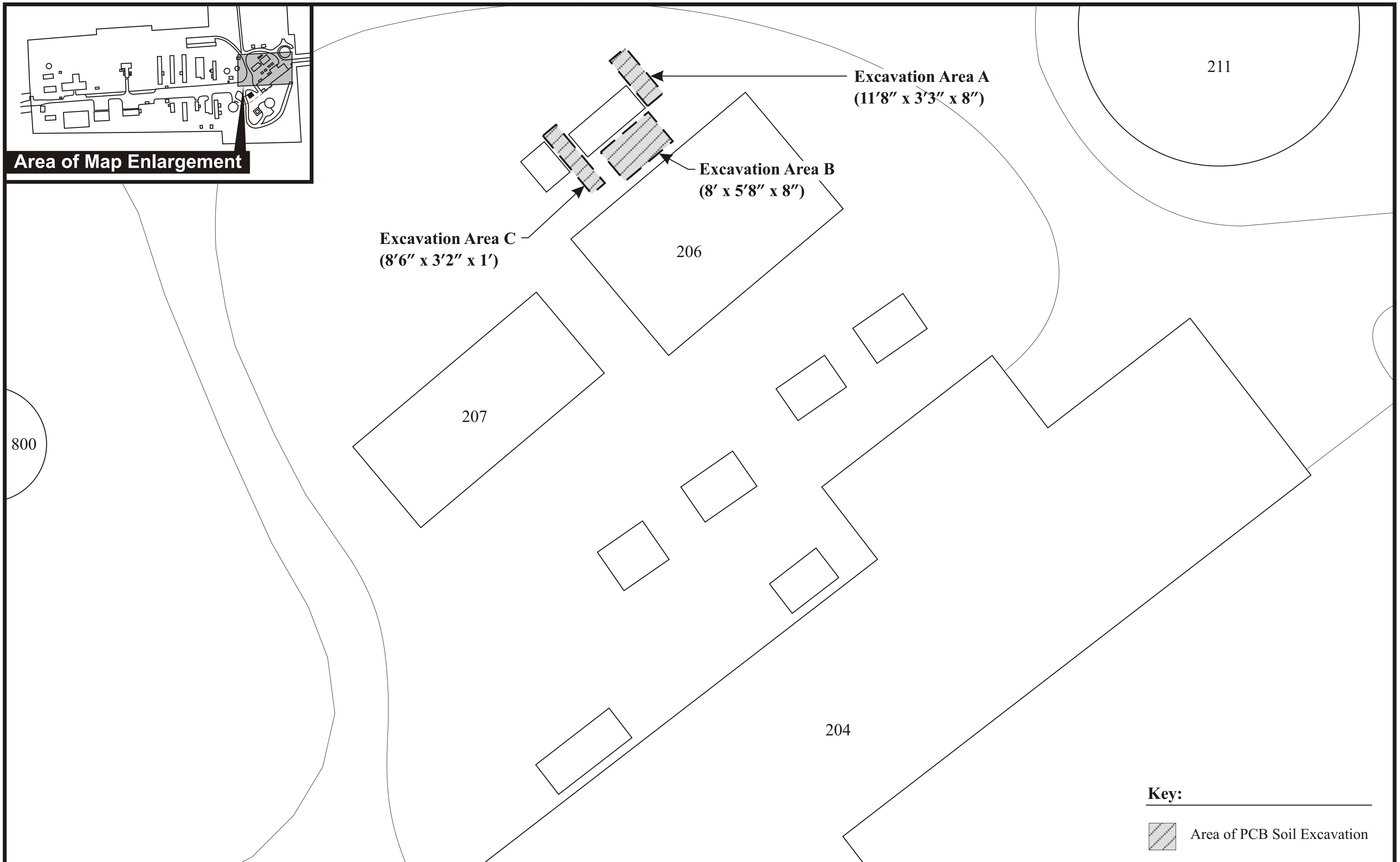
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 5 10
Approximate Scale in Feet

Figure 3-7
BUILDING 133
PCB EXCAVATION AREA

Date: 12/29/04
Drawn by: AES
10:START-2\04060001\fig 3-7



ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 10 20
Approximate Scale in Feet

Figure 3-8
BUILDING 206
PCB EXCAVATION AREA

Date: 12/29/04

Drawn by: AES

10:START-2\04060001\fig 3-8

4. SAMPLE COLLECTION AND ANALYSIS

Throughout the RA, START-2 collected numerous samples of several different matrices, including air, soil, wipe, and bulk building materials. The samples were collected and analyzed to characterize and document site conditions before, during, and after the RA. A brief summary of the samples and matrices is provided below, with additional details presented in the remainder of this section.

- Bulk samples were analyzed for asbestos by PLM at a state and commercial laboratory.
- Air samples were analyzed for asbestos fibers by PCM in the field and by PCM and transmission electron microscopy (TEM) at a commercial laboratory.
- Soil and wipe samples were analyzed for PCBs in the field with immunoassay test kits.
- Soil samples were analyzed for PCBs by gas chromatograph (GC) at a commercial laboratory.

4.1 BULK SAMPLES FOR ASBESTOS ANALYSES

ODEQ and START-2 performed several rounds of asbestos surveys and sampling at the site. ODEQ surveyed the site and collected bulk samples for asbestos analyses during their site investigations in 2002 and 2003 (ODEQ 2002a, ODEQ 2002b, ODEQ 2003b, ODEQ 2003c). START-2 collected bulk samples during the EPA site walk in May 2004 and also during the RA in June 2004[27]. During the surveys, bulk samples were collected from suspect building materials to determine whether they contained asbestos. Bulk samples were analyzed for asbestos by PLM in accordance with EPA Method 600/R-93/116. Data reports for START-2 samples are included in Appendix D.

The ODEQ samples were analyzed by the ODEQ laboratory in Portland, Oregon, and ODEQ provided copies of the results to EPA and START-2 to assist with the planning of the RA. The ODEQ laboratory also analyzed the bulk samples collected by START-2 during EPA's site walk in May 2004. There were a total of 27 bulk samples collected before the RA, including 18 collected by ODEQ and nine collected by START-2. These samples and the PLM results are summarized in Table 4-1. The results

[27] The START-2 bulk samples were collected by an Asbestos Hazard Emergency Response Act (AHERA)-certified building inspector.

indicate that several broad types of suspect building materials contained 1% asbestos or greater and thus were ACM. These materials included VAT (ACM floor tile), pipe and duct insulation, and CAB siding.

During the EPA site walk, START-2 observed the types of ACM documented by ODEQ (floor tile, pipe insulation, and CAB siding). For sampling, START-2 addressed other suspect materials that were present in most of the site buildings, including dry wall, plaster, and wiring. These materials were considered to be important for the planning phases of the RA because they were found in most of the buildings, and the determination of whether they were ACM or not had a potentially large impact on the cost and schedule of the RA. START-2 collected nine bulk samples from these suspect materials and submitted them to the ODEQ laboratory for PLM analyses. The PLM results for these samples (included in Table 4-1) indicated that no asbestos was detected in these samples.

During the RA, START-2 collected additional bulk samples of suspect materials to determine the asbestos content of specific suspect materials that were observed while performing detailed surveys of each site building. These suspect materials included loose fill insulation and paints on certain boilers, window glazing, tar paper layers in pipe insulation, caulk applied at the base of Tank 804, and boiler gaskets. START-2 collected a total of 37 bulk samples during the RA (BM-01 through BM-37), and the samples were submitted for quick turnaround PLM analyses to Environmental Hazard Services, LLC, of Richmond, Virginia, as a subcontractor to ERRS. Table 4-2 summarizes these samples and the PLM results. These results were used in the field to determine whether suspect materials required disposal as ACM. The results indicated that many of the suspect materials were not ACM, but some materials, including a boiler gasket, a glazing material on a blower, tar paper used to wrap ACM insulation, and boiler insulation, were ACM. Of particular interest, note that the insulation inside the steam line, which had not been previously tested, was found to have contained 60% to 80% amosite, a particularly friable form of asbestos.

4.2 AMBIENT AIR SAMPLES

As directed by the OSC, START-2 collected daily ambient air samples around the site to document the concentration of airborne asbestos fibers being released as a result of site activities. Ambient air sampling began on June 11 and continued on a daily[28] basis until July 2. A total of 87 ambient air samples were collected and analyzed for PCM and/or TEM analyses (as described in detail

---

[28] START-2 collected ambient air samples on every day from June 11 through July 2 that abatement, demolition, or loading work was performed. Ambient air sampling was not performed on June 13, 20, or 27, which were scheduled as days off from heavy site work.

below). The results indicated that only one[29] sample exceeded applicable benchmarks, indicating that the RA activities were conducted in a manner that was safe, effective, and protective of human health and the environment.

Ambient air sampling and analysis was performed in accordance with NIOSH Method 7400 with Gast high volume rotary vane air sampling pumps and 0.8 micrometer (µm) mixed cellulose ester (MCE) filter cassettes. The air samples were generally collected for 4 to 10 hours at typical flow rates of 5 to 10 liters per minute (L/min), for typical air volumes ranging from 1,000 to 6,000 liters per sample. During sampling, the filter cassettes were suspended at a height of approximately 3 to 5 feet from the ground.

START-2 typically set up three to five air pumps each day in varied locations depending on daily activities and weather conditions (primarily wind direction and speed). The PST operated a weather monitoring station at the site, which START-2 used to help locate the air sampling pumps. Data log sheets from the PST weather station are included in Appendix E. In general, START-2 collected one upwind sample as a background and several downwind samples for the day's activities. For example, when Building 111 was demolished, the wind was generally from the west. Therefore, one air sampling pump was placed to the west (upwind), and two were placed to the east (downwind).

In the early part of the RA, winds tended to blow from the west, and typical air pump locations were as described above. However, towards the end of the RA, wind direction become more unpredictable, with wind directions changing frequently. Overall, sustained wind directions were typically from either the west or east, although they shifted frequently. By this time, ambient air sample data indicated that the background concentration of asbestos fibers was less than the limit of detection (LOD) and that asbestos fibers were not being released at significant levels from site activities. Therefore, START-2 began to place air pumps on either side (west and east) of the activity zone, without specifically intending them to be exclusively upwind or downwind. The expectation was that any airborne asbestos fiber from a site activity would be caught by either air pump, depending on the wind direction at that time.

START-2 recorded the locations of the air pumps in relation to the daily activity zones for each day of the RA. These locations are indicated in Figures 4-1 through 4-19.

---

[29] The one exceedance of the AHERA clearance limit was the off-site PCM analysis of sample 0629-A. A duplicate analysis of this sample performed by the on-site PCM analyst was less than detectable limits. Additionally, two estimated TEM results (samples 0701-B and 0702-C) also exceeded the clearance limit. However, these samples were overloaded with dust, analyzed by an indirect TEM method, and were considered as estimated values.

The samples were analyzed in the field for asbestos and other fibers by PCM by an on-site NIOSH-certified air analyst (Dale Voeller of Advantage Environmental, Inc., as a subcontractor to ERRS). The results were typically obtained by the next day and were reviewed to evaluate engineering and dust control methods being used during abatement, demolition, and loading activities.

In addition to the field analyzes, a certain percentage of the filter cassettes were submitted to an independent[30] laboratory to confirm the on-site results. The samples were analyzed by EMSL Analytical, Inc. (EMSL) of Westmont, New Jersey, as a subcontractor to ERRS. Approximately 10% of the PCM cassettes analyzed by the on-site analyst were submitted for PCM analyses at PCM.

Some air samples were also submitted for TEM analyses. TEM analysis is a much more sensitive and accurate method for the analysis of asbestos fibers than PCM, but it does have some drawbacks such as increased analytical costs and turn around times. PCM analyses offers the benefits of field portability and very quick turn around times. However, PCM is not as accurate as TEM; in fact, the PCM method does not distinguish between asbestos fibers and non-asbestos fibers. With PCM, any fiber detected is assumed to be an asbestos fiber. Therefore, the OSC directed START-2 to collect TEM samples, in addition to the PCM samples, to provide rigorous confirmation of the PCM results.

The TEM samples were collected in accordance with NIOSH method 7402. The sample collection method is similar to the PCM sampling method, with the exception that a 0.45 μm MCE filter cassette was used. START-2 generally collected one TEM sample of each day of air monitoring, beginning on June 15. Many of the TEM samples were co-located with PCM samples. The TEM samples were also analyzed by EMSL, in accordance with a modified EPA Level II method. The TEM method was modified to include the AHERA sensitivity of 0.005 structures per cubic centimeter of air (s/cc) and a minimum fiber length of 0.5 μm.

Table 4-3 presents the results or the ambient air analyses, including on-site PCM analyses and the PCM and TEM analyses performed at the laboratory. PCM and TEM results are also included on Figures 4-1 through 4-19. Analytical reports are included in Appendix F.

START-2 compared the results to two applicable standards. The OSHA permissible exposure limit (PEL) for asbestos fibers is 0.1 f/cc (NIOSH 2004). The AHERA clearance limit for abatement projects is 0.01 f/cc (40 CFR Part 763). The results of the on-site PCM analyses indicated that none of the samples exceeded the clearance limit of 0.01 f/cc. Most of the on-site PCM results were reported by the on-site analyst as less than the limit of detection (< LOD). The actual LOD for each sample varies

[30] Independent of Advantage, the on-site PCM analyst.

based on the volume of air collected. Based on sample volumes and fiber counts for other site samples, the typical LOD was no greater than 0.001 f/cc, which is one-tenth the AHERA clearance limit of 0.01 f/cc. The highest result obtained by the on-site PCM analyst was 0.0053 f/cc (sample 0616-D), which is approximately one-half the clearance limit of 0.01 f/cc. Two of the samples could not be analyzed by the on-site PCM analyst: one because the filter cassette was assembled backwards (sample 0612-A), and one because the sample was overloaded with dust (sample 0614-B).

The results of the off-site PCM and TEM analyses are also included in Table 4-3. For the off-site PCM analyses, some of the samples were submitted to an off-site laboratory only because the on-site PCM analyst had already demobilized from the site. The results for these samples (0701-A, 0701-C, 0702-A, and 0702-B) were all less than the clearance limit of 0.01 f/cc. The remaining off-site PCM samples were submitted as duplicates of the on-site PCM analyses. Additionally, field blanks were submitted to the off-site laboratory. In general, the off-site PCM result was similar to the on-site PCM result. For example, the results for sample 0614-C were 0.0012 f/cc by on-site PCM and 0.001 f/cc by off-site PCM. The results for sample 0617-C were 0.0023 f/cc by on-site PCM and 0.003 f/cc by off-site PCM. One off-site PCM result was noticeably different than the on-site PCM. For sample 0629-A, the off-site PCM result was 0.011 f/cc, while the on-site PCM result was < LOD. This sample was the only PCM sample that exceeded the clearance limit of 0.01 f/cc.

The TEM results in Table 4-3 were also generally low. Most of the results were less than detectable limits, with the highest direct TEM result being 0.0095 s/cc (sample 0628-B). Two of the TEM samples (0701-B and 0702-C) were overloaded with dust and could not be analyzed by the direct TEM method. Therefore, the samples were analyzed by the indirect transfer method as described in International Standards Organization (ISO) Method 13794 sections 8.3 and 8.5. The indirect transfer method involves extracting the entire filter in a liquid and then redepositing it on a new filter for analysis. Because this method is so disruptive, the results are considered as estimated values. The TEM result by indirect transfer method was 0.0160 s/cc for sample 0701-B and less than 0.0729 s/cc for 0702-C.

Table 4-3 also includes the results of clearance testing, in addition to ambient air monitoring. In general, clearance testing was performed in areas that had been abated with negative pressure enclosures with HEPA filters on the exhaust and that were not immediately demolished following abatement. This occurred twice, in the Building 144 boiler room (0621-D and CL-36) and inside Building 204 (samples 0630-E, 0630-F, CL-88, and CL-89). Clearance testing was performed by both START-2 and Advantage (the on-site PCM analyst) with the same method used for ambient air sampling. The PCM results for all clearance samples were less than the clearance limit of 0.01 f/cc.

4.3 PCB SAMPLING AND RESULTS

During the RA, START-2 collected soil and wipe samples for PCB analyses. PCB analyses were performed by START-2 in the field with field test kits and at a commercial analytical laboratory.

4.3.1 PCB Soil Samples

START-2 collected a total of 67 soil samples for PCB analysis from the site. The samples were collected from the areas of known or suspected PCB contamination near or inside Buildings 200, 133, 204, and 206 (see Section 3.2.8). Additionally, one background sample (SS-06) was collected near the command post. Samples were collected from surface soil (either at the original grade or at the bottom of an excavated area) in accordance with the site-specific sampling plan (SSSP; E & E 2004). All soil samples were collected with dedicated sampling equipment (pre-cleaned, stainless steel spoons) into pre-cleaned, certified sample jars. START-2 samplers changed gloves between each sample to prevent cross contamination. Soil samples were stored on ice at 4 degrees Celsius (°C).

The soil samples were analyzed for PCBs by field test kits and a commercial analytical laboratory. START-2 performed field testing with an Ensys™ immunoassay test kit with an Aroclor 1260 standard at detection limits of 1 and 10 ppm in accordance with the manufacturer's instructions and SW-846 Method 4020. Site soil samples were also submitted for PCB analyses in accordance with SW-846 Method 8082 at STL-Seattle of Tacoma, Washington, under subcontract to ERRS. Of the 67 soil samples collected, START-2 analyzed 60[31] in the field with the Ensys field test kit. Of these 60 samples, 19 were also submitted to the commercial laboratory to confirm the Ensys results. Additionally, five soil samples were submitted directly to the laboratory, without on-site Ensys testing. Two of the soil samples were not analyzed by either Ensys or the analytical laboratory[32].

Table 4-4 presents the PCB results for all soil samples, including Ensys field test kit results and a summary of the analytical lab results. Table 4-4 also compares the results of the Ensys field tests to the analytical lab results for those 19 samples that were analyzed by both methods. Table 4-5 provides a

[31] One of the samples tested with the Ensys field test kit was a composite representing two samples (SS-07 and SS-08).

[32] These two samples were not analyzed because nearby samples SS-38 and SS-40 were analyzed.

detailed summary of the analytical laboratory results. Data reports from the off-site analytical laboratory are presented in Appendix G.

A comparison of the results indicated that most of the Ensys field results agreed with the analytical laboratory results, although there were some discrepancies. Of the 25 possible comparisons, 19 of the laboratory results were exactly as predicted by the Ensys field test results. Two of the discrepancies involved results where both the Ensys and laboratory results indicated the presence of PCBs, but the predicted concentration did not exactly match (Samples SS-43 and SS-48). Four of the discrepancies involved false positives, where the Ensys field test indicated a positive result at 1 ppm, while the analytical result indicated that PCBs were not detected (Samples SS-31, SS-36, SS-38, and SS-42). The specific cause for the false positives is not known, but these four samples were all analyzed in the same batch, indicating there may have been a problem with the testing during that particular batch. The results also indicated positive detections of PCBs at 1 ppm for most of the other samples in that batch as well, indicating they may also have been false positives. The samples analyzed in this suspect batch are indicated on Table 4-4. Overall, the Ensys field test kit correctly predicted analytical results 76% of the time (19 of 25) for all samples and 90% of the time (19 of 21) if the suspected bad batch is excluded. Based on these accuracy rates, the Ensys field test kit was found to be a useful and cost-effective field screening tool for the RA.

START-2 performed the first round of Ensys field testing on surface soil samples from the suspected PCB areas at Buildings 200, 133, 204, and 206. The results indicated that PCB-contaminated soil (greater than 1 ppm) was present at Buildings 200, 133, and 206. All soil samples from Building 204 were negative at the 1 ppm detection limit.

Based on these results, the OSC directed ERRS to excavate the PCB-contaminated soil from Buildings 200, 133, and 206 (see Section 3.2.8 for more details). Following excavation, START-2 collected additional samples from the bottom of the excavated area and submitted these samples for additional PCB testing, either in the field or at the off-site analytical laboratory. These steps were repeated as necessary to remove PCB-contaminated soil.

For Building 200, several rounds of excavation, sampling, and PCB testing were performed to remove PCB-contaminated soil. Field testing indicated that PCB-contaminated soil (greater than 1 ppm) was present inside the radome foundation through the initial round of sampling (samples SS-01 through SS-05) and after the first excavation (samples SS-43 through SS-48; approximately 1 to 2 feet bgs). Analytical laboratory results for these samples included 8.1 mg/kg (SS-01), 1.72 mg/kg (SS-05), 8.85 J mg/kg (SS-43), and 0.384 mg/kg (SS-48). The second excavation was performed at the end of the June

2004 phase, and the soil samples collected by START-2 were sent directly to the analytical laboratory. These samples (SS-49 through SS-52, approximately 2 to 4 feet bgs) had Aroclor 1254 concentrations ranging from 0.159 mg/kg (SS-51) to 145 mg/kg (SS-50).

During the October 2004 phase of the RA, ERRS performed a third excavation inside Building 200. The samples collected by START-2 from the bottom of this excavation (SS-53 through SS-56; approximately 4 to 6 feet bgs) were all greater than 1 ppm with the Ensys field test kit, and one was greater than 10 ppm (SS-55). ERRS then performed a fourth excavation in the centrally-contaminated area (approximately 6 to 7 feet bgs). Following this last excavation, START-2 collected 10 samples from the entire foundation area, as final confirmation samples (SS-57 through SS-66; approximately 2 to 7 feet bgs). START-2 tested these samples with the Ensys field test kit at the 10 ppm detection limit. All of the samples were less than 10 ppm, except SS-63. ERRS excavated an additional one foot of material at the location of SS-63, and START-2 collected a final sample (SS-67). START-2 submitted the final 10 samples (SS-57 through SS-62 and SS-64 through SS-67) to the off-site analytical laboratory. The results indicate that Aroclor 1254 was detected in all 10 samples, with concentrations ranging from 0.0672 J mg/kg (SS-67) to 2.94 mg/kg (SS-66).

The final 10 samples submitted to the off-site laboratory (SS-57 through SS-62 and SS-64 through SS-67) represent the final condition of the soil inside Building 200, prior to backfill. The locations of these 10 samples, along with the concentration of Aroclor 1254 and the approximate depth from the original grade, are illustrated on Figure 4-20. The results indicate all 10 samples are less than the Oregon industrial standard of 7.5 mg/kg, although four do exceed the Oregon residential standard of 1.2 mg/kg (ODEQ 1997).

At the PCB-contaminated area of Buildings 133 and 206, only one round of excavation and confirmation sampling was necessary. At Building 133, one of the initial surface soil samples (SS-11) was positive (greater than 1 ppm). ERRS excavated soil at this location for off-site disposal, and START-2 collected confirmation samples (SS-31 through SS-34). The Ensys results for these samples indicated that some were still positive for PCBs at 1 ppm. One of these samples (SS-31) was submitted to the off-site laboratory, and the result indicated that PCBs were not detected[33]. Based on the laboratory results, the removal of PCB-contaminated soil was considered to be completed at Building 133. Figure 4-21 presents the final soil samples and results at Building 133.

---

[33] This sample is one of the false positives as described previously. In the case of discrepancies between Ensys and analytical laboratory results, the laboratory results were used.

For Building 206, initial soil samples (SS-25 through SS-30) indicated that some were positive for PCBs at 1 ppm. Based on these results, ERRS excavated PCB-contaminated soil from three areas, labeled Excavation Areas A, B, and C (See Figure 4-22). Following excavation, START-2 collected samples (SS-35 through SS-42) and tested them with the Ensys field test kit. The results of the field testing indicated that many were still positive for PCBs at 1 ppm. One of the samples from each excavation area was submitted to the off-site laboratory, and the results for those samples (SS-36, SS-38, and SS-42) indicated that PCBs were not detected. Based on the laboratory results, the removal of PCB soil was considered complete at Building 206.

For Building 204, START-2 collected eight surface soil samples from around the suspected area of potential PCB contamination (See Figure 4-22). Ensys field testing indicated that all were negative for PCBs at 1 ppm. Therefore, no excavation was performed.

4.3.2 PCB Wipe Samples

START-2 also collected wipe samples from sections of steel in Building 200 (the radome). This building was primarily constructed of steel, with steel walls and floor panels installed on a network of steel beams. Samples were collected from areas of suspected contamination documented in USACE documents (E. P. Johnson 1997).

START-2 collected wipe samples from various metal surfaces inside Building 200. The wipe samples were collected with materials provided in the Ensys field test kits in accordance with the SSSP and the manufacturer's instructions. All wipe samples were discrete-location samples from metal surfaces inside the walls, floors, and steel beams. Wipe samples were collected with a sterile gauze pad and a pre-measured aliquot of methanol from an area of 100 square centimeters (cm^2) using a sterile, 10-centimeter by 10-centimeter template. After sampling, the wipe sample pad was placed in a pre-cleaned sample bottle. START-2 samplers changed gloves between each sample to prevent cross contamination. Samples were stored on ice at 4 °C until testing was performed.

The wipe sample were analyzed in the field with the Ensys immunoassay test kit to determine whether PCBs were present at the selected detection limit. The Ensys field test kits were based on an Aroclor 1260 standard with detection limits at 5 $\mu g/100\ cm^2$ or 10 $\mu g/100\ cm^2$. The results were compared to the applicable TSCA standard of 10 $\mu g/cm^2$ for PCB contamination on surfaces (40 CFR Part 761). Any positive detection with the Ensys field test kit was assumed to exceed the TSCA standard.

START-2 collected a total of 29 wipe samples for PCBs. Twenty seven of the wipe samples (WI-01 through WI-27) were collected from Building 200, and two (WI-28 and WI-29) were collected from the decontaminated excavator bucket after excavation of PCB-contaminated soil to determine the effectiveness of decontamination. These samples and the Ensys field test kit results are described in Table 4-6. The results indicated that 12 of the 27 wipe samples from Building 200 were positive for PCBs at the indicated detection limit. Based on these results, START-2 delineated the extent of contamination and flagged sections of steel beams and floor panels that were contaminated with PCBs. During the demolition of Building 200, START-2 worked closely with the ERRS equipment operator to ensure that PCB-contaminated steel was properly segregated from non-contaminated steel. The PCB-contaminated steel was then loaded for off-site disposal at a TSCA-approved facility. Non-contaminated steel was left for the steel scrapper (See Section 3.2.9). The two wipe samples (WI-28 and WI-29) collected from the decontaminated excavator bucket were negative (less than 10 $\mu g/100\ cm^2$), indicating that the buckets were not contaminated with PCBs following decontamination.

Table 4-1

**SUMMARY OF BULK SAMPLES FOR PLM ASBESTOS ANALYSES
COLLECTED BEFORE REMOVAL ACTION
BURNS ASBESTOS REMOVAL ACTION SITE
HARNEY COUNTY, OREGON**

DEQ Report Number	Sampling Agency	Sample Date	DEQ Lab Sample ID	EPA Sample ID	Sample Location	Sample Description	% Asbestos	Type of Asbestos
20020454	**DEQ**	**4/9/2002**	**Z3376**	**NA**	**Outside cement slab**	**Brown vinyl asbestos tile**	**5%**	**Chrysotile**
20020454	**DEQ**	**4/9/2002**	**Z3377**	**NA**	**Outside building with stacks**	**Piping insulation**	**10%**	**Chrysotile / Amosite Mixture**
20020454	**DEQ**	**4/9/2002**	**Z3378**	**NA**	**Dorm building marked 1995**	**Green vinyl asbestos tile flooring**	**8%**	**Chrysotile**
20020454	**DEQ**	**4/9/2002**	**Z4235**	**NA**	**Building to left at entrance**	**Cement asbestos board on ground**	**10%**	**Chrysotile**
20021144	**DEQ**	**10/2/2002**	**Z4216**	**NA**	**Outside hut near Dish Building**	**Cement asbestos board on ground**	**25%**	**Chrysotile**
20021144	**DEQ**	**10/2/2002**	**Z4148**	**NA**	**Hut near Dish Building**	**Vinyl asbestos tile on ground**	**5%**	**Chrysotile**
20021144	**DEQ**	**10/2/2002**	**Z4149**	**NA**	**Dish Building**	**Pipe wrap**	**60%**	**Chrysotile**
20021144	DEQ	10/2/2002	Z4185	**NA**	Brick building next to Power House	Piping insulation	ND	NA
20031075	DEQ	9/24/2003	Z4748	**NA**	Building 111	Piping insulation	ND	NA
20031075	DEQ	9/24/2003	Z4749	**NA**	Building 111	Ceiling tile with mastic	ND	NA
20031075	DEQ	9/24/2003	Z4750	**NA**	Building 109	Window putty - white	ND	NA
20031075	**DEQ**	**9/24/2003**	**Z4751**	**NA**	**Building 204**	**Aircell - outside**	**50%**	**Chrysotile**
20031075	DEQ	9/24/2003	Z4752	**NA**	Building 143	Hard wallboard	ND	NA
20031075	**DEQ**	**9/24/2003**	**Z4753**	**NA**	**Building 204**	**Duct covering**	**10%**	**Chrysotile / Amosite Mixture**
20031075	DEQ	9/24/2003	Z4754	**NA**	Building 105	Purple-blue roofing	ND	NA
20031075	DEQ	9/24/2003	Z4755	**NA**	Building 105	Black felt paper	ND	NA
20031075	**DEQ**	**9/24/2003**	**Z4756**	**NA**	**Building 105**	**Gray vinyl asbestos tile with black mastic**	**5%**	**Chrysotile**
20031075	**DEQ**	**9/24/2003**	**Z4757**	**NA**	**Building 105**	**Aircell ducting**	**80%**	**Chrysotile**

Table 4-1

SUMMARY OF BULK SAMPLES FOR PLM ASBESTOS ANALYSES
COLLECTED BEFORE REMOVAL ACTION
BURNS ASBESTOS REMOVAL ACTION SITE
HARNEY COUNTY, OREGON

DEQ Report Number	Sampling Agency	Sample Date	DEQ Lab Sample ID	EPA Sample ID	Sample Location	Sample Description	% Asbestos	Type of Asbestos
20040456	EPA / START-2	5/11/2004	Z4735	04050001	Building 143	Wallboard / joint compound	ND	NA
20040456	EPA / START-2	5/11/2004	Z4736	04050002	Building 143	Plaster	ND	NA
20040456	EPA / START-2	5/11/2004	Z4737	04050003	Building 147	Wallboard / tape	ND	NA
20040456	EPA / START-2	5/11/2004	Z4738	04050004	Building 147	Plaster	ND	NA
20040456	EPA / START-2	5/11/2004	Z4739	04050005	Building 147	Wire insulation	ND	NA
20040456	EPA / START-2	5/11/2004	Z4740	04050006	Building 151	Wallboard / tape	ND	NA
20040456	EPA / START-2	5/11/2004	Z4741	04050007	Building 204	Wallboard (ceiling) / tape	ND	NA
20040456	EPA / START-2	5/11/2004	Z4742	04050008	Building 204	Wallboard (wall)	ND	NA
20040456	EPA / START-2	5/11/2004	Z4743	04050009	Building 204	Particle board siding with / paint	ND	NA

Note: Bold type indicates that asbestos was detected in the sample.
A material is considered to be asbestos-containing (ACM) if it contains $\geq$ 1% asbestos.

Key:
ACM = Asbestos-containing material
DEQ = Oregon Department of Environmental Quality
EPA = Environmental Protection Agency
ID = identification number
ND = not detected
NA = not applicable
PLM = polarized light microscopy
RA = removal action
START = Superfund Technical Assessment and Response Team

Table 4-2

SUMMARY OF BULK SAMPLES FOR ASBESTOS PLM ANALYSIS
COLLECTED DURING REMOVAL ACTION
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Sample Number	EPA Sample ID	Date Collected	Building Number	Sampling Location	Material Type	Material Description	% Asbestos	Type of Asbestos
BM-01	04060601	6/15/2004	Building 111	Boiler room - NE corner	Pipe fill	Brown clayey fill material inside asbestos-cement pipe	ND	NA
BM-02	**04060602**	**6/16/2004**	**Building 130**	**NW corner - heater / blower**	**Glazing**	**Gray-white glazing on blower**	**3%**	**Chrysotile**
BM-03	**04060603**	**6/16/2004**	**Building 130**	**Boiler room**	**Boiler gasket**	**White braided boiler gasket**	**45%**	**Chrysotile**
BM-04	04060604	6/16/2004	Building 146	Boiler room	Paint	Silver paint on boiler	ND	NA
BM-05	04060605	6/16/2004	Building 146	Boiler room	Paint	White paint on boiler room floor	ND	NA
BM-06	04060606	6/16/2004	Building 146	Boiler room window	Window glazing	White paste / putty	ND	NA
BM-07	**04060607**	**6/16/2004**	**Building 200**	**South side**	**Tar paper**	**Tar paper wrap around fiberglass on steam line**	**80%**	**Chrysotile**
BM-08	04060608	6/16/2004	Building 200	South side vault	Tar paper	Tar paper lining over fiberglass on vault ceiling	ND	NA
BM-09	**04060609**	**6/16/2004**	**Building 200**	**South side vault**	**Block insulation**	**White block insulation**	**40%**	**30% Amosite 10% Crocidolite**
BM-10	**04060610**	**6/16/2004**	**Building 204**	**Cement slab outside of building**	**Floor tile - vinyl layer**	**9x9 floor tile - beige with white streaks**	**6%**	**Chrysotile**
					Floor tile - adhesive layer	Floor tile adhesive	ND	NA
BM-11	**04060611**	**6/16/2004**	**Building 204**	**Cement slab outside of building**	**Mastic**	**Floor tile mastic: black, tar-like**	**2%**	**Chrysotile**
BM-12	04060612	6/16/2004	Building 204	Roof - center	Roof fill	Tan, light-weight vermiculite	ND	NA
BM-13	04060613	6/16/2004	Building 204	Roof - center	Outer roof material	Black, bituminous tar-like	ND	NA
BM-14	04060614	6/16/2004	Building 204	Roof - west side	Outer roof material	Black, bituminous tar-like	ND	NA
BM-15	04060615	6/16/2004	Building 204	Roof - west side	Roof fill	Tan, light-weight vermiculite	ND	NA
BM-16	04060616	6/16/2004	Building 206	Roof - south side	Outer roof material	Built-up roof over wood fiber; tar-like, bituminous	ND	NA
BM-17	**04060617**	**6/16/2004**	**Building 204**	**Steam pipe on gound**	**Tar paper**	**Tar paper wrap around fiberglass on steam line**	**35%**	**Chrysotile**
BM-18	**04060618**	**6/16/2004**	**Tank 804**	**Base of tank**	**Caulk**	**Hard, brittle caulk / sealent at base of tank**	**20%**	**Chrysotile**

Table 4-2

SUMMARY OF BULK SAMPLES FOR ASBESTOS PLM ANALYSIS
COLLECTED DURING REMOVAL ACTION
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Sample Number	EPA Sample ID	Date Collected	Building Number	Sampling Location	Material Type	Material Description	% Asbestos	Type of Asbestos
BM-19	**04060619**	**6/16/2004**	**Building 155**	**Boiler room**	**Boiler insulation**	**White, fluffy loose-pack fill on boiler**	**40%**	**Chrysotile**
BM-20	04060620	6/16/2004	Building 155	Boiler room	Paint	Black / silver paint on boiler	ND	NA
BM-21	**04060621**	**6/16/2004**	**Building 155**	**Concrete slab inside building**	**Floor tile - vinyl layer**	**9 x 9 floor tile**	**2%**	**Chrysotile**
					Floor tile - adhesive layer	Floor tile adhesive	ND	NA
BM-22	04060622	6/16/2004	Building 155	Concrete slab inside building	Mastic	Floor tile mastic: black, tar-like	ND	NA
BM-23	04060623	6/16/2004	Building 143	Boiler room	Mineral wool	Fibrous, black / brown insulation inside boiler	ND	NA
BM-24	04060624	6/16/2004	Building 143	Boiler room	Boiler fill	Gray / black loose fill in bottom of boiler	ND	NA
BM-25	04060625	6/16/2004	Building 143	Boiler room	Paint	Silver paint on boiler	ND	NA
BM-26	04060626	6/21/2004	Building 155	Boiler room	Tar paper	Tar backing on fiberglass wall insulation	ND	NA
BM-27	04060627	6/21/2004	Building 155	Boiler room	Refractory	Cement-like lining inside the boiler	ND	NA
BM-28	04060628	6/22/2004	Building 155	Boiler room	Refractory glazing	White glazing / sealent near refractory inside boiler	ND	NA
BM-29	**04060629**	**6/23/2004**	**Building 204**	**Steam line (on retaining wall)**	**Insulation**	**White fibrous insulation**	**60%**	**Amosite**
BM-30	**04060630**	**6/23/2004**	**Building 204**	**Steam Line (on ground)**	**Tar**	**Black tar from steam line**	**10%**	**Amosite**
BM-31	**04060631**	**6/22/2004**	**Building 204**	**Steam Line (on ground)**	**Insulation**	**White fibrous insulation**	**80%**	**Amosite**
BM-32	04060632	6/25/2004	Building 204	Duct above ceiling	Duct insulation	Fiberglass with black tar backing	ND	NA
BM-33	04060633	6/25/2004	Building 204	Duct in air room	Duct insulation	Tar paper / fiberglass	ND	NA
BM-34	04060634	6/25/2004	Building 204	Water line above ceiling	Duct insulation	Tar paper / fiberglass	ND	NA

Table 4-2

SUMMARY OF BULK SAMPLES FOR ASBESTOS PLM ANALYSIS
COLLECTED DURING REMOVAL ACTION
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Sample Number	**EPA Sample ID**	**Date Collected**	**Building Number**	**Sampling Location**	**Material Type**	**Material Description**	**% Asbestos**	**Type of Asbestos**
BM-35	04060635	6/25/2004	Near FAA	Tank support	Felt material	Felt material on tank support	ND	NA
BM-36	04060636	6/25/2004	Near FAA	Tank support	Cement / mastic	Cement material with mastic on tank support	ND	NA
BM-37	04060637	6/25/2004	Near FAA	Tank support	Paint / caulk	White paint / caulk on tank support	ND	NA

Note: Bold type indicates that asbestos was detected in the sample.
A material is considered to be asbestos-containing (ACM) if it contains $\geq$ 1% asbestos.

Key:
ACM = Asbestos-containing material
DEQ = Oregon Department of Environmental Quality
EPA = Environmental Protection Agency
FAA = Federal Aviation Agency
ID = identification number
ND = not detected
NA = not applicable
PLM = polarized light microscopy
RA = removal action
START = Superfund Technical Assessment and Response Team

Table 4-3

SUMMARY OF ASBESTOS ANALYTICAL RESULTS
AMBIENT AIR SAMPLES
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Station ID	EPA Sample ID	Date Collected	General Area Description	Sampling Location	Sample Type	Sampling Duration (minutes)	Sample Volume (liters)	On-Site PCM Results (fibers/cc)	Off-Site PCM Results (fibers/cc)	Off-Site TEM Results (structures/cc)
OSHA Permissible Exposure Limit (8-hour TWA)								**0.1**	**0.1**	**0.1**
AHERA Clearance Limit								**0.01**	**0.01**	**0.01**
0611-A	04060501	6/11/2004	Upwind of site activities	Tennis court, approx. 68 feet from Command Post	PCM	506	4,554	< LOD (1)	n/a	n/a
0611-B	04060502	6/11/2004	Downwind of demolition	Approx. 100 feet south-southeast of Bldg. 111	PCM	499	4,491	< LOD (1)	n/a	n/a
0611-C	04060503	6/11/2004	Downwind of demolition	Approx. 45 feet east of Bldg. 111	PCM	500	4,500	< LOD (1)	n/a	n/a
0611-D	04060504	6/11/2004	Downwind of fire-damaged bldg.	Approx. 56 feet southeast of Bldg. 149	PCM	448	4,032	< LOD (1)	n/a	n/a
0612-A	04060505	6/12/2004	Upwind of site activities	Tennis court, approx. 68 feet from Command Post	PCM	440	3,740	void - not analyzed (2)	n/a	n/a
0612-B	04060506	6/12/2004	Downwind of demolition	Approx. 45 feet east of Bldg. 111	PCM	426	3,621	< LOD (1)	n/a	n/a
0612-C	04060507	6/12/2004	Downwind of demolition	Approx. 100 feet south-southeast of Bldg. 111	PCM	425	3,613	< LOD (1)	n/a	n/a
0612-D	04060508	6/12/2004	Downwind of fire-damaged bldg.	Approx. 56 feet southeast of Bldg. 149	PCM	419	3,562	< LOD (1)	n/a	n/a
0614-A	04060509	6/14/2004	Upwind of site activities	Tennis court, approx. 68 feet from Command Post	PCM	345	3,105	< LOD (1)	< 0.0009	n/a
0614-B	04060510	6/14/2004	Downwind of demolition	On Bldg. 107 pad, approx. 65 feet east of Bldg.105	PCM	327	2,943	void - overloaded (3)	n/a	n/a
0614-C	04060511	6/14/2004	Downwind of demolition	Approx. 190 feet southeast of Bldg. 105	PCM	327	2,943	**0.0012**	**0.001**	n/a
0615-A	04060512	6/15/2004	Upwind of site activities	Tennis court, approx. 68 feet from Command Post	PCM	586	5,274	< LOD (1)	n/a	n/a
0615-B	04060513	6/15/2004	Command Post area	In front of Command Post trailers, facing Bldg. 111	PCM	583	5,247	< LOD (1)	n/a	n/a
0615-C	04060514	6/15/2004	Downwind of demolition	On Bldg. 107 pad, approx 65 feet east of Bldg.105	PCM	225	2,025	< LOD (1)	n/a	n/a
0615-D	04060515	6/15/2004	Downwind of demolition	Co-located with Sample # 0615-C	TEM	227	1,703	n/a	n/a	< 0.0039
0615-E	04060516	6/15/2004	Downwind of demolition	Approx. 190 feet southeast of Bldg. 105	PCM	548	4,932	< LOD (1)	n/a	n/a
0615-F	04060517	6/15/2004	Downwind of demolition	Approx. 5 feet west of Bldg. 109	PCM	193	1,737	< LOD (1)	n/a	n/a
0616-A	04060518	6/16/2004	Downwind of demolition	Tennis court, approx. 68 feet from Command Post	PCM	704	6,336	**0.00070**	n/a	n/a
0616-B	04060519	6/16/2004	Upwind of site activities	Approx. 38 feet east-northeast of Bldg. 111	PCM	707	6,363	**0.00089**	n/a	n/a
0616-C	04060520	6/16/2004	Upwind of site activities	Approx. 80 feet east-southeast of Bldg. 111	PCM	700	6,125	< LOD (1)	n/a	n/a
0616-D	04060521	6/16/2004	Downwind of demolition	Approx. 73 feet west of Bldg. 111	PCM	311	2,799	**0.0053**	n/a	n/a
0616-E	04060522	6/16/2004	Downwind of demolition	Approx. 73 feet west of Bldg. 111	PCM	330	2,970	**0.00099**	n/a	n/a
0616-F	04060523	6/16/2004	Downwind of demolition	Co-located with Sample # 0616-E	TEM	335	2,931	n/a	n/a	< 0.0029
0617-A	04060524	6/17/2004	Downwind of demolition	Tennis court, approx. 68 feet from Command Post	PCM	587	5,283	**0.00065**	n/a	n/a
0617-B	04060525	6/17/2004	Upwind of site activities	Approx. 80 feet east-southeast of Bldg. 111	PCM	516	4,515	< LOD (1)	n/a	n/a
0617-C	04060526	6/17/2004	Downwind of demolition	Approx. 45 feet east of Command Post trailers	PCM	290	2,610	**0.0023**	**0.003**	n/a
0617-D	04060527	6/17/2004	Downwind of demolition	Co-located with Sample # 0617-C	TEM	286	2,574	n/a	n/a	< 0.0033
0617-E	04060528	6/17/2004	Adjacent to demolition	Approx. 78 feet south of Bldg. 111	PCM	486	4,374	< LOD (1)	n/a	n/a
0617-F	04060529	6/17/2004	Downwind of demolition	Approx. 45 feet east of Command Post trailers	PCM	236	2,124	< LOD (1)	n/a	n/a
0617-G	04060530	6/17/2004	Downwind of demolition	Approx. 38 feet east of Bldg. 166's east side	PCM	59	177	< LOD (1)	n/a	n/a

Table 4-3

SUMMARY OF ASBESTOS ANALYTICAL RESULTS
AMBIENT AIR SAMPLES
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Station ID	EPA Sample ID	Date Collected	General Area Description	Sampling Location	Sample Type	Sampling Duration (minutes)	Sample Volume (liters)	On-Site PCM Results (fibers/cc)	Off-Site PCM Results (fibers/cc)	Off-Site TEM Results (structures/cc)
OSHA Permissible Exposure Limit (8-hour TWA)								**0.1**	**0.1**	**0.1**
AHERA Clearance Limit								**0.01**	**0.01**	**0.01**
0618-A	04060531	6/18/2004	Adjacent to ACM abatement	Approx. 41 feet west-southwest of Bldg. 143	PCM	110	1,650	< LOD (1)	n/a	n/a
0618-B	04060532	6/18/2004	Adjacent to ACM abatement	Co-located with Sample # 0618-A	TEM	108	1,242	n/a	n/a	< 0.0045
0618-C	04060533	6/18/2004	Downwind of demolition	Approx. 50 feet east of Bldg. 111 debris pile	PCM	231	3,350	< LOD (1)	n/a	n/a
0618-D	04060534	6/18/2004	Downwind of demolition	Approx. 50 feet east of Bldg. 146	PCM	278	4,101	< LOD (1)	n/a	n/a
0618-E	04060535	6/18/2004	Downwind of demolition	Approx. 50 feet east of Bldg. 152	PCM	259	3,108	< LOD (1)	n/a	n/a
0618-F	04060536	6/18/2004	Downwind of ACM abatement	Approx. 10 feet east of Bldg. 149, at mid-building	PCM	107	1,578	< LOD (1)	n/a	n/a
0619-A	04060537	6/19/2004	Downwind of demolition	Approx. 40 feet southeast of Bldg. 152	PCM	496	3,968	< LOD (1)	n/a	n/a
0619-B	04060538	6/19/2004	Downwind of demolition	Approx. 30 feet southeast of Bldg. 158	TEM	488	3,904	n/a	n/a	< 0.0021 (4)
0619-C	04060539	6/19/2004	Adjacent to ACM abatement	Approx. 8 feet south of Bldg. 155's boiler room	PCM	466	3,728	< LOD (1)	n/a	n/a
0619-D	04060540	6/19/2004	Downwind of demolition	Approx. 50 feet southeast of Bldg. 111 debris pile	PCM	407	3,256	**0.00090**	n/a	n/a
0619-E	04060541	6/19/2004	Adjacent to ACM abatement	Approx 10 feet west of Bldg. 155, in NAM exhaust	PCM	292	2,920	< LOD (1)	n/a	n/a
OA-30 (6)	n/a	6/19/2004	Outside decon entrance	Bldg. 155 boiler room	PCM	241	1,928	**0.0022**	n/a	n/a
0621-A	04060542	6/21/2004	Downwind of demolition	Approx. 50 feet west of Bldg. 143	TEM	557	3,760	n/a	n/a	< 0.0022
0621-B	04060543	6/21/2004	Downwind of demolition	Approx. 50 feet west of Bldg. 147	PCM	553	3,733	**0.0020**	n/a	n/a
0621-C	04060544	6/21/2004	Downwind of ACM abatement	Approx. 6 feet west of Bldg. 159 west entrance	PCM	457	3,085	< LOD (1)	n/a	n/a
0621-D	04060545	6/21/2004	Clearance Sample - inside abated structure	Inside Bldg. 155's boiler room	PCM	133	1,463	< LOD (1)	< 0.0020	n/a
CL-36 (6)	n/a	6/21/2004	Clearance Sample - inside abated structure	Inside Bldg. 155's boiler room	PCM	133	1,463	**0.0020**	n/a	n/a
0622-A	04060546	6/22/2004	Downwind of demolition	Approx. 50 feet west of Bldg. 147	PCM	615	3,690	< LOD (1) J-	n/a	n/a
0622-B	04060547	6/22/2004	Downwind of demolition	Approx. 50 feet west of Bldg. 151	TEM	612	3,672	n/a	n/a	< 0.0023 (4)
0622-C	04060548	6/22/2004	Adjacent to ACM abatement	Approx. 10 feet west of Bldg. 159, in NAM exhaust	PCM	481	2,886	< LOD (1)	n/a	n/a
0622-D	04060549	6/22/2004	Downwind of ACM abatement	Approx. 10 feet southwest of Bldg. 159	PCM	599	3,594	< LOD (1)	n/a	n/a
0622-E	04060550	6/22/2004	Downwind of demolition	Approx. 60 feet west of Bldg. 111 debris pile	PCM	594	3,564	**0.0025 J+**	n/a	n/a
0623-A	04060551	6/23/2004	Downwind of demolition	Approx. 50 feet west of Bldg. 149	PCM	337	2,022	**0.0018**	n/a	n/a
0623-B	04060552	6/23/2004	Downwind of ACM abatement	Approx. 25 feet west of Bldg. 165	PCM	318	2,862	< LOD (1)	n/a	n/a
0623-C	04060553	6/23/2004	Downwind of demolition	Approx. 25 feet west of Bldg. 159	TEM	279	1,674	n/a	n/a	< 0.0050
0623-D	04060554	6/23/2004	Downwind of demolition	Approx. 50 feet northeast of Bldg. 130	PCM	499	2,994	**0.0031**	void - overloaded (3)	n/a
0624-A	04060555	6/24/2004	Downwind of ACM abatement	Approx. 20 feet east of Bldg 200	PCM	336	3,024	< LOD (1)	n/a	n/a
0624-B	04060556	6/24/2004	Downwind of demolition	Approx. 50 feet east of Bldg. 155	TEM	431	2,155	n/a	n/a	< 0.0037
0624-C	04060557	6/24/2004	Downwind of demolition	Approx. 20 feet east of Bldg . 143	PCM	419	2,095	**0.0014**	**0.007**	n/a
0624-D	04060558	6/24/2004	Upwind of site activities	Tennis court, approx. 68 feet from Command Post	PCM	548	2,740	< LOD (1)	n/a	n/a
0624-E	04060559	6/24/2004	N/A	Field Blank	PCM	n/a	n/a	n/a	<LOD (NFD)	n/a
0624-F	04060560	6/24/2004	N/A	Field Blank	TEM	n/a	n/a	n/a	n/a	<LOD (NFD)
0624-G	04060561	6/24/2004	Downwind of demolition	Approx. 50 feet east-northeast of Bldg. 207	PCM	209	1,881	< LOD (1)	n/a	n/a
0624-H	04060562	6/24/2004	Downwind of demolition	Approx. 50 feet east of Bldg. 200	PCM	109	1,308	< LOD (1)	n/a	n/a

Table 4-3

SUMMARY OF ASBESTOS ANALYTICAL RESULTS
AMBIENT AIR SAMPLES
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Station ID	EPA Sample ID	Date Collected	General Area Description	Sampling Location	Sample Type	Sampling Duration (minutes)	Sample Volume (liters)	On-Site PCM Results (fibers/cc)	Off-Site PCM Results (fibers/cc)	Off-Site TEM Results (structures/cc)
OSHA Permissible Exposure Limit (8-hour TWA)								**0.1**	**0.1**	**0.1**
AHERA Clearance Limit								**0.01**	**0.01**	**0.01**
0625-A	04060563	6/25/2004	Adjacent to demolition	Approx. 30 feet north of Bldg. 200	PCM	547	2,735	**0.0015**	n/a	n/a
0625-B	04060564	6/25/2004	Downwind of ACM abatement	Approx. 100 feet north of Bldg 204	PCM	547	2,735	< LOD (1)	n/a	n/a
0626-A	04060589	6/26/2004	Downwind of ACM abatement	Approx. 50 feet south of Bldg. 151 debris pile	PCM	414	2,070	< LOD (1)	n/a	n/a
0626-B	04060565	6/26/2004	Downwind of ACM abatement	Approx. 75 feet southeast of Bldg. 200 debris pile	TEM	404	2,020	n/a	n/a	**0.0040**
0626-C	04060566	6/26/2004	Adjacent to ACM abatement	Approx. 10 feet south of Bldg. 204	PCM	367	1,835	< LOD (1)	n/a	n/a
0626-D	04060567	6/26/2004	Adjacent to ACM abatement	Approx. 10 feet north of Bldg. 204	PCM	343	1,715	< LOD (1)	n/a	n/a
0628-A	04060568	6/28/2004	Adjacent to ACM abatement	Approx.10 feet south of Bldg. 204, in NAM exhaust	PCM	559	2,795	< LOD (1)	n/a	n/a
0628-B	04060569	6/28/2004	Adjacent to ACM abatement	Approx. 10 feet north of Bldg 204	TEM	508	2,540	n/a	n/a	**0.0095**
0628-C	04060570	6/28/2004	Downwind of demolition	Approx. 25 feet northwest of Bldg. 147	PCM	483	2,415	< LOD (1)	n/a	n/a
0628-D	04060571	6/28/2004	Downwind of demolition	Approx. 25 feet west of Bldg. 159	PCM	481	2,405	< LOD (1)	n/a	n/a
0629-A	04060572	6/29/2004	Adjacent to ACM abatement	Approx. 10 feet north of Bldg. 204	PCM	526	2,630	< LOD (1)	**0.011**	n/a
0629-B	04060573	6/29/2004	Adjacent to ACM abatement	Approx. 10 feet south of Bldg. 204	PCM	500	2,500	< LOD (1)	n/a	n/a
0629-C	04060574	6/29/2004	Downwind of ACM abatement	Approx. 25 feet west of Bldg. 155 debris pile	TEM	465	2,325	n/a	n/a	**0.0069**
0629-D	04060575	6/29/2004	Downwind of demolition	Approx. 10 feet north of Bldg. 155 on northwest side	PCM	444	2,220	< LOD (1)	n/a	n/a
0629-E	04060576	6/29/2004	Downwind of demolition	At north entrance to Bldg. 149	PCM	420	2,100	< LOD (1)	n/a	n/a
0630-A	04060577	6/30/2004	Adjacent to ACM abatement	Approx. 10 feet south of Bldg. 204, in NAM exhaust	TEM	554	2,770	n/a	n/a	< 0.0029
0630-B	04060578	6/30/2004	Adjacent to ACM abatement	Approx. 10 feet north of Bldg. 204	PCM	525	2,625	**0.0027**	n/a	n/a
0630-C	04060579	6/30/2004	Downwind of demolition	Next to Bldg. 151 foundation, midway on south side	PCM	503	2,515	< LOD (1)	n/a	n/a
0630-D	04060580	6/30/2004	Downwind of demolition	At east entrance to Bldg. 147	PCM	387	1,935	< LOD (1)	n/a	n/a
0630-E	04060581	6/30/2004	Clearance Sample - inside abated structure	Inside Bldg. 204's mechanical room	PCM	89	1,424	**0.0026**	n/a	n/a
CL-88 (6)	n/a	6/30/2004	Clearance Sample - inside abated structure	Inside Bldg. 204's mechanical room	PCM	89	1,424	**0.0040**	n/a	n/a
0630-F	04060582	6/30/2004	Clearance Sample - inside abated structure	Inside Bldg. 204's main room	PCM	89	1,424	**0.0041**	**0.003**	n/a
CL-89 (6)	n/a	6/30/2004	Clearance Sample - inside abated structure	Inside Bldg. 204's mechanical room	PCM	89	1,424	< LOD (1)	n/a	n/a
0701-A	04060583	7/1/2004	Downwind of demolition	At east entrance to Bldg. 151	PCM	422	3,798	n/a	**0.001**	n/a
0701-B	04060584	7/1/2004	Downwind of metal recycling	Approx. 25 feet southeast of scrap metal crusher; Bldg 143	TEM	362	3,258	n/a	n/a	**0.0160 (5)**
0701-C	04060585	7/1/2004	Downwind of demolition	Approx. 50 feet west of Tank 800	PCM	293	2,930	n/a	< 0.0009	n/a

Table 4-3

SUMMARY OF ASBESTOS ANALYTICAL RESULTS
AMBIENT AIR SAMPLES
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Station ID	EPA Sample ID	Date Collected	General Area Description	Sampling Location	Sample Type	Sampling Duration (minutes)	Sample Volume (liters)	On-Site PCM Results (fibers/cc)	Off-Site PCM Results (fibers/cc)	Off-Site TEM Results (structures/cc)
OSHA Permissible Exposure Limit (8-hour TWA)								**0.1**	**0.1**	**0.1**
AHERA Clearance Limit								**0.01**	**0.01**	**0.01**
0702-A	04060586	7/2/2004	Downwind of demolition	At east entrance to Bldg. 151	PCM	258	2,322	n/a	< 0.001	n/a
0702-B	04060587	7/2/2004	Downwind of demolition	Approx. 50 feet west of Tank 800	PCM	257	2,313	n/a	**0.002**	n/a
0702-C	04060588	7/2/2004	Adjacent to metal recycling	Approx. 50 feet north of scrap metal crusher; Bldg. 130	TEM	263	2,367	n/a	n/a	< 0.0729 (5)
0716-A	04060590	7/16/2004	N/A	Field Blank	PCM	n/a	n/a	n/a	< LOD (NFD)	n/a
0716-B	04060591	7/16/2004	N/A	Field Blank	TEM	n/a	n/a	n/a	n/a	< LOD (NFD)

Note: Unless otherwise indicated, samples were collected by START-2
Bold type indicates sample concentration is greater than the detection limit.
(1) The on-site PCM analyst did not report a numerical LOD. Based on sample volumes and fiber counts, the typical LOD would be no greater than 0.001 fibers/cc.
(2) Sample 0612-A could not be analyzed because the filter cassette was assembled backwards.
(3) Sample 0614-B could not be analyzed because it was overloaded with dust.
(4) Samples 0619-B and 0622-B each contained one Asbestiform Libby Amphibole fiber, which is not currently defined as an asbestos fiber. The results were not included in the final concentration.
(5) These samples were overloaded with dust and could not be analyzed by the direct TEM method. They were analyzed by the indirect transfer method, and the results should be considered as estimates.
(6) Sample was collected by Advantage Environmental (ERRS subcontractor), not START-2.

Key:

ACM	= asbestos-containing material
AHERA	= Asbestos Hazard Emergency Response Act
cc	= cubic centimeter
J	= Results are estimated (filter was loaded with dust and debris)
J+	= Results are estimated (results are biased high)
J-	= Results are estimated (results are biased low)
LOD	= limit of detection
n/a	= not analyzed or not applicable
NAM	= negative air machine
NFD	= no fibers detected
PCM	= phase contrast microscopy
PEL	= permissible exposure limit
OSHA	= Occupational Safety and Health Administration
TEM	= transmission electron microscopy
TWA	= time weighted average

Table 4-4

SUMMARY OF SOIL PCB RESULTS - COMPARISON OF ENSYS FIELD TEST AND ANALYTICAL LABORATORY RESULTS
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Station ID	EPA Sample ID	Sample Date	Location	Description	Ensys PCB Field Test Kit (Aroclor 1260 Standard) 1 ppm	10 ppm	Analytical Lab PCB Results (mg/kg) Aroclor 1254 (1)	Ensys / Lab Comparison (2)
SS-01	04060701	6/19/2004	Building 200	Surface sample	**≥ 1 ppm**	NT	**8.1**	OK
SS-02	04060702	6/19/2004	Building 200	Surface sample	**≥ 1 ppm**	NT	NT	N/A
SS-03	04060703	6/19/2004	Building 200	Surface sample	**≥ 1 ppm**	NT	NT	N/A
SS-04	04060704	6/19/2004	Building 200	Surface sample	**≥ 1 ppm**	NT	NT	N/A
SS-05	04060705	6/19/2004	Building 200	Surface sample	**≥ 1 ppm**	NT	**1.72**	OK
SS-06	04060706	6/21/2004	Command Post	Background sample	< 1 ppm	NT	0.098 U	OK
SS-07	04060707	6/22/2004	Building 133	Surface sample	< 1 ppm (composite)	NT	NT	N/A
SS-08	04060708	6/22/2004	Building 133	Surface sample		NT	NT	N/A
SS-09	04060709	6/22/2004	Building 133	Surface sample	< 1 ppm	NT	0.0975 U	OK
SS-10	04060710	6/22/2004	Building 133	Surface sample	< 1 ppm	NT	NT	N/A
SS-11	04060711	6/22/2004	Building 133	Surface sample	**≥ 1 ppm**	NT	NT	N/A
SS-12	04060712	6/22/2004	Building 133	Surface sample	< 1 ppm	NT	NT	N/A
SS-13	04060713	6/22/2004	Building 133	Surface sample	< 1 ppm	NT	NT	N/A
SS-14	04060714	6/22/2004	Building 200	Surface sample	**≥ 1 ppm / ≥ 1 ppm (duplicate)**	< 10 ppm	NT	N/A
SS-15	04060715	6/22/2004	Building 200	Surface sample - exterior	< 1 ppm	NT	NT	N/A
SS-16	04060716	6/22/2004	Building 200	Surface sample - exterior	< 1 ppm	NT	NT	N/A
SS-17	04060717	6/22/2004	Building 204	Surface sample	< 1 ppm	NT	NT	N/A
SS-18	04060718	6/22/2004	Building 204	Surface sample	< 1 ppm	NT	NT	N/A
SS-19	04060719	6/22/2004	Building 204	Surface sample	< 1 ppm	NT	NT	N/A
SS-20	04060720	6/22/2004	Building 204	Surface sample	< 1 ppm	NT	NT	N/A
SS-21	04060721	6/22/2004	Building 204	Surface sample	< 1 ppm	NT	NT	N/A
SS-22	04060722	6/22/2004	Building 204	Surface sample	< 1 ppm	NT	NT	N/A
SS-23	04060723	6/22/2004	Building 204	Surface sample	< 1 ppm	NT	NT	N/A
SS-24	04060724	6/22/2004	Building 204	Surface sample	< 1 ppm	NT	NT	N/A
SS-25	04060725	6/22/2004	Building 206	Surface sample	< 1 ppm	NT	NT	N/A
SS-26	04060726	6/22/2004	Building 206	Surface sample	**≥ 1 ppm / ≥ 1 ppm (duplicate)**	NT	NT	N/A
SS-27	04060727	6/22/2004	Building 206	Surface sample	**≥ 1 ppm**	NT	NT	N/A
SS-28	04060728	6/22/2004	Building 206	Surface sample	**≥ 1 ppm**	NT	NT	N/A
SS-29	04060729	6/22/2004	Building 206	Surface sample	< 1 ppm	NT	NT	N/A
SS-30	04060730	6/22/2004	Building 206	Surface sample	< 1 ppm	NT	NT	N/A
SS-31	04060731	6/28/2004	Building 133	Bottom of excavation	**≥ 1 ppm (3)**	< 10 ppm	0.118 U	1 ppm: FP 10 ppm: OK
SS-32	04060732	6/28/2004	Building 133	Bottom of excavation	**≥ 1 ppm (3)**	NT	NT	N/A
SS-33	04060733	6/28/2004	Building 133	Bottom of excavation	< 1 ppm (3)	NT	NT	N/A
SS-34	04060734	6/28/2004	Building 133	Bottom of excavation	**≥ 1 ppm (3)**	< 10 ppm	NT	N/A
SS-35	04060735	6/28/2004	Building 206 - A	Bottom of excavation A	< 1 ppm (3)	NT	NT	N/A
SS-36	04060736	6/28/2004	Building 206 - A	Bottom of excavation A	**≥ 1 ppm (3)**	< 10 ppm	0.121 U	1 ppm: FP 10 ppm: OK
SS-37	04060737	6/28/2004	Building 206 - B	Bottom of excavation B	NT	NT	NT	N/A
SS-38	04060738	6/28/2004	Building 206 - B	Bottom of excavation B	**≥ 1 ppm (3)**	< 10 ppm	0.111 U	1 ppm: FP 10 ppm: OK
SS-39	04060739	6/28/2004	Building 206 - B	Bottom of excavation B	NT	NT	NT	N/A
SS-40	04060740	6/28/2004	Building 206 - B	Bottom of excavation B	**≥ 1 ppm (3)**	< 10 ppm	NT	N/A
SS-41	04060741	6/28/2004	Building 206 - C	Bottom of excavation C	**≥ 1 ppm (3)**	NT	NT	N/A
SS-42	04060742	6/28/2004	Building 206 - C	Bottom of excavation C	**≥ 1 ppm (3)**	< 10 ppm	0.117 U	1 ppm: FP 10 ppm: OK
SS-43	04060743	6/28/2004	Building 200	Bottom of 1st excavation	**≥ 1 ppm**	**≥ 10 ppm**	**8.85 J**	1 ppm: OK 10 ppm: DL
SS-44	04060744	6/28/2004	Building 200	Bottom of 1st excavation	< 1 ppm	< 10 ppm	NT	N/A
SS-45	04060745	6/28/2004	Building 200	Bottom of 1st excavation	< 1 ppm	< 10 ppm	NT	N/A
SS-46	04060746	6/28/2004	Building 200	Bottom of 1st excavation	< 1 ppm	< 10 ppm	NT	N/A
SS-47	04060747	6/28/2004	Building 200	Bottom of 1st excavation	**≥ 1 ppm**	< 10 ppm	NT	N/A
SS-48	04060748	6/28/2004	Building 200	Bottom of 1st excavation	**≥ 1 ppm**	< 10 ppm	**0.384**	1 ppm: DL 10 ppm: OK

Table 4-4

SUMMARY OF SOIL PCB RESULTS - COMPARISON OF ENSYS FIELD TEST AND ANALYTICAL LABORATORY RESULTS
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Station ID	EPA Sample ID	Sample Date	Location	Description	Ensys PCB Field Test Kit (Aroclor 1260 Standard)		Analytical Lab PCB Results (mg/kg)	Ensys / Lab Comparison [(2)]
					1 ppm	10 ppm	Aroclor 1254 [(1)]	
SS-49	04060749	7/1/2004	Building 200	Bottom of 2nd excavation	NT	NT	**4.42 J**	N/A
SS-50	04060750	7/1/2004	Building 200	Bottom of 2nd excavation	NT	NT	**145**	N/A
SS-51	04060751	7/1/2004	Building 200	Bottom of 2nd excavation	NT	NT	**0.159**	N/A
SS-52	04060752	7/1/2004	Building 200	Bottom of 2nd excavation	NT	NT	**2.13**	N/A
SS-53	04100001	10/12/2004	Building 200	Bottom of 3rd excavation	**≥ 1 ppm**	< 10 ppm	NT	N/A
SS-54	04100002	10/12/2004	Building 200	Bottom of 3rd excavation	**≥ 1 ppm**	< 10 ppm	NT	N/A
SS-55	04100003	10/12/2004	Building 200	Bottom of 3rd excavation	**≥ 1 ppm**	**≥ 10 ppm**	NT	N/A
SS-56	04100004	10/12/2004	Building 200	Bottom of 3rd excavation	**≥ 1 ppm**	< 10 ppm	NT	N/A
SS-57	04100005	10/13/2004	Building 200	Bottom of final excavation	NT	< 10 ppm	**0.81**	OK
SS-58	04100006	10/13/2004	Building 200	Bottom of final excavation	NT	< 10 ppm	**0.245**	OK
SS-59	04100007	10/13/2004	Building 200	Bottom of final excavation	NT	< 10 ppm	**2.4**	OK
SS-60	04100008	10/13/2004	Building 200	Bottom of final excavation	NT	< 10 ppm	**1.48 J**	OK
SS-61	04100009	10/13/2004	Building 200	Bottom of final excavation	NT	< 10 ppm	**0.218**	OK
SS-62	04100010	10/13/2004	Building 200	Bottom of final excavation	NT	< 10 ppm	**2.74 J**	OK
SS-63	04100011	10/13/2004	Building 200	Bottom of final excavation	NT	**≥ 10 ppm**	NT	N/A
SS-64	04100012	10/13/2004	Building 200	Bottom of final excavation	NT	< 10 ppm	**0.494**	OK
SS-65	04100013	10/13/2004	Building 200	Bottom of final excavation	NT	< 10 ppm	**0.246**	OK
SS-66	04100014	10/13/2004	Building 200	Bottom of final excavation	NT	< 10 ppm	**2.94**	OK
SS-67	04100015	10/14/2004	Building 200	1' below SS-63	NT	NT	**0.0672 J**	N/A

Notes: Results in bold typeface indicate a positive result.

[(1)] Aroclor 1254 was the only PCB detected in these samples.

[(2)] See the key for an explanation of the comparison results.

[(3)] These results were obtained from a suspect Ensys testing batch that resulted in several false positives, as compared to the analytical laboratory results.

Key:

EPA = Environmental Protection Agency
FP = Ensys result is a False Positive (Ensys indicated a hit, while the analytical result did not).
DL = Ensys and analytical laboratory results don't agree on Detection Limit (both indicate detections, but DLs do not match).
ID = identification
J = estimated value
mg/kg = milligrams per kilogram
N/A = not applicable
NT = not tested
OK = Ensys result matched analytical result.
PCB = polychlorinated biphenyl
ppm = parts per million
SS = surface soil sample
U = The associated numerical value is the sample quantitation limit.

Table 4-5

SUMMARY OF SOIL PCB RESULTS - ANALYTICAL LABORATORY
BURNS ASBESTOS REMOVAL ACTION
HARNEY, OREGON

EPA Sample ID	**04060701**	**04060705**	**04060706**	**04060709**	**04060731**	**04060736**	**04060738**	**ODEQ PCB Remedy Residential Soil PRGs**	**ODEQ PCB Remedy Industrial Soil PRGs**
Station ID	**SS-01**	**SS-05**	**SS-06**	**SS-09**	**SS-31**	**SS-36**	**SS-38**		
Sample Depth (feet bgs)	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**		
Description	**Building 200 before excavation**	**Building 200 before excavation**	**Command Post / Background**	**Building 133 before excavation**	**Building 133 after excavation**	**Building 206 after excavation (Area A)**	**Building 206 after excavation (Area B)**		
PCBs (mg/kg)									
Aroclor 1016	0.485 U	0.094 U	0.098 U	0.0975 U	0.118 U	0.121 U	0.111 U	na	na
Aroclor 1221	0.485 U	0.094 U	0.098 U	0.0975 U	0.118 U	0.121 U	0.111 U	na	na
Aroclor 1232	0.485 U	0.094 U	0.098 U	0.0975 U	0.118 U	0.121 U	0.111 U	na	na
Aroclor 1242	0.485 U	0.094 U	0.098 U	0.0975 U	0.118 U	0.121 U	0.111 U	na	na
Aroclor 1248	0.485 U	0.094 U	0.098 U	0.0975 U	0.118 U	0.121 U	0.111 U	na	na
Aroclor 1254	**8.1**	**1.72**	0.098 U	0.0975 U	0.118 U	0.121 U	0.111 U	na	na
Aroclor 1260	0.485 U	0.094 U	0.098 U	0.0975 U	0.118 U	0.121 U	0.111 U	na	na
Total PCBs	***8.1***	***1.72***	0.686 U	0.6825 U	0.826 U	0.847 U	0.777 U	1.2	7.5

Table 4-5

SUMMARY OF SOIL PCB RESULTS - ANALYTICAL LABORATORY
BURNS ASBESTOS REMOVAL ACTION
HARNEY, OREGON

EPA Sample ID	**04060742**	**04060743**	**04060748**	**04060749**	**04060750**	**04060751**	**04060752**	**ODEQ PCB Remedy Residential Soil PRGs**	**ODEQ PCB Remedy Industrial Soil PRGs**
Station ID	**SS-42**	**SS-43**	**SS-48**	**SS-49**	**SS-50**	**SS-51**	**SS-52**		
Sample Depth (feet bgs)	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**		
Description	**Building 206 after excavation (Area C)**	**Building 200 after 1st excavation**	**Building 200 after 1st excavation**	**Building 200 after 2nd excavation**	**Building 200 after 2nd excavation**	**Building 200 after 2nd excavation**	**Building 200 after 2nd excavation**		
PCBs (mg/kg)									
Aroclor 1016	0.117 U	0.552 U	0.105 U	0.528 U	5.19 U	0.108 U	0.0993 U	na	na
Aroclor 1221	0.117 U	0.552 U	0.105 U	0.528 U	5.19 U	0.108 U	0.0993 U	na	na
Aroclor 1232	0.117 U	0.552 U	0.105 U	0.528 U	5.19 U	0.108 U	0.0993 U	na	na
Aroclor 1242	0.117 U	0.552 U	0.105 U	0.528 U	5.19 U	0.108 U	0.0993 U	na	na
Aroclor 1248	0.117 U	0.552 U	0.105 U	0.528 U	5.19 U	0.108 U	0.0993 U	na	na
Aroclor 1254	0.117 U	**8.85 J**	**0.384**	**4.42 J**	**145**	**0.159**	**2.13**	na	na
Aroclor 1260	0.117 U	0.552 U	0.105 U	0.528 U	5.19 U	0.108 U	0.0993 U	na	na
Total PCBs	0.819 U	***8.85 J***	**0.384**	***4.42 J***	***145***	**0.159**	***2.13***	1.2	7.5

Table 4-5

SUMMARY OF SOIL PCB RESULTS - ANALYTICAL LABORATORY
BURNS ASBESTOS REMOVAL ACTION
HARNEY, OREGON

EPA Sample ID	**04100005**	**04100006**	**04100007**	**04100008**	**04100009**	**ODEQ PCB Remedy Residential Soil PRGs**	**ODEQ PCB Remedy Industrial Soil PRGs**
Station ID	**SS-57**	**SS-58**	**SS-59**	**SS-60**	**SS-61**		
Sample Depth (feet bgs)	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**		
Description	**Building 200 after final excavation**	**Building 200 after final excavation**	**Building 200 after final excavation**	**Building 200 after final excavation**	**Building 200 after final excavation**		
PCBs (mg/kg)							
Aroclor 1016	0.105 U	0.102 U	0.104 U	0.100 U	0.102 U	na	na
Aroclor 1221	0.105 U	0.102 U	0.104 U	0.100 U	0.102 U	na	na
Aroclor 1232	0.105 U	0.102 U	0.104 U	0.100 U	0.102 U	na	na
Aroclor 1242	0.105 UJ	0.102 UJ	0.104 UJ	0.100 UJ	0.102 UJ	na	na
Aroclor 1248	0.105 U	0.102 U	0.104 U	0.100 U	0.102 U	na	na
Aroclor 1254	**0.81**	**0.245**	**2.4**	**1.48 J**	**0.218**	na	na
Aroclor 1260	0.105 U	0.102 U	0.104 U	0.100 U	0.102 U	na	na
Total PCBs	**0.81**	**0.245**	***2.4***	***1.48 J***	**0.218**	1.2	7.5

Table 4-5

SUMMARY OF SOIL PCB RESULTS - ANALYTICAL LABORATORY
BURNS ASBESTOS REMOVAL ACTION
HARNEY, OREGON

EPA Sample ID	**04100010**	**04100012**	**04100013**	**04100014**	**04100015**	**ODEQ PCB Remedy Residential Soil PRGs**	**ODEQ PCB Remedy Industrial Soil PRGs**
Station ID	**SS-62**	**SS-64**	**SS-65**	**SS-66**	**SS-67**		
Sample Depth (feet bgs)	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**		
Description	**Building 200 after final excavation**	**Building 200 after final excavation**	**Building 200 after final excavation**	**Building 200 after final excavation**	**Building 200 after final excavation (under SS-63)**		
PCBs (mg/kg)							
Aroclor 1016	0.100 U	0.100 U	0.111 U	0.101 U	0.101 U	na	na
Aroclor 1221	0.100 U	0.100 U	0.111 U	0.101 U	0.101 U	na	na
Aroclor 1232	0.100 U	0.100 U	0.111 U	0.101 U	0.101 U	na	na
Aroclor 1242	0.100 UJ	0.100 UJ	0.111 UJ	0.101 UJ	0.101 UJ	na	na
Aroclor 1248	0.100 U	0.100 U	0.111 U	0.101 U	0.101 U	na	na
Aroclor 1254	**2.74 J**	**0.494**	**0.246**	**2.94**	**0.0672 J**	na	na
Aroclor 1260	0.100 U	0.100 U	0.111 U	0.101 U	0.101 U	na	na
Total PCBs	***2.74 J***	**0.494**	**0.246**	***2.94***	**0.0672 J**	1.2	7.5

Notes: Bold type indicates sample concentration is greater than the detection limit.
Italic underline font indicates that the total PCB result exceeds the listed PRG (Residential).

Key:
bgs = below ground surface
EPA = Environmental Protection Agency
ID = identification
J = The result is an estimated quantity.
mg/kg = milligrams per kilogram
na = not applicable
ODEQ = Oregon Department of Environmental Quality
PCB = polychlorinated biphenyl
PRG = preliminary remediation goal
SS = surface soil sample
U = The associated numerical value is the sample quantitation limit.

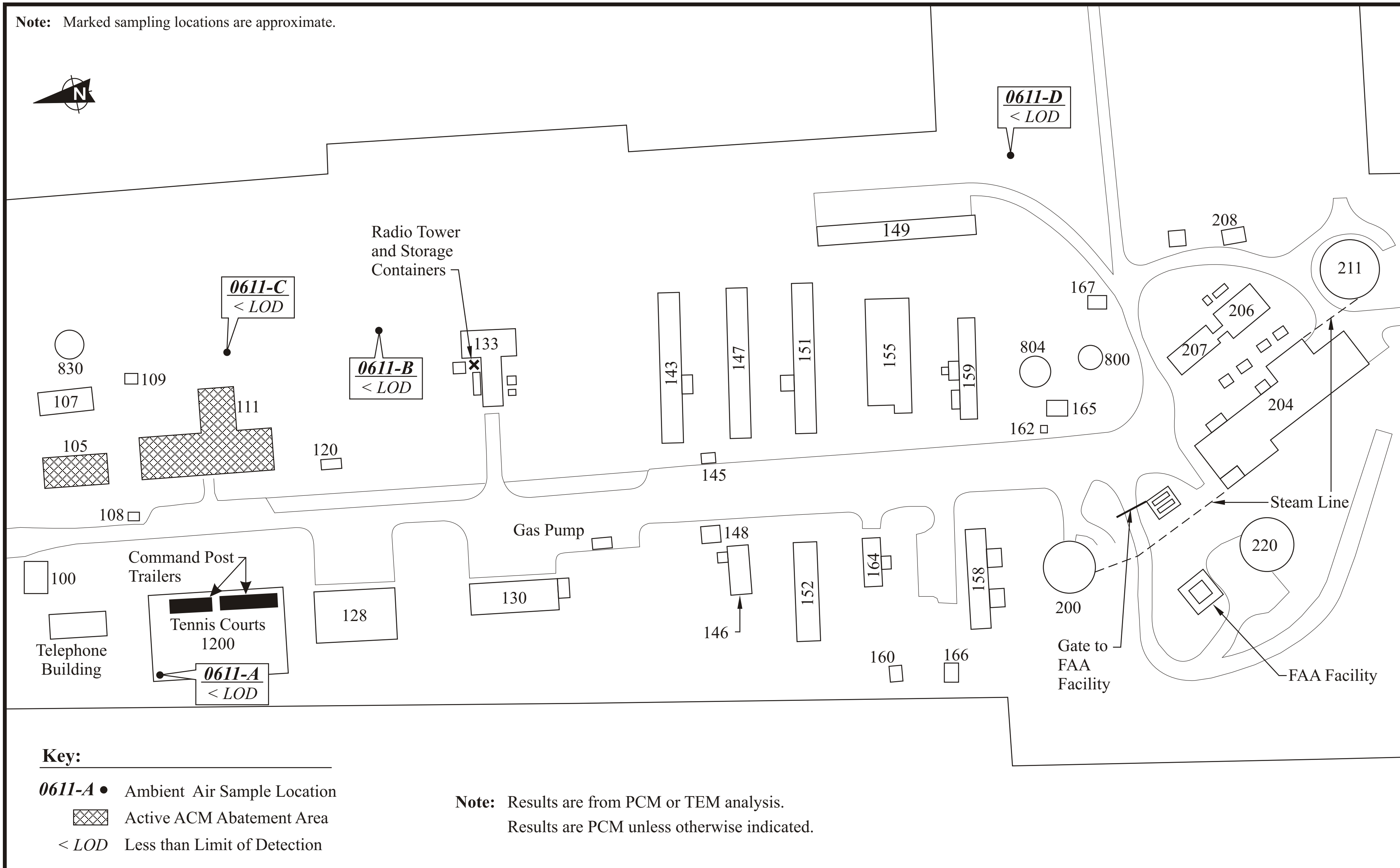
Table 4-6

SUMMARY OF WIPE PCB RESULTS
BURNS ASBESTOS REMOVAL ACTION
HARNEY COUNTY, OREGON

Station ID	EPA Sample ID	Sample Date	Location	Description	Ensys PCB Field Test Kit (Aroclor 1260 Standard)
TSCA Standard for Surfaces					**10 µg / 100 cm^2**
WI-01	04060651	6/19/2004	Building 200 - Lower Level	Top of lower level I-beam	**≥ 5 µg / 100 cm^2**
WI-02	04060652	6/19/2004	Building 200 - Lower Level	Top of lower level I-beam	**≥ 5 µg / 100 cm^2**
WI-03	04060653	6/19/2004	Building 200 - Lower Level	Top of steel floor panel, lower level	**≥ 5 µg / 100 cm^2**
WI-04	04060654	6/19/2004	Building 200 - Lower Level	Vertical face of lower level I-beam	< 5 µg / 100 cm^2
WI-05	04060655	6/19/2004	Building 200 - Lower Level	Inside surface of transformer shell	< 5 µg / 100 cm^2
WI-06	04060656	6/23/2004	Building 200 - Lower Level	Same location as WI-02, after decon with "Simple Green"	**≥ 5 µg / 100 cm^2**
WI-07	04060657	6/23/2004	Building 200 - Lower Level	Close to WI-03, after decon with "Simple Green"	< 5 µg / 100 cm^2
WI-08	04060658	6/23/2004	Building 200 - Lower Level	Inside exterior wall on lower level	< 5 µg / 100 cm^2
WI-09	04060659	6/23/2004	Building 200 - Lower Level	Inside exterior wall on lower level	< 5 µg / 100 cm^2
WI-10	04060660	6/23/2004	Building 200 - Lower Level	Vertical face of lower level I-beam	< 5 µg / 100 cm^2
WI-11	04060661	6/23/2004	Building 200 - Lower Level	Vertical face of lower level I-beam	< 5 µg / 100 cm^2
WI-12	04060662	6/24/2004	Building 200 - Upper Level	Top of steel floor panel, northwest of containment area	< 10 µg / 100 cm^2
WI-13	04060663	6/24/2004	Building 200 - Upper Level	Top of steel floor panel, southwest of containment area	< 10 µg / 100 cm^2
WI-14	04060664	6/24/2004	Building 200 - Upper Level	Top of steel floor panel, west side	< 10 µg / 100 cm^2
WI-15	04060665	6/24/2004	Building 200 - Upper Level	Top of steel floor panel, east side	< 10 µg / 100 cm^2
WI-16	04060666	6/24/2004	Building 200 - Upper Level	Vertical face of upper level I-beam, near containment area	< 10 µg / 100 cm^2
WI-17	04060667	6/24/2004	Building 200 - Upper Level	Top of steel floor panel, north side	< 10 µg / 100 cm^2
WI-18	04060668	6/24/2004	Building 200 - Lower Level	Sample not collected - sterile gauze pad dropped	Not analyzed
WI-19	04060669	6/24/2004	Building 200 - Lower Level	Lower level beam on east side	**≥ 10 µg / 100 cm^2**
WI-20	04060670	6/24/2004	Building 200 - Lower Level	Lower level beam on southeast side	**≥ 10 µg / 100 cm^2**
WI-21	04060671	6/24/2004	Building 200 - Lower Level	Lower level beam on north center	**≥ 10 µg / 100 cm^2**
WI-22	04060672	6/24/2004	Building 200 - Lower Level	Lower level beam in center	**≥ 10 µg / 100 cm^2**
WI-23	04060673	6/25/2004	Building 200 - Lower Level	Top of steel floor panel, lower level	**≥ 10 µg / 100 cm^2**
WI-24	04060674	6/25/2004	Building 200 - Lower Level	Lower level beam near WI-21	**≥ 10 µg / 100 cm^2**
WI-25	04060675	6/25/2004	Building 200 - Lower Level	Lower level beam in south-southwest	**≥ 10 µg / 100 cm^2**
WI-26	04060676	6/25/2004	Building 200 - Lower Level	Top of steel floor panel at southwest	**≥ 10 µg / 100 cm^2**
WI-27	04060677	6/25/2004	Building 200 - Lower Level	Top of steel floor panel at north-northwest	< 10 µg / 100 cm^2
WI-28	04100051	10/12/2004	Building 200 - Excavation	Inside excavator bucket after decontamination	< 10 µg / 100 cm^2
WI-29	04100052	10/12/2004	Building 200 - Excavation	Outside excavator bucket after decontamination	< 10 µg / 100 cm^2

Notes: Results in bold typeface indicate a positive result.

Key:
EPA = Environmental Protection Agency
ID = identification number
µg / 100 cm^2 = micrograms per 100 square-centimeters
PCB = polychlorinated biphenyl
ppm = parts per million
WI = wipe sample



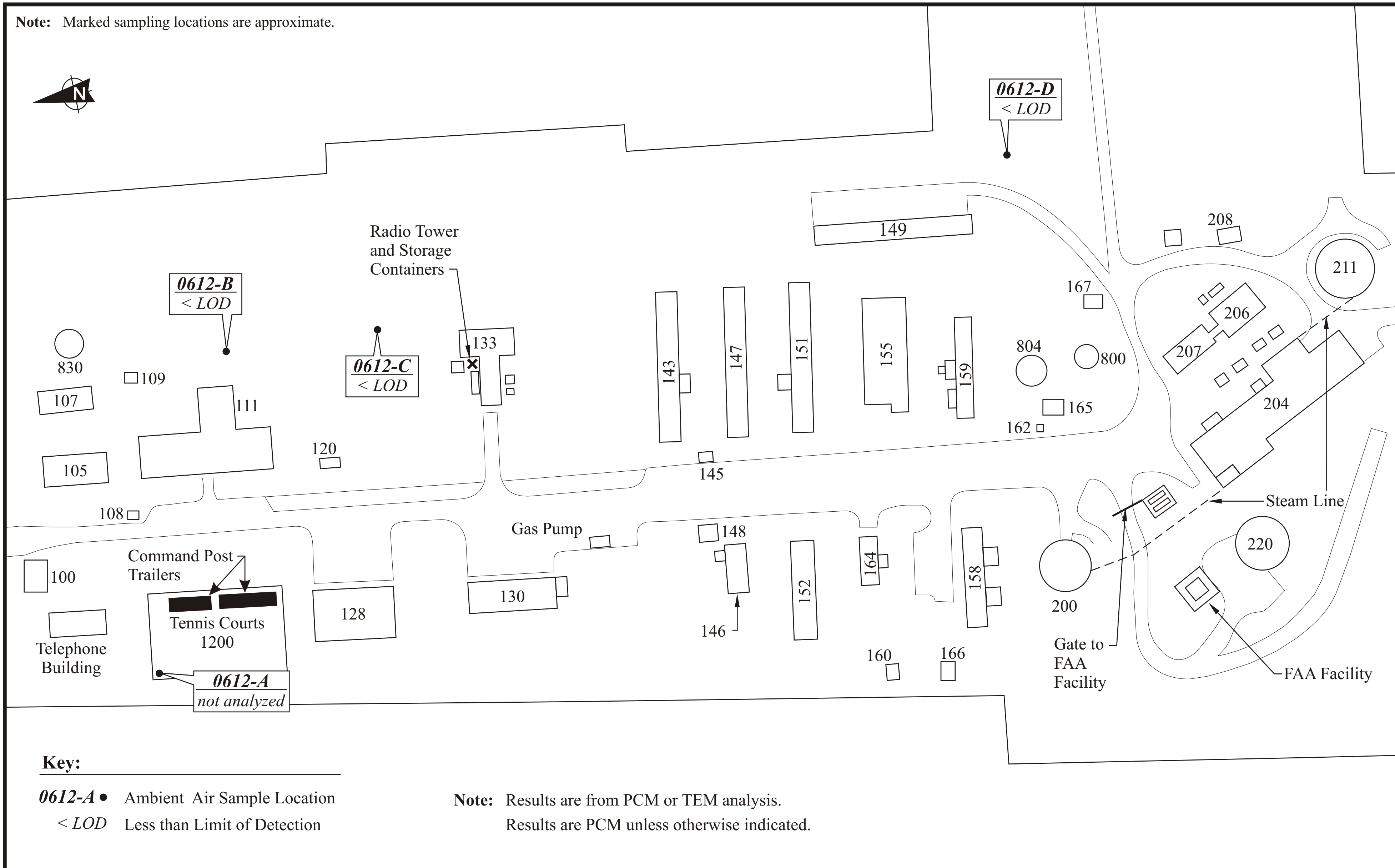
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-1
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 11, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs



ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

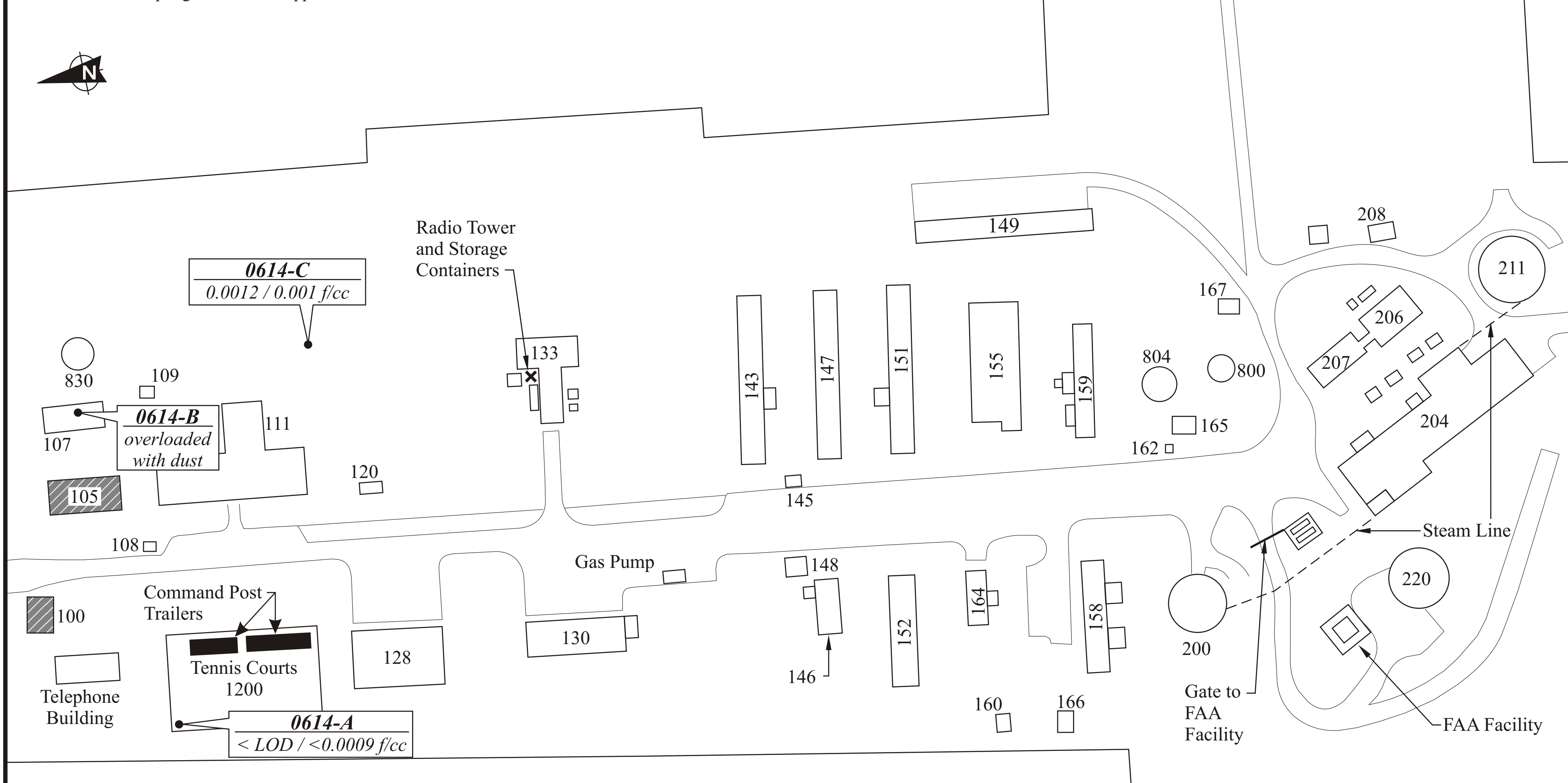
BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-2
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 12, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs

Note: Marked sampling locations are approximate.



Key:

0614-A ●	Ambient Air Sample Location	*f/cc*	fibers per cubic centimeter of air (PCM)
(hatched box)	Active Demolition, Sizing, or Loading Area	*PCM*	Phase Contrast Microscope
< LOD	Less than Limit of Detection		

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

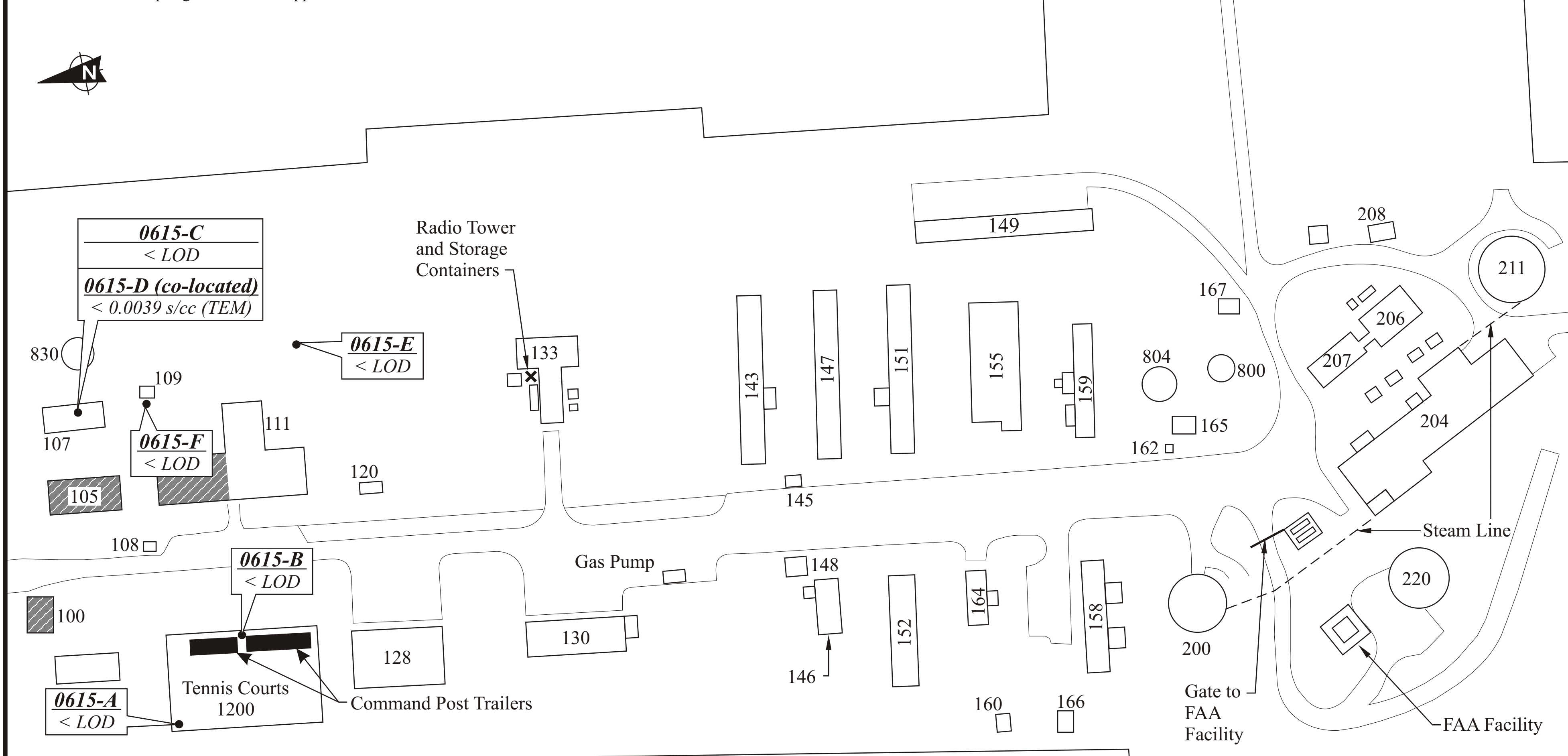
BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-3
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 14, 2004)

Date: 12/29/04 | Drawn by: AES | 10:START-2\04060001\Section 4 figs

Note: Marked sampling locations are approximate.



Key:

0615-A ●	Ambient Air Sample Location
(hatched area)	Active Demolition, Sizing, or Loading Area
< LOD	Less than Limit of Detection
s/cc	structures per cubic centimeters of air (TEM)
TEM	Transmission Election Microscope

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

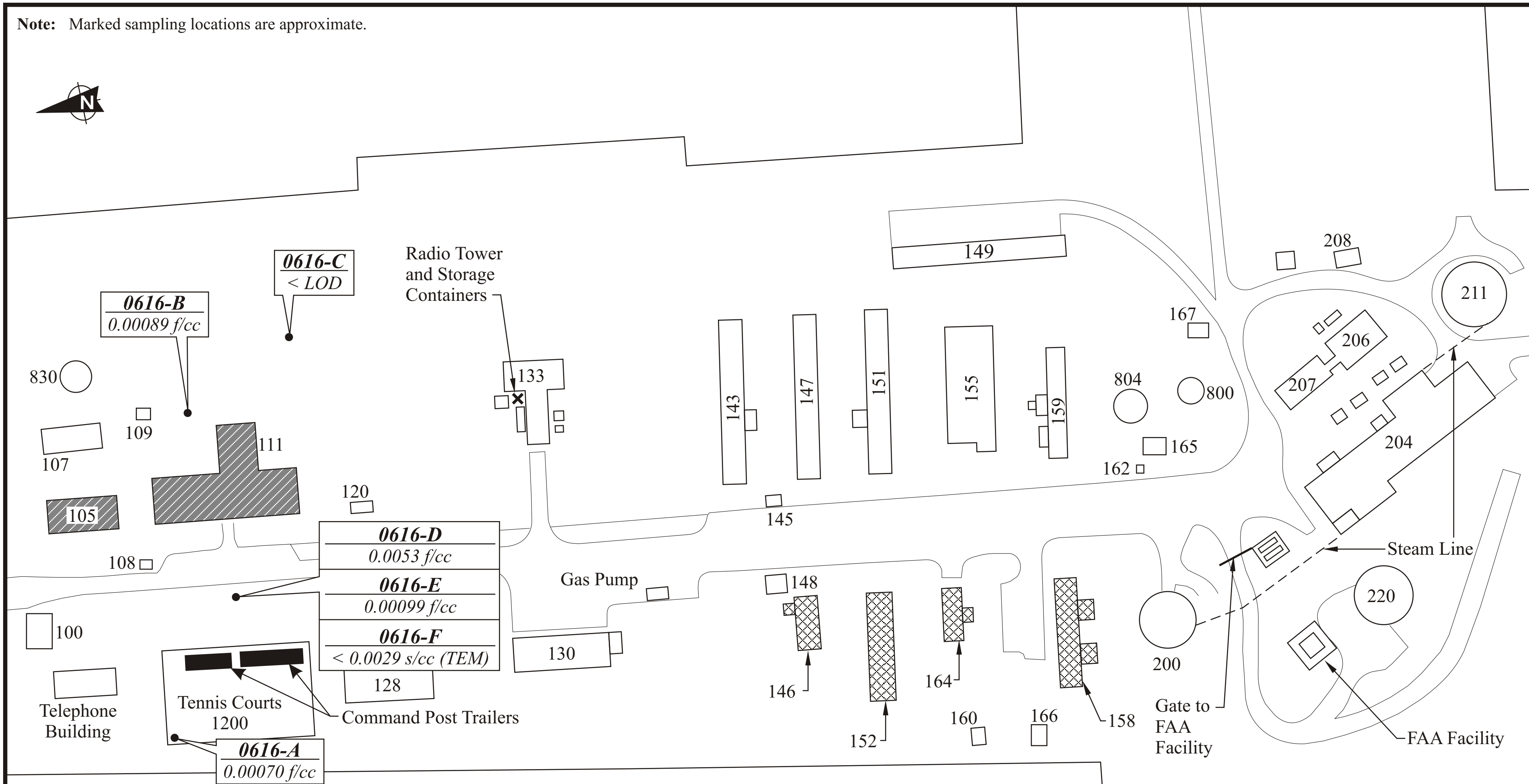
BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-4
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 15, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs

Note: Marked sampling locations are approximate.



Key:

0616-A ●	Ambient Air Sample Location	*f/cc*	fibers per cubic centimeter of air (PCM)
(hatched)	Active Demolition, Sizing, or Loading Area	*s/cc*	structures per cubic centimeters of air (TEM)
(cross-hatched)	Active ACM Abatement Area	*PCM*	Phase Contrast Microscope
< LOD	Less than Limit of Detection	*TEM*	Transmission Election Microscope

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

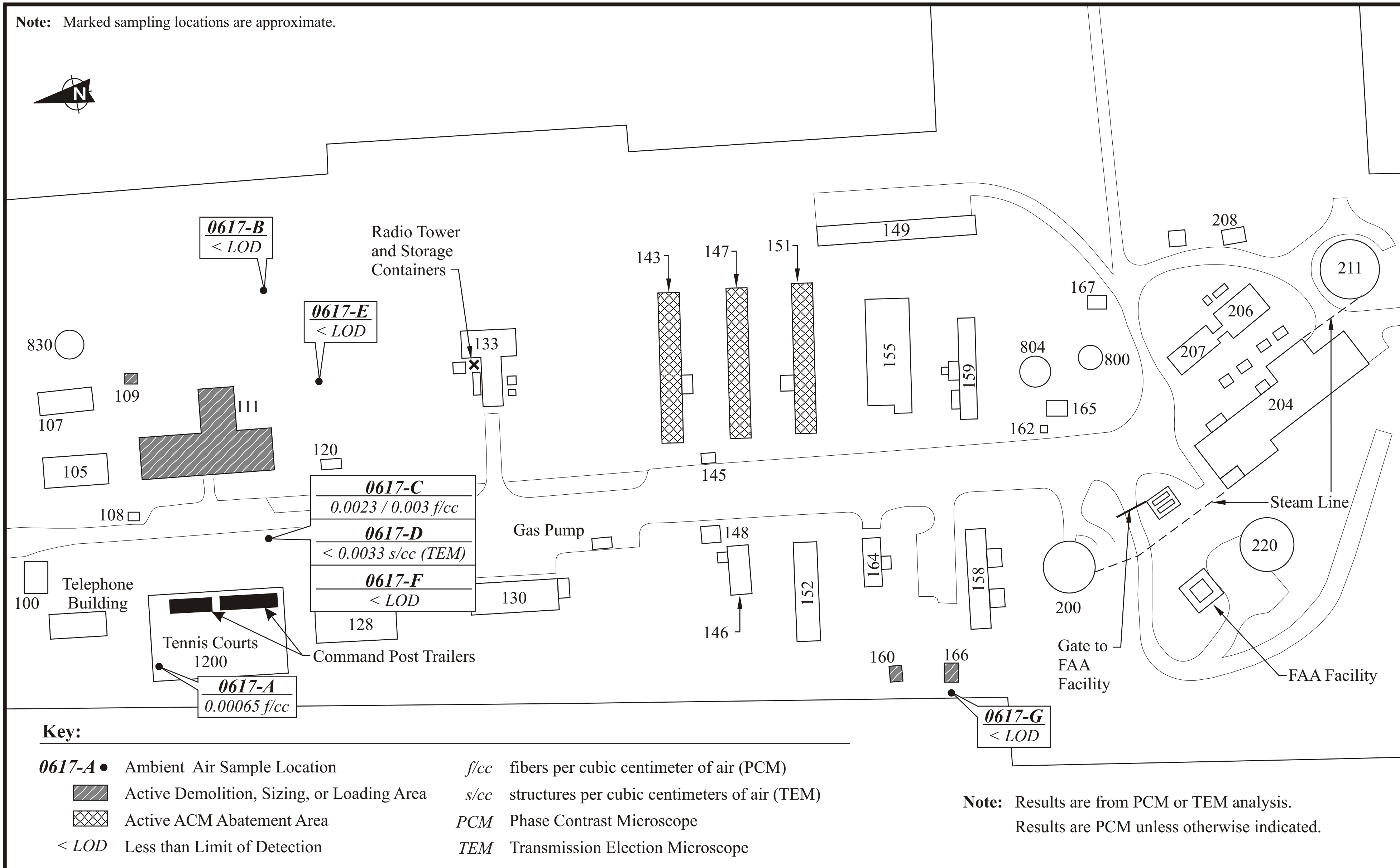
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-5
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 16, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs



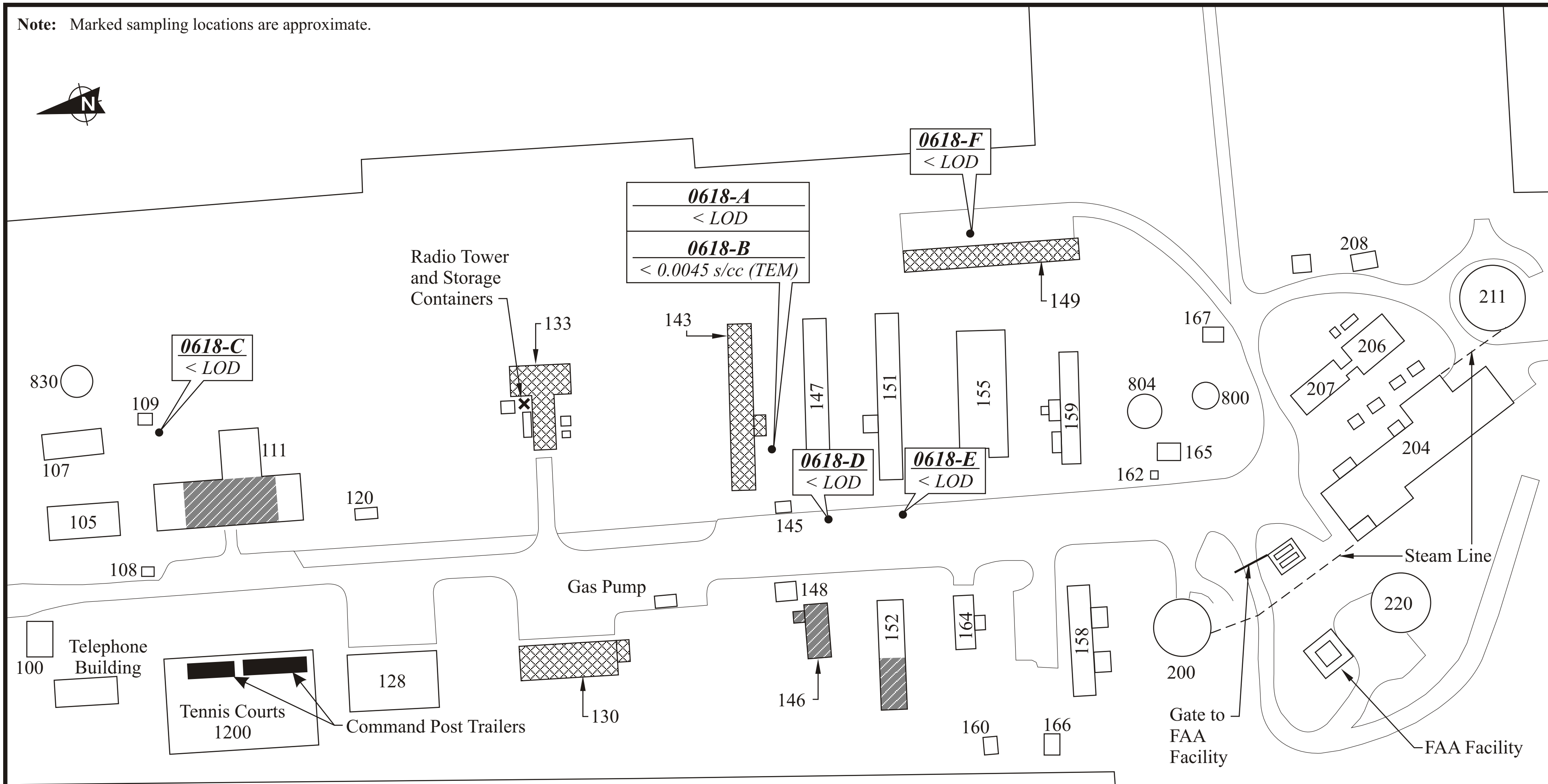
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-6
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 17, 2004)

Date: 12/29/04
Drawn by: AES
10:START-2\04060001\Section 4 figs



Key:

0618-A ●	Ambient Air Sample Location	*< LOD*	Less than Limit of Detection
(hatched)	Active Demolition, Sizing, or Loading Area	*s/cc*	structures per cubic centimeters of air (TEM)
(cross-hatched)	Active ACM Abatement Area	*TEM*	Transmission Election Microscope

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

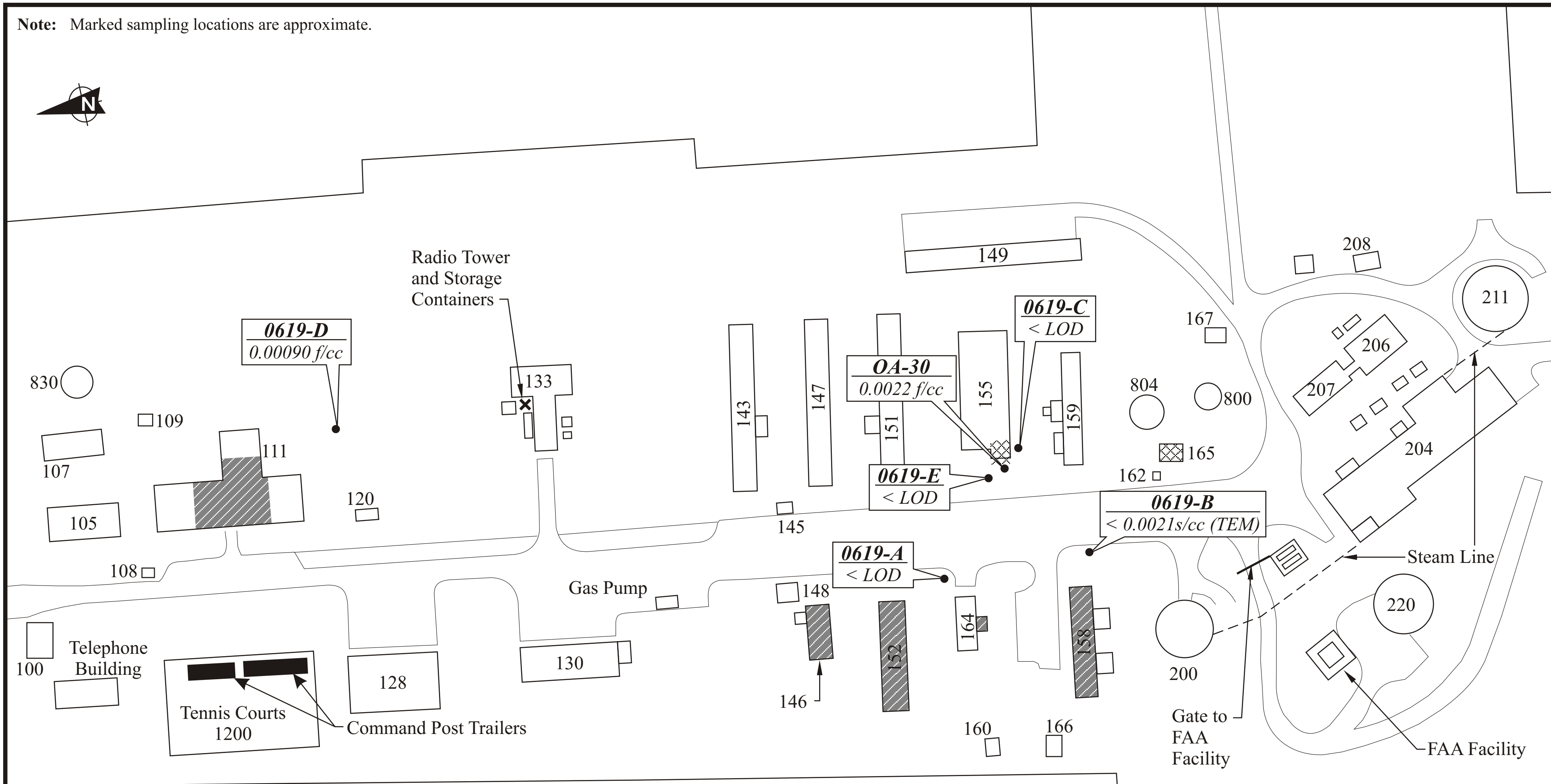
BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-7
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 18, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs

Note: Marked sampling locations are approximate.



Key:

0619-A •	Ambient Air Sample Location	*f/cc*	fibers per cubic centimeter of air (PCM)
(hatched)	Active Demolition, Sizing, or Loading Area	*s/cc*	structures per cubic centimeters of air (TEM)
(cross-hatched)	Active ACM Abatement Area	*PCM*	Phase Contrast Microscope
< LOD	Less than Limit of Detection	*TEM*	Transmission Election Microscope

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

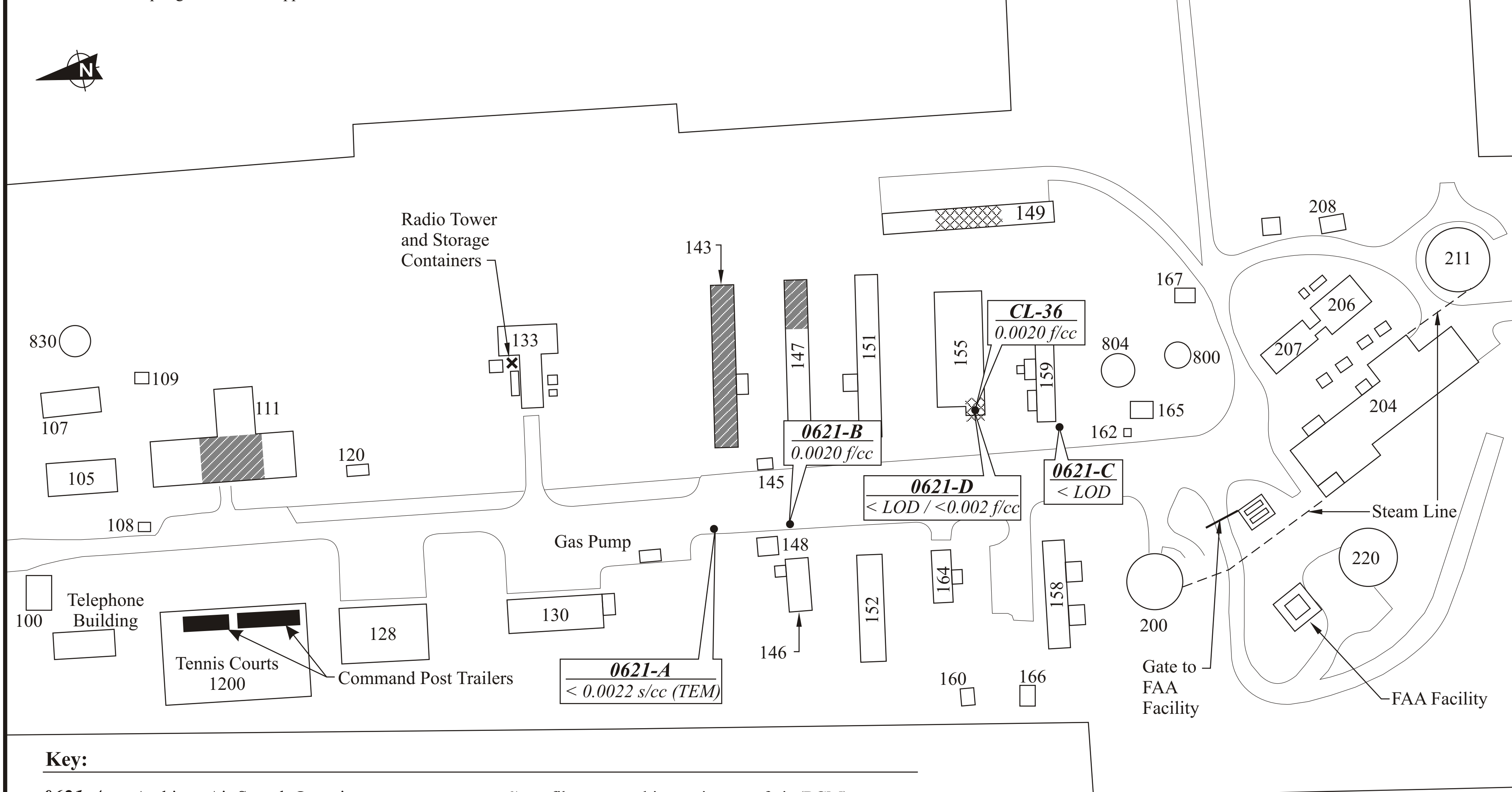
BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-8
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 19, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs

Note: Marked sampling locations are approximate.



Key:

0621-A ●	Ambient Air Sample Location	*f/cc*	fibers per cubic centimeter of air (PCM)
(hatched)	Active Demolition, Sizing, or Loading Area	*s/cc*	structures per cubic centimeters of air (TEM)
(cross-hatched)	Active ACM Abatement Area	*PCM*	Phase Contrast Microscope
< LOD	Less than Limit of Detection	*TEM*	Transmission Election Microscope

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

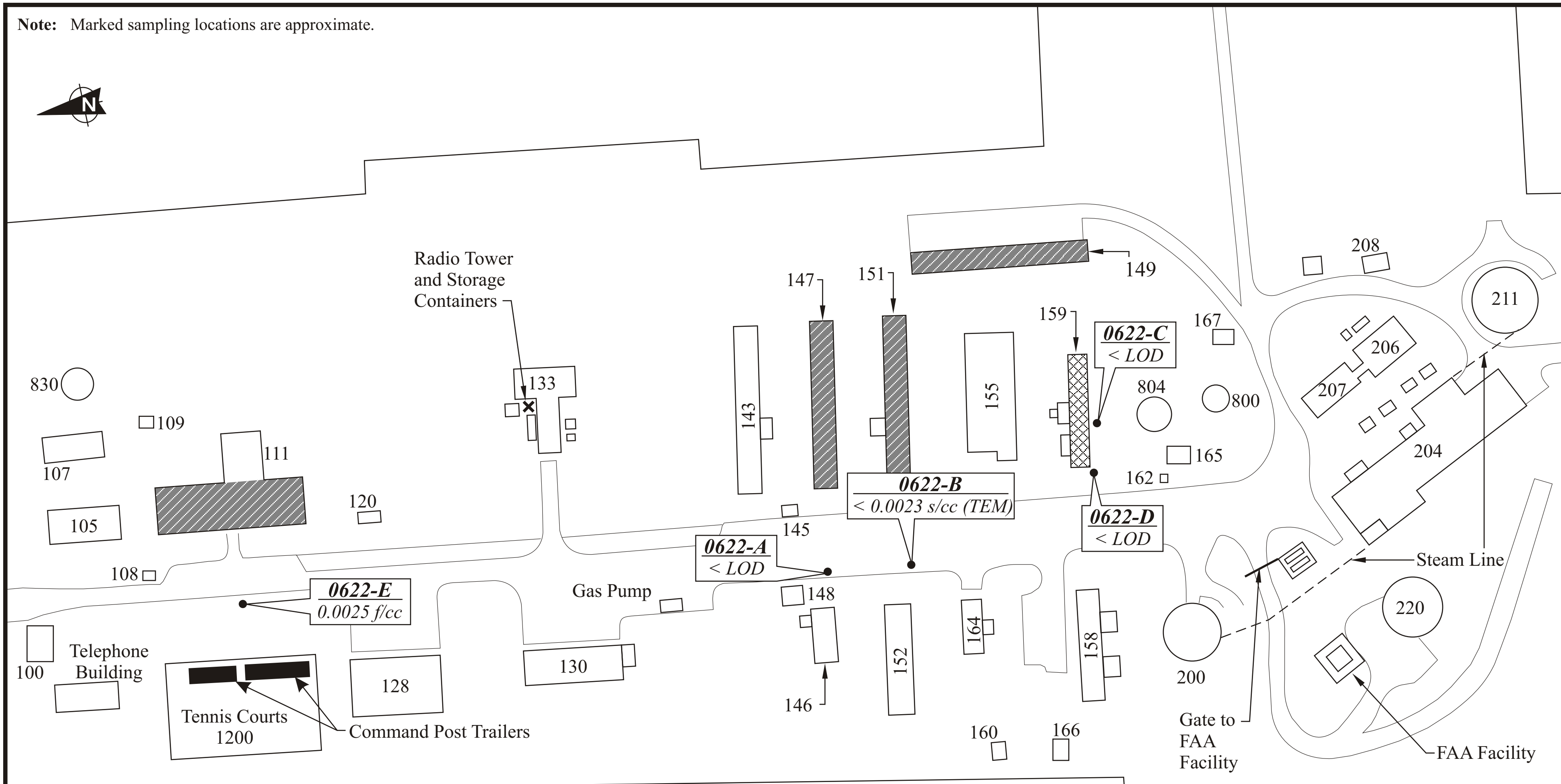
BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-9
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 21, 2004)

Date: 12/29/04 | Drawn by: AES | 10:START-2\04060001\Section 4 figs

Note: Marked sampling locations are approximate.



Key:

0622-A ●	Ambient Air Sample Location	*f/cc*	fibers per cubic centimeter of air (PCM)
(hatched)	Active Demolition, Sizing, or Loading Area	*s/cc*	structures per cubic centimeters of air (TEM)
(cross-hatched)	Active ACM Abatement Area	*PCM*	Phase Contrast Microscope
< LOD	Less than Limit of Detection	*TEM*	Transmission Election Microscope

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

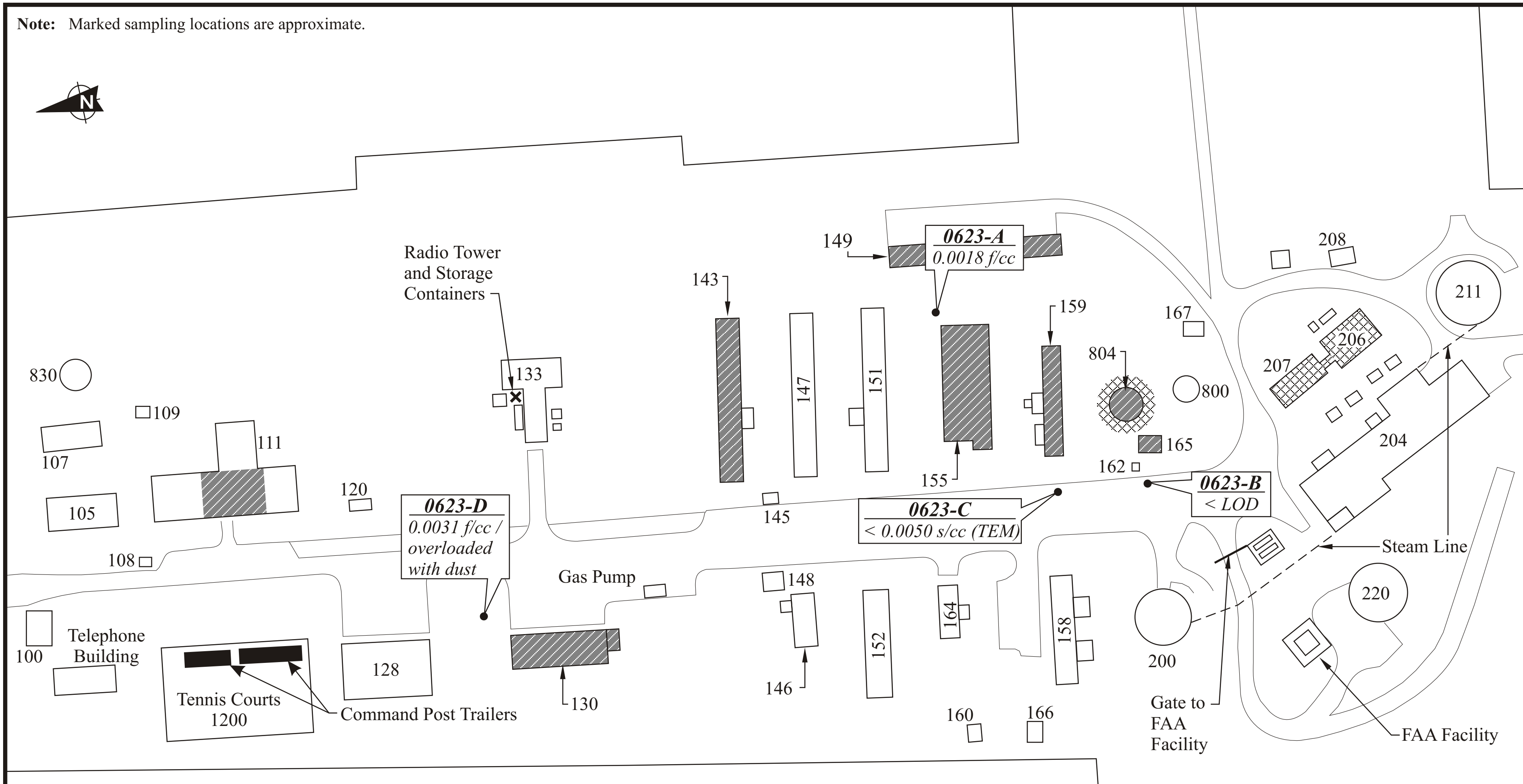
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-10
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 22, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs



Key:

0623-A ●	Ambient Air Sample Location
(hatched)	Active Demolition, Sizing, or Loading Area
(cross-hatched)	Active ACM Abatement Area
< LOD	Less than Limit of Detection
f/cc	fibers per cubic centimeter of air (PCM)
s/cc	structures per cubic centimeters of air (TEM)
PCM	Phase Contrast Microscope
TEM	Transmission Election Microscope

Note: Results are from PCM or TEM analysis. Results are PCM unless otherwise indicated.

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

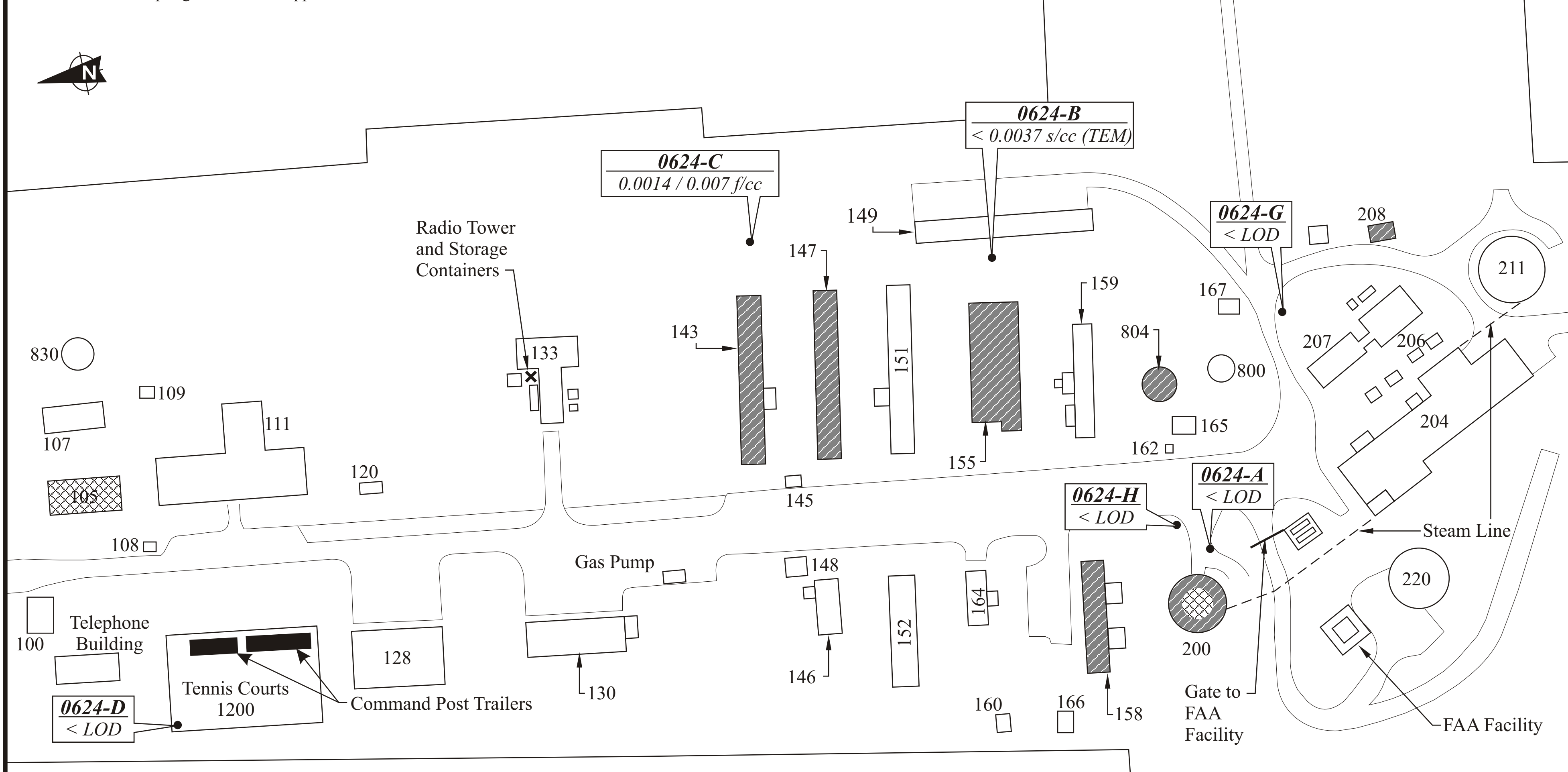
BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-11
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 23, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs

Note: Marked sampling locations are approximate.



Key:

0624-A •	Ambient Air Sample Location	*f/cc*	fibers per cubic centimeter of air (PCM)
(hatched)	Active Demolition, Sizing, or Loading Area	*s/cc*	structures per cubic centimeters of air (TEM)
(cross-hatched)	Active ACM Abatement Area	*PCM*	Phase Contrast Microscope
< LOD	Less than Limit of Detection	*TEM*	Transmission Election Microscope

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

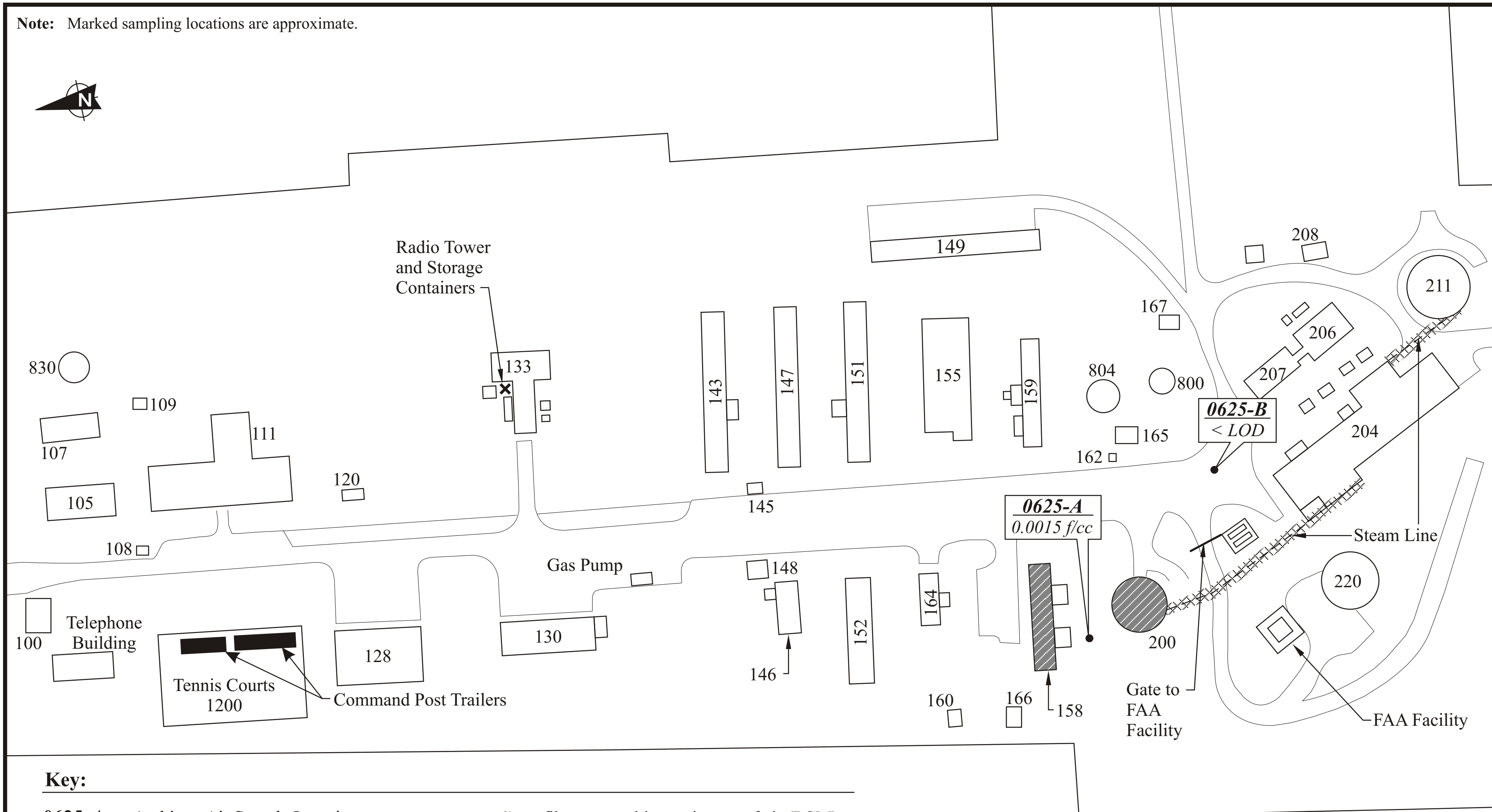
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-12
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 24, 2004)

Date: 12/29/04 | Drawn by: AES | 10:START-2\04060001\Section 4 figs



Key:

0625-A ●	Ambient Air Sample Location
(hatched)	Active Demolition, Sizing, or Loading Area
(cross-hatched)	Active ACM Abatement Area
< LOD	Less than Limit of Detection
f/cc	fibers per cubic centimeter of air (PCM)
PCM	Phase Contrast Microscope

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

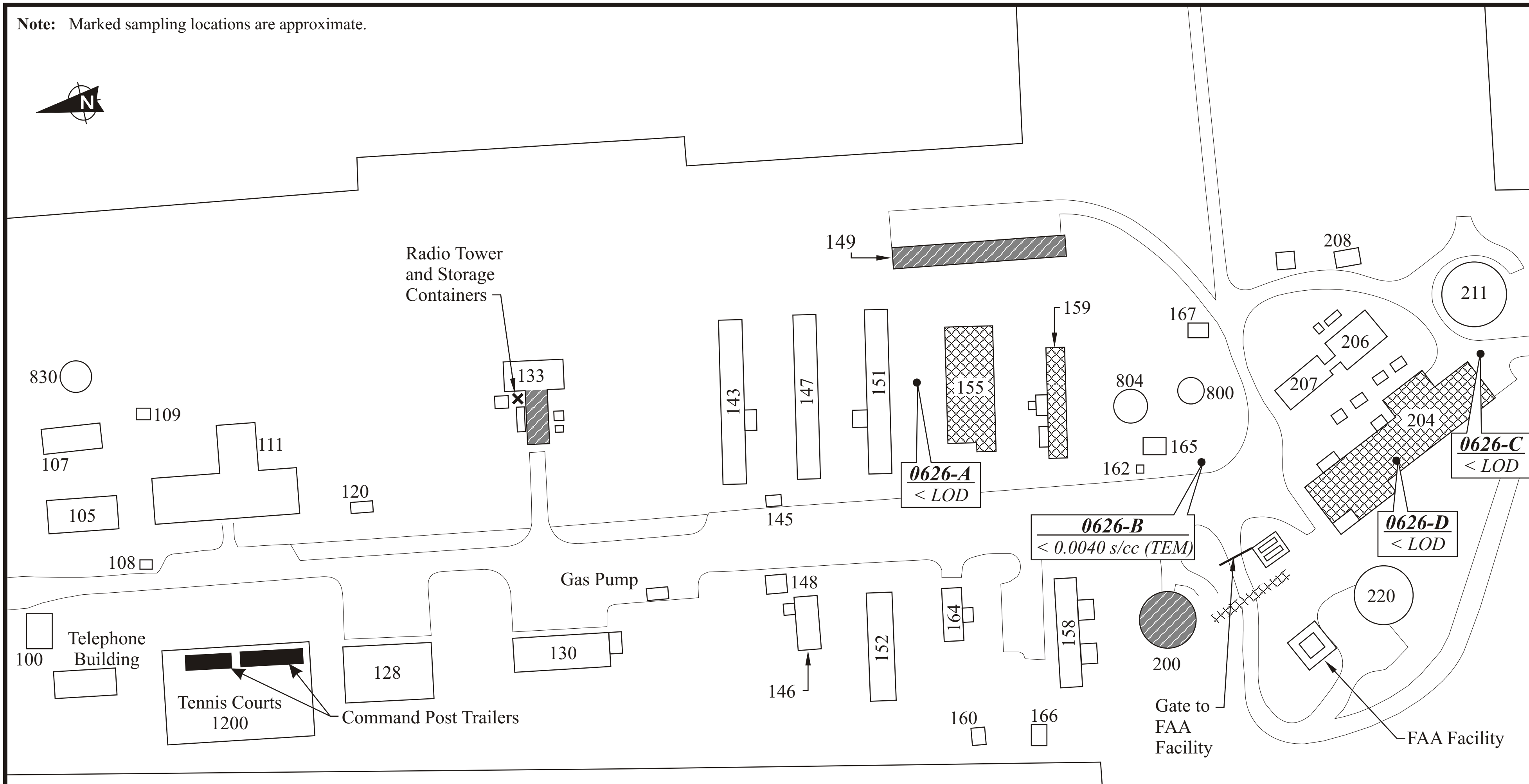
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-13
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 25, 2004)

Date: 12/29/04 | Drawn by: AES | 10:START-2\04060001\Section 4 figs



Key:

0626-A •	Ambient Air Sample Location	*s/cc*	structures per cubic centimeters of air (TEM)
(diagonal hatch)	Active Demolition, Sizing, or Loading Area	*TEM*	Transmission Election Microscope
(cross hatch)	Active ACM Abatement Area		
< LOD	Less than Limit of Detection		

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

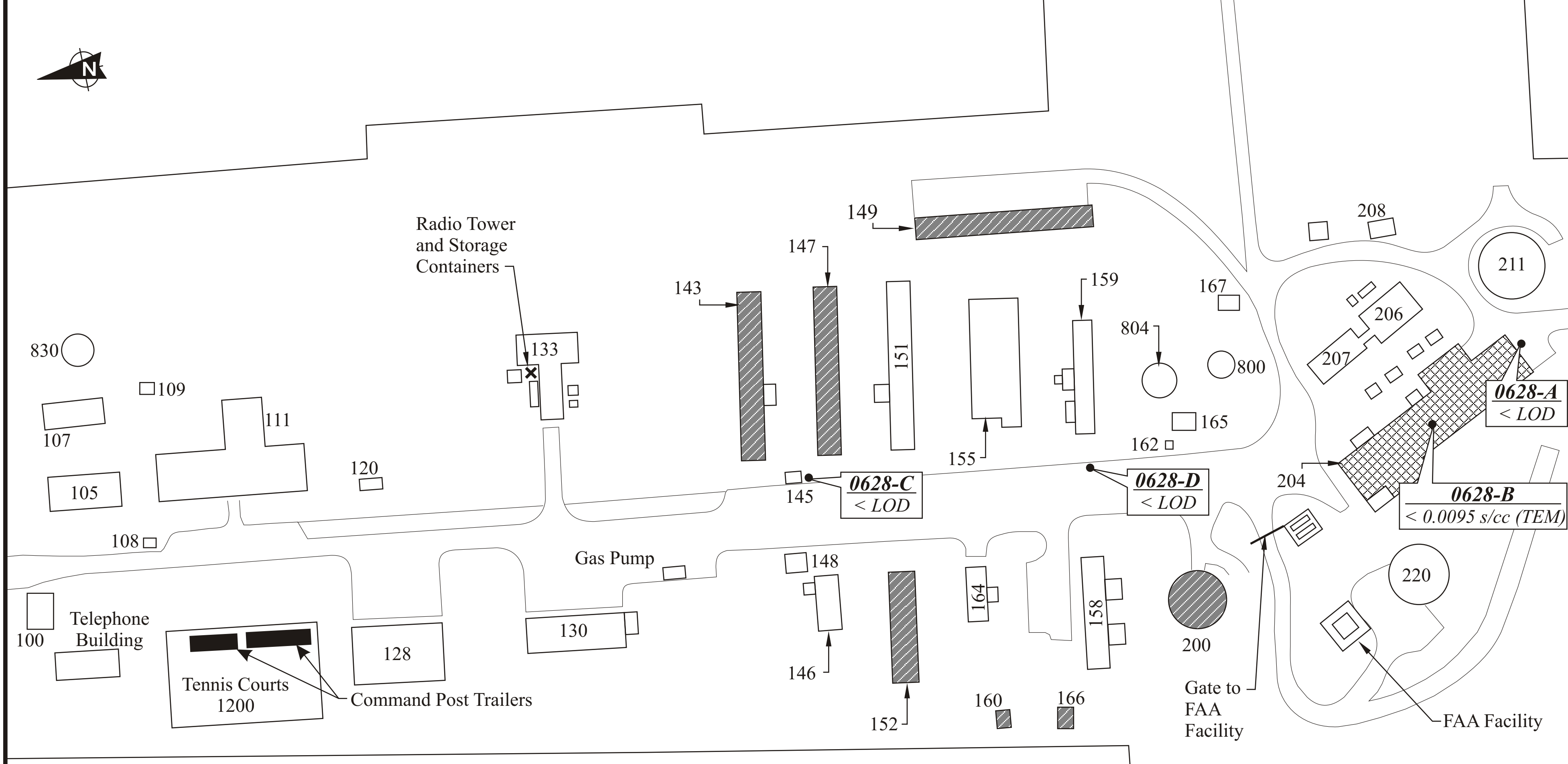
BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-14
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 26, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs

Note: Marked sampling locations are approximate.



Key:

0628-A •	Ambient Air Sample Location	*s/cc*	structures per cubic centimeters of air (TEM)
(hatched)	Active Demolition, Sizing, or Loading Area	*TEM*	Transmission Election Microscope
(cross-hatched)	Active ACM Abatement Area		
< LOD	Less than Limit of Detection		

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

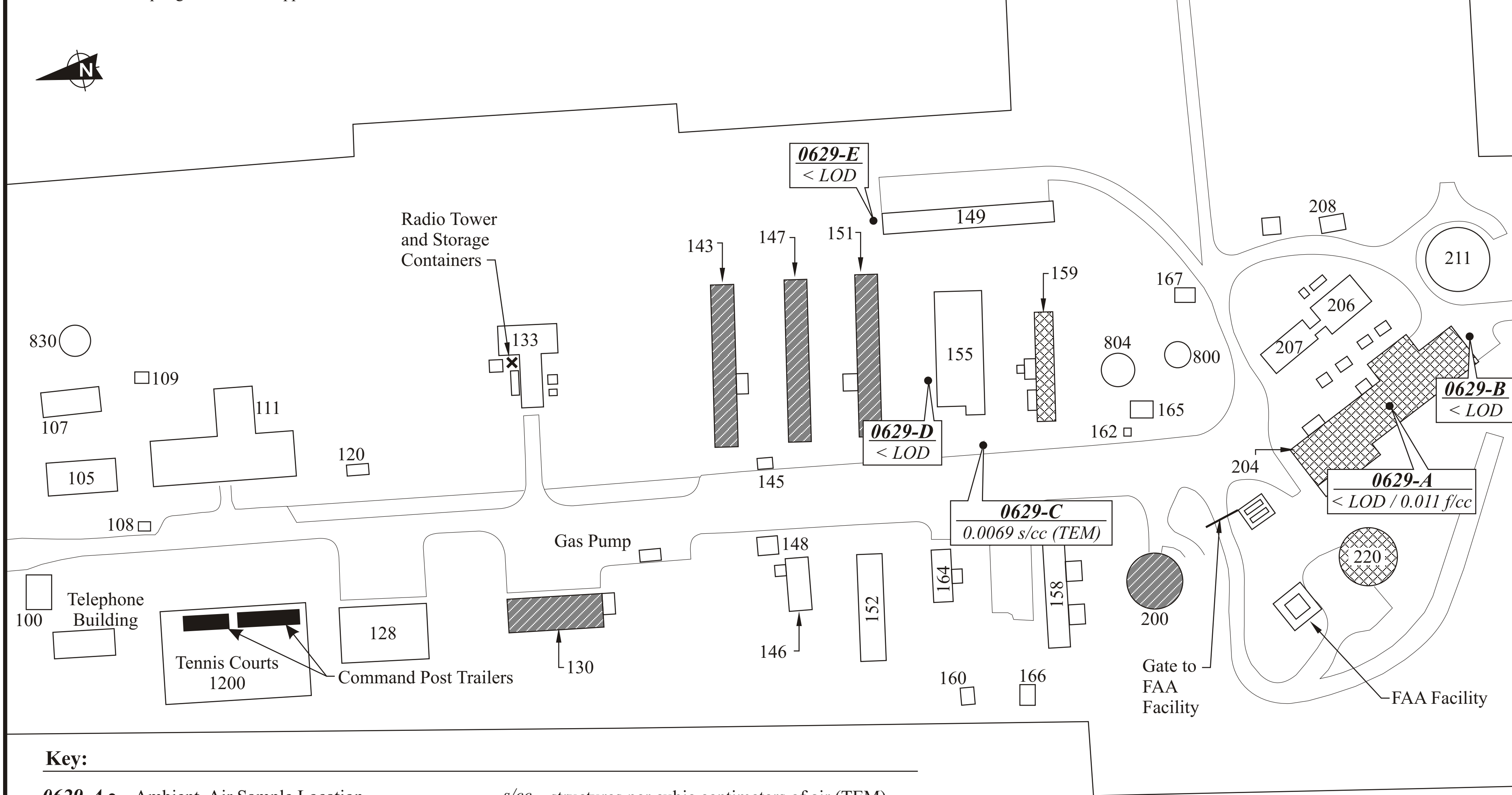
BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-15
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 28, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs

Note: Marked sampling locations are approximate.



Key:

0629-A ●	Ambient Air Sample Location	*s/cc*	structures per cubic centimeters of air (TEM)
(diagonal hatch)	Active Demolition, Sizing, or Loading Area	*TEM*	Transmission Election Microscope
(cross hatch)	Active ACM Abatement Area		
< LOD	Less than Limit of Detection		

Note: Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

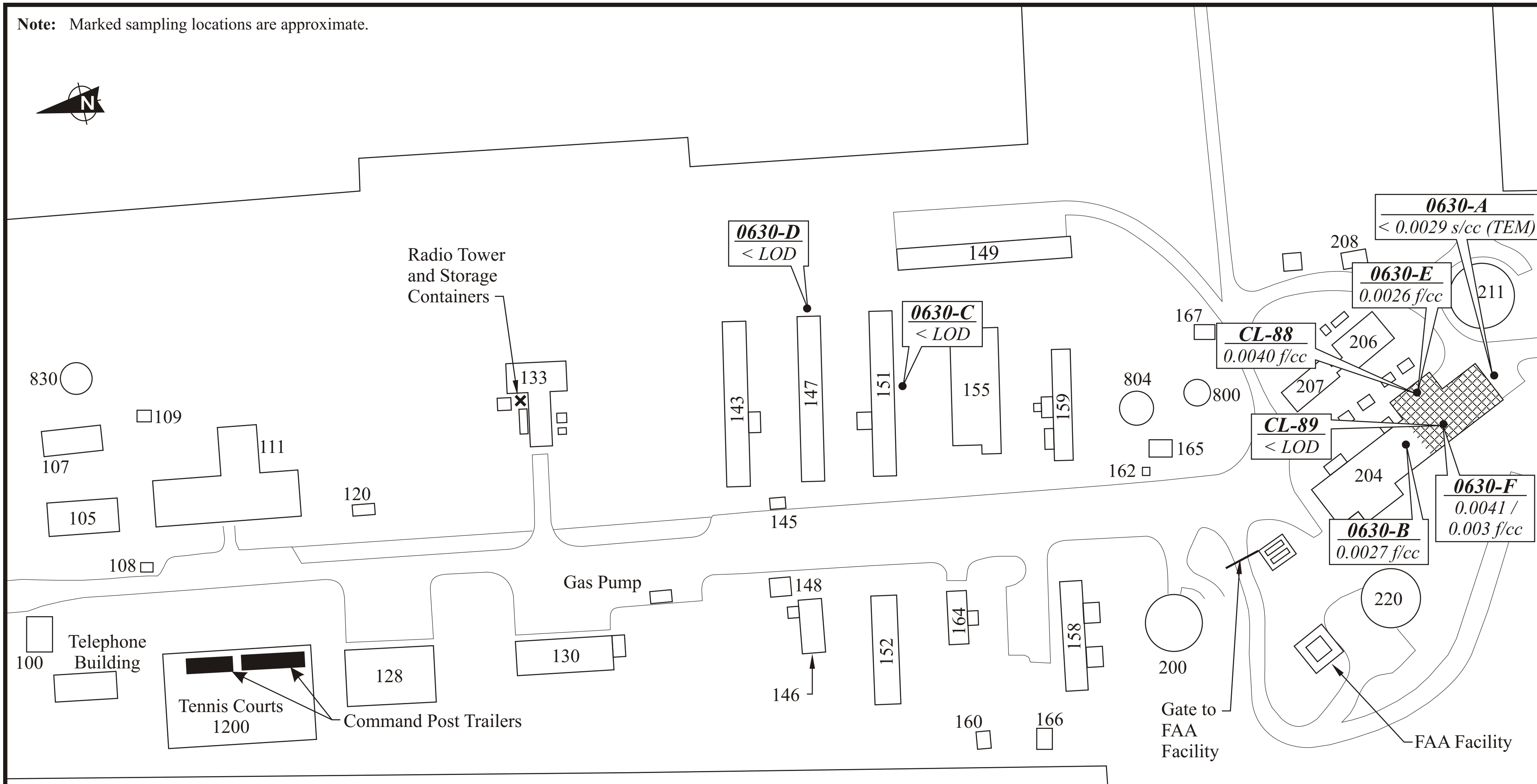
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-16
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 29, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs



Key:

0630-A ●	Ambient Air Sample Location	*f/cc*	fibers per cubic centimeter of air (PCM)
(hatched box)	Active ACM Abatement Area	*s/cc*	structures per cubic centimeters of air (TEM)
< LOD	Less than Limit of Detection	*PCM*	Phase Contrast Microscope
		TEM	Transmission Election Microscope

Note: General site-wide cleanup.
Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

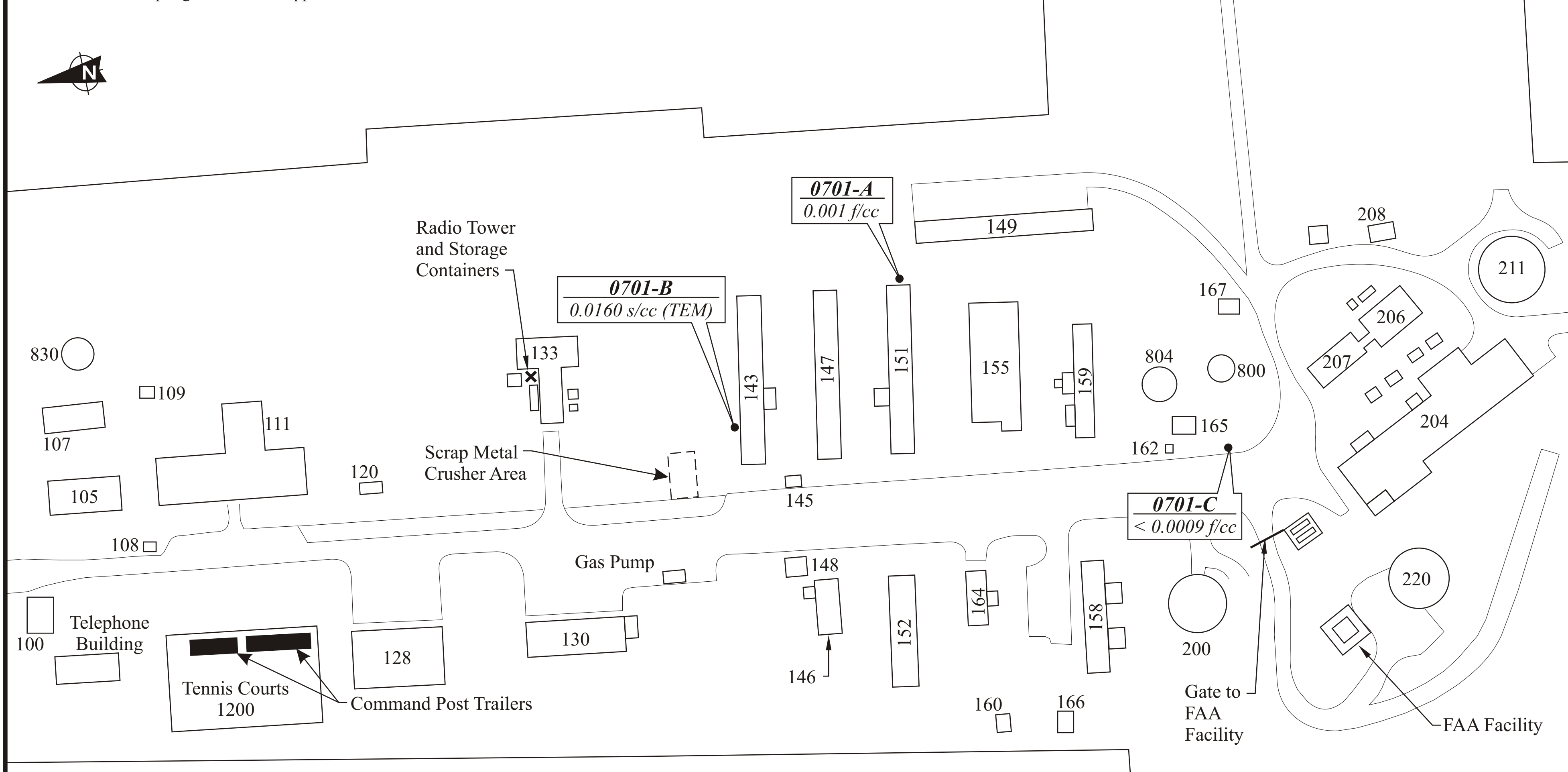
BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-17
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (June 30, 2004)

Date: 12/29/04
Drawn by: AES
10:START-2\04060001\Section 4 figs

Note: Marked sampling locations are approximate.



Key:

0701-A ●	Ambient Air Sample Location	*PCM*	Phase Contrast Microscope
f/cc	fibers per cubic centimeter of air (PCM)	*TEM*	Transmission Election Microscope
s/cc	structures per cubic centimeters of air (TEM)		

Note: General site-wide cleanup.
Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

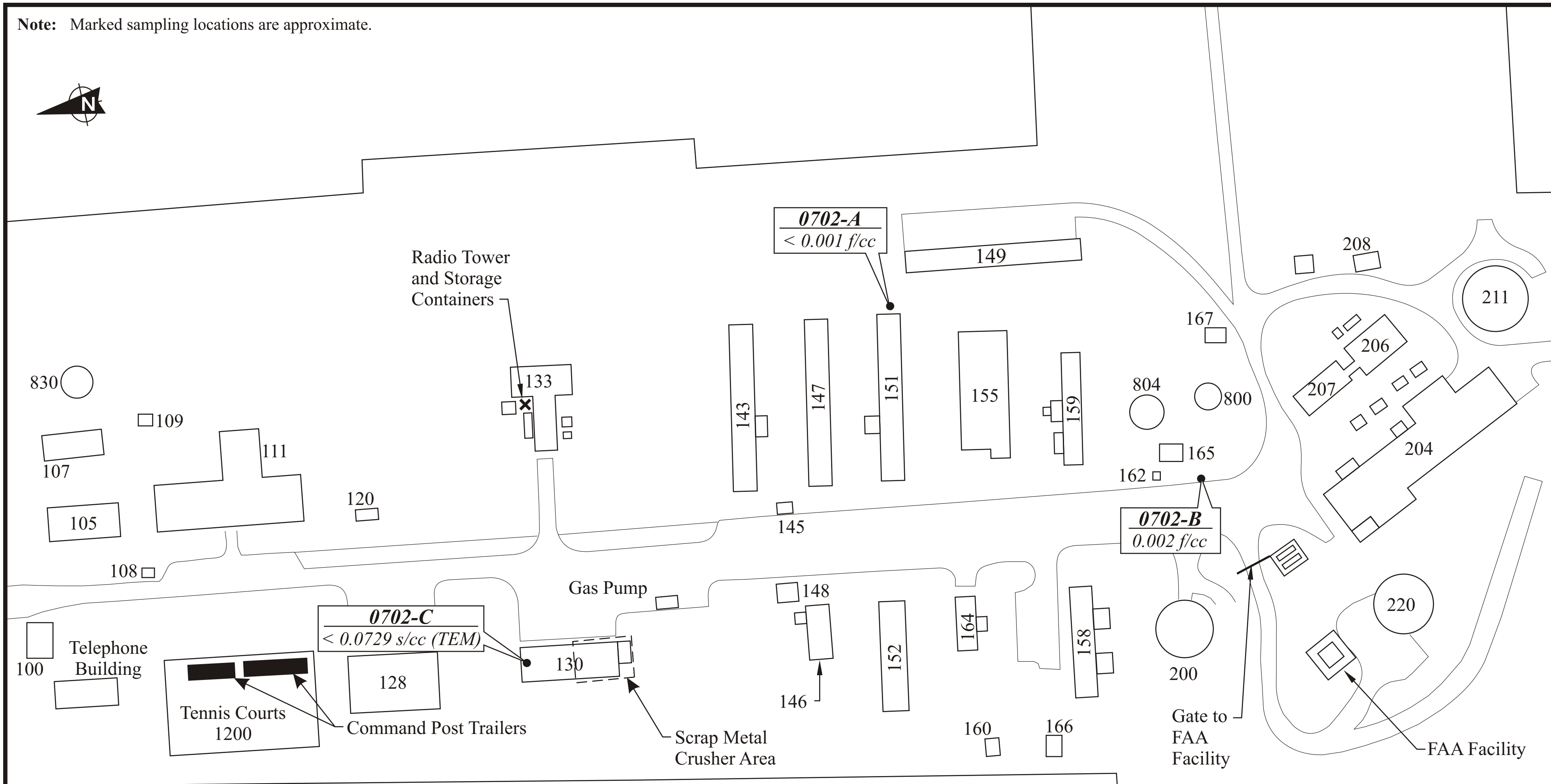
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-18
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (July 1, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs



Key:

0702-A ●	Ambient Air Sample Location	*PCM*	Phase Contrast Microscope
f/cc	fibers per cubic centimeter of air (PCM)	*TEM*	Transmission Election Microscope
s/cc	structures per cubic centimeters of air (TEM)		

Note: General site-wide cleanup.
Results are from PCM or TEM analysis.
Results are PCM unless otherwise indicated.

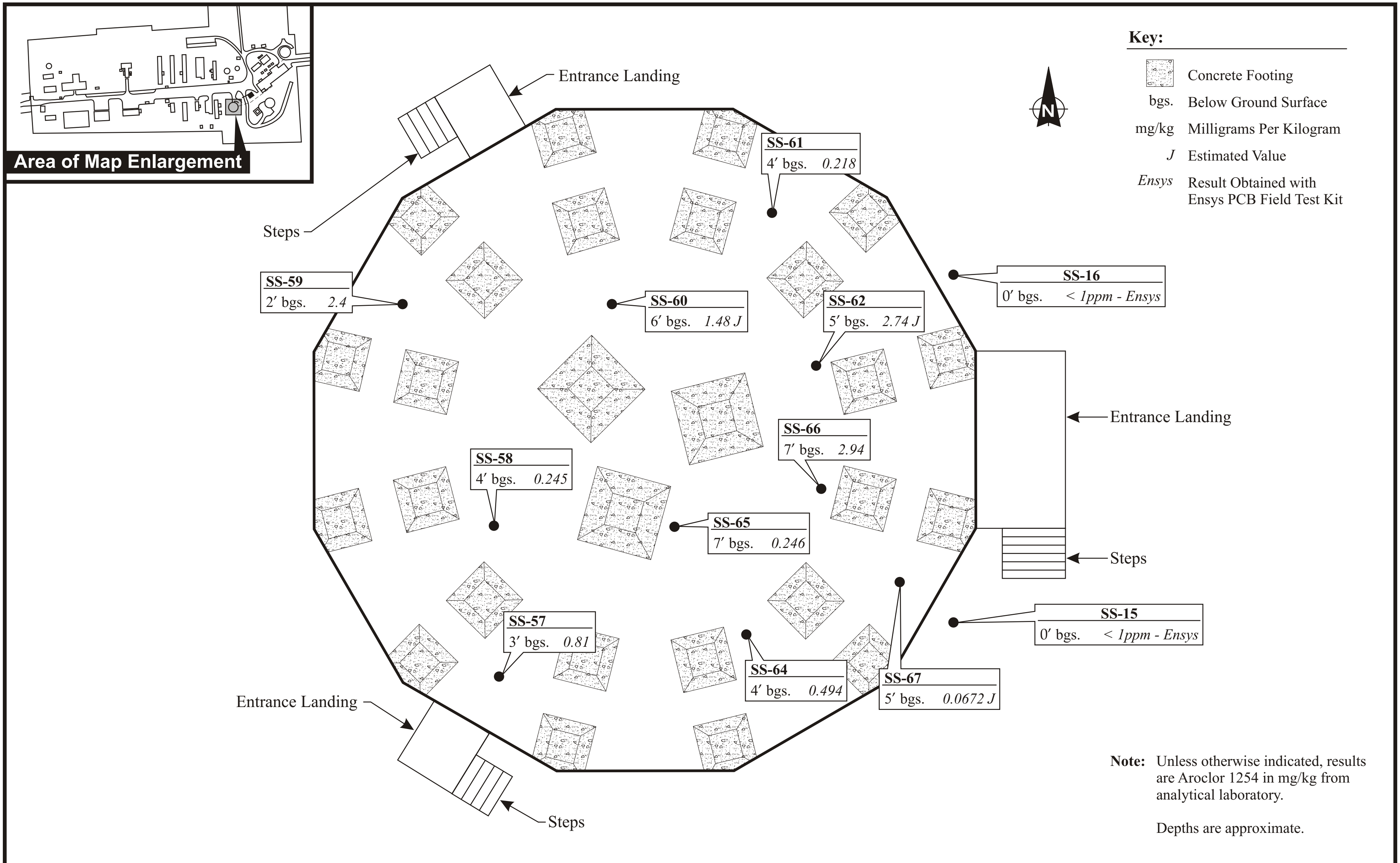
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 100 200
Approximate Scale in Feet

Figure 4-19
REMOVAL ACTION REPORT
AMBIENT AIR SAMPLING LOCATIONS (July 2, 2004)

Date:	Drawn by:	
12/29/04	AES	10:START-2\04060001\Section 4 figs

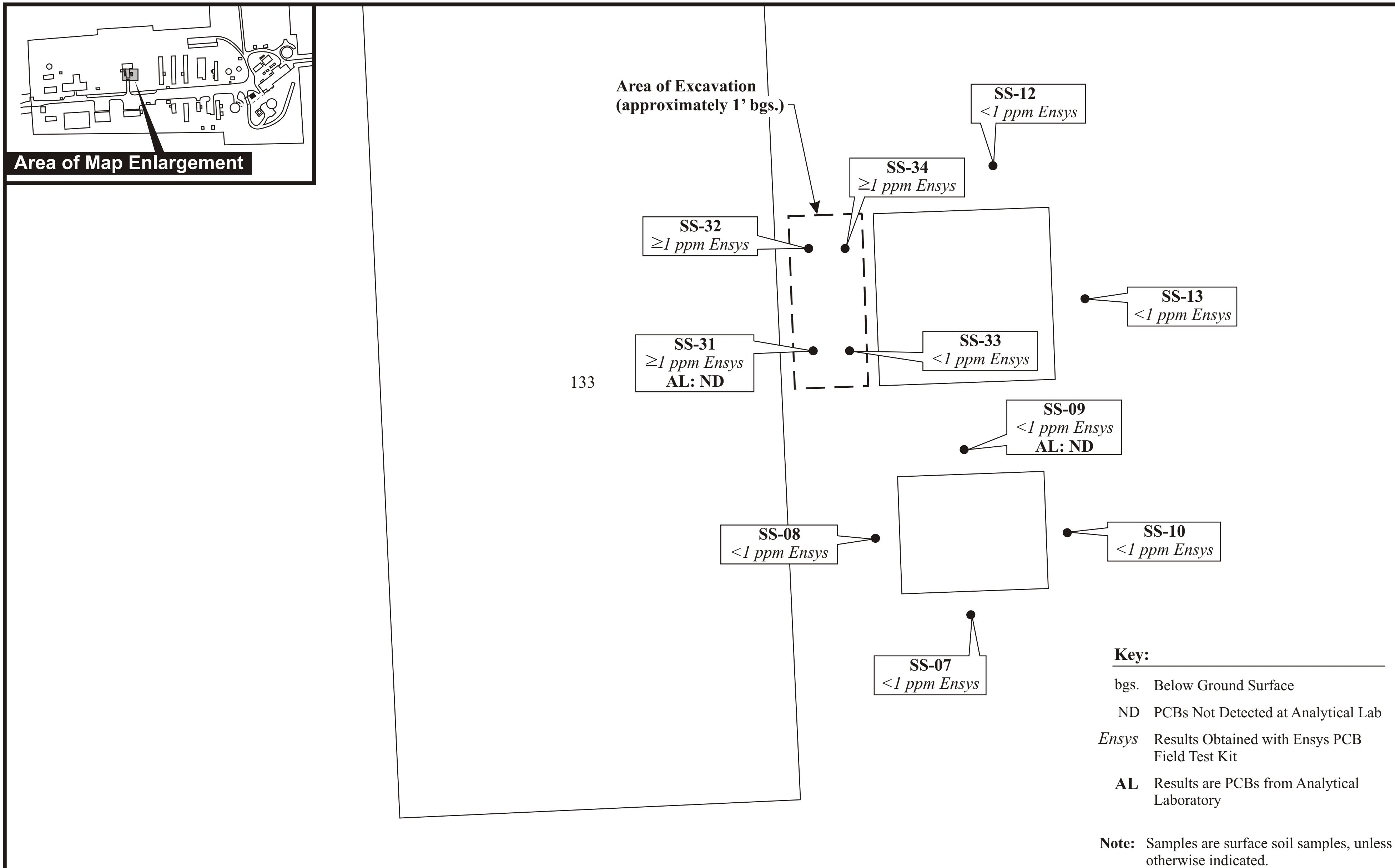


ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

Figure 4-20
BUILDING 200 (RADOME)
PCB RESULTS AFTER FINAL EXCAVATION

Date: 12/29/04
Drawn by: AES
10:START-2\04060001\fig 4-20



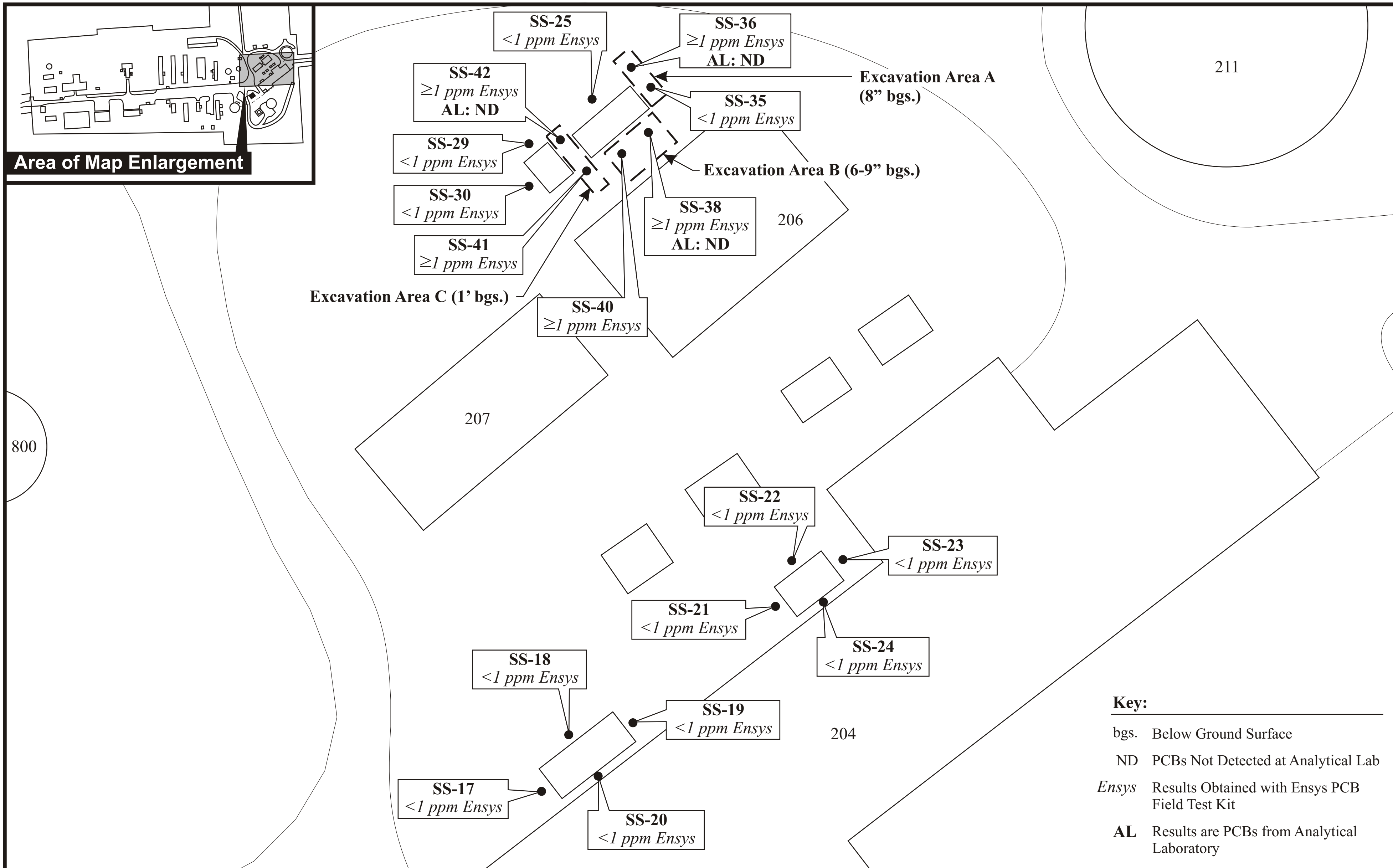
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 5 10
Approximate Scale in Feet

Figure 4-21
BUILDING 133
PCB RESULTS AFTER EXCAVATION

Date: 12/29/04
Drawn by: AES
10:START-2\04060001\fig 4-21



ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

BURNS ASBESTOS REMOVAL ACTION
FORMER BURNS AIR FORCE RADAR RANGE
Harney County, Oregon

0 10 20
Approximate Scale in Feet

Figure 4-22
BUILDINGS 204 AND 206
PCB RESULTS AFTER EXCAVATION

Date: 12/29/04
Drawn by: AES
10:START-2\04060001\fig 4-22

5. QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance/quality control (QA/QC) data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of sampling equipment, glassware and reagents. Specific QC requirements for laboratory analyses are incorporated in the *Contract Laboratory Program Statement of Work for Organic Analyses* (EPA 2003). These QC requirements or equivalent requirements found in the analytical methods were followed for analytical work on the project. This section describes the QA/QC measures taken and provides an evaluation of the usability of data presented in this report. Data validation memoranda and analytical data reports are provided in Appendix D (bulk asbestos), Appendix F (air), and Appendix G (PCBs).

All samples were collected in accordance with the SSSP (E & E 2004), the START Quality Assurance Project Plan (QAPP; E & E 2003), and the Sample Plan Alteration Form for field activities..

PCB soil and wipe samples were analyzed in the field by a START-2 scientist in accordance with EPA SW-846 Method 4020. Nineteen of these soil samples (approximately 32%) were also analyzed for PCBs by STL-Seattle, Inc., of Tacoma, Washington, a commercial laboratory, in accordance with EPA SW-846 Method 8082. Sixty-eight air filter samples were analyzed for asbestos fibers by PCM in the field by Dale Voeller of Advantage Environmental, Inc., a NIOSH-certified PCM analyst. Twenty-seven additional air filter samples were analyzed for asbestos by PCM and TEM at EMSL Analytical, Inc., a commercial laboratory, of Westmont, New Jersey. PCM analyses were performed in accordance with NIOSH Method 7400 and TEM analyses were performed in accordance with the EPA Level II Method with modifications to meet AHERA specific sensitivity and fiber counts. Asbestos analyses of bulk materials samples were performed by the ODEQ laboratory in Portland, Oregon, and by Environmental Hazard Services, LLC., of Richmond, Virginia, in accordance with EPA Method 600/R-93/116.

Data were reviewed and validated by START-2 chemists. Data qualifiers were applied as necessary according to the following guidance:

- *EPA* (1990) *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures*; and
- *EPA* (1999) *Contract Laboratory Program National Functional Guidelines for Organic Data Review*.

In the absence of other QC guidance, method-specific QC limits also were utilized to apply qualifiers to the data.

5.1 SATISFACTION OF DATA QUALITY OBJECTIVES

The following EPA (EPA 2000) guidance document was used to establish data quality objectives (DQOs) for this project:

- *Guidance for the Data Quality Objectives Process* (EPA QA/G-4), EPA/600/R-96/055.

The OSC determined that definitive data without error and bias determination would be used for the sampling and analyses conducted during the field activities. The data quality achieved during the field work produced sufficient data that met the DQOs stated in the SSSP (E & E 2004). A detailed discussion of accomplished objectives is presented in the following subsections.

5.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

QA samples for the air analyses included field blank samples. A total of four field blank samples were included with the 31 air samples, meeting the QC criteria of one per 20 samples. Field blanks are discussed in subsection 5.4.3. QC samples for organic analyses included matrix spike/matrix spike duplicate (MS/MSD) samples at a rate of one MS/MSD per 20 samples per matrix.

5.3 PROJECT-SPECIFIC DATA QUALITY OBJECTIVES

The commercial laboratory data were reviewed to ensure that DQOs for the project were met. The following describes the laboratories' abilities to meet project DQOs for precision, accuracy, and completeness and the field team's ability to meet project DQOs for representativeness and comparability. The laboratory and the field team were able to meet DQOs for the project.

5.3.1 Precision

Precision measures the reproducibility of the sampling and analytical methodology. Laboratory and field precision is defined as the relative percent difference (RPD) between duplicate sample analyses. The laboratory duplicate samples measure the precision of the analytical method.

The RPD values were reviewed for all laboratory duplicate samples. All duplicate results were within QC limits. The DQO for precision of 85% was met.

5.3.2 Accuracy

Accuracy measures the reproducibility of the sampling and analytical methodology. Laboratory accuracy is defined as the MS % recovery. The MS % recovery values were reviewed for all MS analyses. All MS recoveries were within QC limits. The project DQO for accuracy of 85% was met.

5.3.3 Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). Three asbestos air filter samples were not analyzed because of dust overloading or faulty filter assembly. All data were reviewed for usability. No sample results for organic or asbestos analyses were rejected. Therefore, the project DQO for completeness of 90% was met.

5.3.4 Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point or environmental condition. The number and selection of samples were determined in the field to account accurately for site variations and sample matrices. The DQO for representativeness of 85% was met.

5.3.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this site followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

5.4 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL PARAMETERS

The laboratory data also were reviewed for holding times/temperature, laboratory blank samples, and field blank samples. These QA/QC parameters are summarized below. In general, the laboratory and field QA/QC parameters were considered acceptable.

5.4.1 Holding Times/Temperature

All samples were analyzed within the method-specified holding times. One sample shipment for PCB soils was received at 7.1 °C, slightly exceeding the temperature limit of 4 °C (± 2 °C). No action was taken based on this slight discrepancy.

5.4.2 Laboratory Blanks

All laboratory blanks met the frequency criteria. There were no target analytes detected in any blanks.

5.4.3 Field Blanks

Field blanks were collected for the air samples. Two field blanks were collected for the air samples analyzed by PCM, and two field blanks were collected for the air samples analyzed by TEM. The filter cartridges for the field blanks were handled in an identical manner as the air sample filter cartridges, with the exception that air was not collected through the field blank filter cartridges. The field blanks were bagged, labeled, and submitted to the laboratories with the air samples. The results for all four field blanks were less than the limit of detection, with no fibers detected.

5.5 FIELD INSTRUMENTATION

A START-2 scientist analyzed 60 soil samples and 29 wipe samples in the field with an Ensys immunoassay PCB test kit. The test kits used an Aroclor 1260 standard with detection limits of 1 and 10 ppm for soil samples and 5 and 10 μg/100 cm^2 for wipe samples.

Nineteen of the 60 soil samples were submitted to an analytical laboratory for confirmation testing. Of these 19 confirmation samples, a total of 25 Ensys field tests were run (six samples were analyzed at two detection levels). An additional five samples were submitted directly to the analytical laboratory because of time constraints.

A comparison of the analytical and field results for the PCB soils indicated that most of the Ensys field results agreed with the analytical laboratory results, although there were some discrepancies. Of the 25 possible comparisons, 19 of the laboratory results were exactly as determined by the Ensys field test results, for a success rate of 76%. Two of the discrepancies occurred when both the Ensys and laboratory results indicated the presence of PCBs, but the concentrations did not exactly match (Samples SS-43 and SS-48). Four of the discrepancies involved false positive results, where the Ensys field test indicated a positive result at 1 ppm, while the analytical result indicated that PCBs were not detected (Samples SS-31, SS-36, SS-38, and SS-42). The specific cause for the false positive results is not known, but these four samples were all analyzed in the same batch, indicating a possible problem with the testing during that particular batch. The results for that batch also indicated positive detections at 1 ppm for most of the other samples, indicating those samples may be false positives as well. The results show an acceptable correlation and the field screening accomplished its' objective of identifying areas of contamination and of determining the extent of contamination.

6. PROBLEMS ENCOUNTERED

Overall, the RA was successfully completed with no serious issues or problems. However, a few unforseen issues and problems were encountered. These issues are discussed below.

- While researching ARARS for the action memo, the OSC determined that the site was potentially eligible for the NRHP (See Section 3.2.2.3). The OSC worked closely with the Oregon SHPO to determine what measures were required to satisfy the SHPO's historical documentation needs, prior to the RA. The SHPO requested that EPA document the condition of the site prior to the RA, through extensive photography of the site and its buildings with professional-quality black and white film.

- During the first few days of the RA, nesting migratory birds were observed inside many of the site buildings (See Section 3.2.2.4). Because the birds were protected from harm by the Migratory Bird Treaty Act, no building containing the nests could be demolished while the nesting birds were present. One option may have been to postpone the RA until later in the year after all of the nestlings had fledged. However, the nesting birds were not discovered until after EPA had mobilized to the site, and a second mobilization would have been costly. The OSC consulted with officials from USFWS and ODFW, and they recommended that the bird nests be recovered and taken to certified bird rehabilitator. The OSC and START-2 removed the bird nests and delivered them to ODFW, and the RA was able to continue with minimal delay.

- EPA performed extensive cleaning of the ground around the building sites after demolition to pick up loose pieces of ACM debris. However, observations indicated that these small pieces of ACM debris continued to resurface after repeated removal of overlying debris. It is expected that ACM will continue to resurface into the future, and that repeated phases of removal may be required to pick up most of the debris. During October 2004, EPA established seven test plots to further evaluate ACM debris resurfacing (see Section 3.2.5).

- One of the ERRS equipment operators went to the hospital for an eye irritation. Apparently, the worker had a pre-existing eye condition that was aggravated by dust while the worker was in the command post. At the hospital, the worker was diagnosed with an eye scratch, was given eye drops, and returned to work on site the same day.

7. COMMUNITY RELATIONS

Throughout the duration of the RA, the OSC maintained communications with the public and applicable state and local agencies.

Throughout the RA, the OSC coordinated closely with officials of ODEQ, including Orphan Site Program Project Manager David Anderson and Frank Messina of the ODEQ Air Quality & Asbestos office in Bend, Oregon. Mr. Anderson and Mr. Messina both visited the site several times throughout the RA to monitor the progress of the cleanup actions.

The OSC coordinated the site activities with representatives from the various companies and agencies that operate facilities and maintain land bordering the site. The OSC notified representatives of the three facilities that remain active at the site, including CenturyTel, FAA, and BPA. The OSC also sought access agreements from FAA and BLM regarding the removal of ACM steam line from their respective properties.

The OSC notified the Oregon SHPO regarding the potential status of the site with respect to the NRHP. The SHPO informed EPA that the site was potentially eligible for the NRHP, and therefore EPA completed detailed documentation of the site for SHPO.

Once nesting migratory birds were discovered in the site buildings, the OSC notified and consulted with USFWS and ODFW regarding appropriate mitigating response.

The OSC notified the local Burns Paiute tribe to determine whether there were any tribal concerns regarding the RA. Local government officials were also notified regarding the RA, and the OSC met with two representatives of the county government at the site.

Throughout the RA, EPA provided information regarding the site to the public. EPA developed two Fact Sheets for the site, which were sent to local news agencies. The OSC also gave an interview at the site to a local reporter. EPA set-up a website for the RA (www.epaosc.org/BurnsAsbestosRemoval) to which the OSC posted relevant information (photos, Pollution Reports, etc.) throughout the RA. Appendix H includes the Fact Sheets, all Pollution Reports, screen-shots from the website, and copies of newspaper clippings.

8. HEALTH AND SAFETY

The EPA OSC maintained ultimate authority and responsibility for site safety during the RA. START-2 and ERRS each developed a site-specific health and safety plan (H&SP)   The OSC directed the USCG PST to develop a master H&SP for the site, to which the ERRS and START-2 H&SPs were attached. The PST site H&SP is included as Appendix I. The OSC also directed the PST to oversee and implement the health and safety procedures for the site.

8.1 SITE HEALTH AND SAFETY PROTOCOLS

At the beginning of the RA, the OSC conducted a general site safety meeting to establish the health and safety procedures for the site. Additionally, all site workers were required to review the PST H&SP and sign it. Daily safety meetings were conducted at the beginning of each day of site work. The safety meeting was attended by all personnel present, including the OSC, PST, ERRS, START-2, and any subcontractors. During the daily safety meetings, the on-site crew discussed the planned activities for that day and any task-specific health and safety issue. The daily safety meeting also included a review of any health and safety-related issue from the previous day.

The primary chemical hazards associated with the site were asbestos and PCBs. There were also many physical hazards associated at the site, including: collapsing buildings; the use of heavy equipment for the demolition of site buildings, excavation, and loading of wastes; fall and trip hazards from hidden trenches and sewers; electrical power lines; poisonous snakes; animal wastes from birds and rodents; and general slips, trips, and falls.

Based on these hazards, the minimum level of PPE for the site was Level D, including safety glasses, steel-toed safety shoes, and a hard hat. For certain tasks, exclusion zones requiring increased levels of PPE were established. For any activity that involved potential contact with PCB-contaminated materials, a modified Level D was required that included Tyvek overcoats, latex booties, and nitrile gloves. For any activity that involved potential contact with disturbed or airborne asbestos, Level C was required, including respiratory protection with HEPA cartridges. The exclusion zones were established on a daily and building-specific basis, depending on the planned activity for that specific day.

Prior to any building demolition, the demolition crew conducted a building-specific safety meeting to discuss specific duties and safety issues for that specific building. The crew ensured that no one was inside the building prior to demolition, and spotters (typically the ERRS foreman and a member of the PST) were at the building site to observe the demolition for health and safety issues. The on-site crew also used portable, hand-held radios to maintain communication regarding health and safety issues.

The only health and safety incident of note involved an eye injury to an ERRS worker. One of the ERRS equipment operators went to the hospital for an eye irritation. Apparently, he had a pre-existing eye condition that was aggravated by dust while the worker was in the command post. At the hospital, the worker was diagnosed with an eye scratch, was given eye drops, and returned to work on site the same day.

8.2 PERSONNEL ASBESTOS EXPOSURE MONITORING

During the RA, the on-site PCM analyst (Dale Voeller of Advantage) also collected personal air samples to determine the exposure risk to workers. From June 14 through June 30, Advantage monitored site workers for exposure risks by collecting personal air samples. Generally, Advantage placed air monitoring pumps on a worker with a PCM cassette attached to the body within the breathing zone (near the shoulders or upper torso). The workers selected for monitoring included both ERRS and abatement workers, and the monitoring was designed to cover a range of tasks at the site, including operating equipment during demolition, standing on the ground near demolition activity, operating the water truck, and performing asbestos abatement.

Because of concerns of overloading from dust, multiple air samples were collected from the worker being monitored that day, and the results were combined into an 8-hour time-weighted average (TWA). Additionally, some samples were collected at 30 minute intervals to compare to the short term exposure limit (STEL) of 1.0 f/cc. The air sample cassettes were analyzed for asbestos fibers by PCM in accordance with NIOSH Method 7400 by the on-site analyst from Advantage.

The analytical reports for the personal air sampling are included in Appendix J, and the results are summarized in Table H-1. The data in Table H-1 includes results for each individual sample as well as a calculation of the 8-hr TWA. The results indicate that approximately half of the individual personal air samples were less than detectable limits (<LOD), and only one of the composite 8-hr TWA values exceeded the OSHA PEL of 0.1 f/cc. The 8-hr TWA value (< 0.17 f/cc) that did exceed the OSHA PEL occurred on June 19, 2004, for an asbestos worker. The high TWA value can be attributed to the relatively high concentration of 2.22 f/cc obtained for the short term sample STEL-31. It should be noted that these results were obtained for an asbestos worker working inside a negative air enclosure. The asbestos worker was wearing Level C PPE including appropriate respiratory protection.

9. COST SUMMARY

EPA costs for the Burns Asbestos RA included PST, START-2, and ERRS. The estimated costs for the removal action, known to EPA as of December 30, 2004, are summarized below:

	Cost to Date	Ceiling Costs
Intramural Costs		
EPA (Direct Costs)	$24,372	$25,000
Extramural Costs		
USCG PST	$17,980	$30,000
ERRS	$453,836	$500,000
START-2	$120,000	$125,000
Total	$616,188	$680,000

10. EFFECTIVENESS OF REMOVAL ACTION

In 2004, EPA Region 10 performed a removal action at the former Burns Air Force Radar Range in Harney County, Oregon, to remove CERCLA hazardous substances, including asbestos and PCBs, from the site. The site consisted of approximately 25 buildings in various states of disrepair. Asbestos-containing building materials inside the site buildings were damaged, and there was a potential exposure risk from the asbestos to site visitors. A small quantity of PCB-contaminated soil and steel were also present on site.

EPA performed the RA in response to a request by ODEQ in April 2004. EPA and ODEQ were concerned that the potential exposure risk from the asbestos would only increase over time as the site buildings continued to fall into disrepair from neglect and vandalism. Additionally, EPA and ODEQ were concerned that a future property owner may improperly demolish the site buildings and dispose of the asbestos, which would have greatly increased the exposure risks and the associated costs required to clean up the site.

To address these risks, EPA performed the primary phase of the RA from June 10 to July 3, 2004. A second phase of field work, to complete the RA, was conducted from October 11 through 15, 2004. The RA was performed by ERRS, under the supervision of the OSC, with technical assistance provided by START-2 and the USCG PST. Additionally, the ERRS contractor performed some cleanup tasks to address physical hazards from the site buildings on behalf of ODEQ.

To achieve these objectives, EPA abated the site buildings of friable ACM, demolished the site buildings, segregated the demolition debris into ACM debris and non-ACM debris, and excavated and removed several sections of an ACM steam line. All asbestos abatement work was performed by a state-certified abatement contractor, as a subcontractor to ERRS. EPA also removed PCB-contaminated soil and steel from specific locations on site.

Site wastes were loaded into trucks for proper disposal at off-site facilities. The waste streams and approximate quantities disposed of from the site included: 20.5 tons of friable ACM; 357 tons of ACM debris; 534 yd^3 of demolition debris (non-ACM); and 200 tons of PCB-contaminated soil and debris. Additionally, approximately 65 tons of non-contaminated metal scrap was taken off site by a metal recycler.

Throughout the RA, START-2 performed ambient air sampling to ensure airborne asbestos fibers were not released from the abatement, demolition, and waste loading operations. Analytical results of this ambient air sampling indicated that no significant quantities of asbestos fibers were released.

By the end of the RA, the asbestos containing building materials that had been identified on site were removed, and all abandoned site buildings were demolished. One site building (Building 133) was only partially demolished because it was being used by the property owner to support an active radio antenna. The portion of Building 133 that remained was a concrete block structure in good condition. Two additional concrete block buildings, Buildings 204 and 206, were demolished in place by ODEQ (via EQM), and crushed piles of concrete and debris were left on the original concrete slab foundations. For the remainder of the site buildings, only the concrete slabs or concrete block foundations remained. One of the large water tanks (Tank 804) was demolished, with only the concrete foundation remaining. The other large water tank (Tank 800), which had been installed under a mound of soil, was not demolished. ERRS welded a steel plate on the manhole entrance of this tank, on behalf of ODEQ, to limit access to it by the public. Three active facilities on Burns Butte (CenturyTel, FAA, and BPA), which were formerly part of the Air Force station, were not disturbed during the RA and remain on site.

At the conclusion of the RA, EPA contractors performed a sweep of the ground around and underneath each building site to pick up small, loose pieces of ACM debris. Most of these pieces of ACM debris were from broken sections of ACM floor tile and CAB siding and are approximately one inch in diameter or smaller. Although EPA performed these final cleaning steps as much as possible within the budget and schedule of the RA, it is likely that small pieces of ACM debris remain at the site. EPA also observed that small pieces of ACM debris continue to resurface, even after an area is cleared, possibly due to erosion from wind and rain. For example, EPA performed a final surface cleaning prior to demobilizing at the end of the June 2004 phase. During the October 2004, additional ACM debris was observed in areas that had been previously cleared. EPA has notified ODEQ that it may be necessary to perform several periodic rounds of site cleaning, perhaps annually or semiannual, to ensure that future resurfaced ACM debris is removed.

EPA addressed PCB contamination in areas of known or suspected contamination at Buildings 200, 133, 204, and 206. Based upon sampling and field testing performed by START-2, PCB contamination was found at the areas of interest at Building 200, 133, and 206. ERRS removed approximately 2 yd^3 of PCB-contaminated soil at Building 133 and 3 yd^3 of PCB-contaminated soil at Building 206. Confirmation samples submitted to an analytical laboratory indicated that PCBs were not detected in the excavated areas. In Building 200, EPA removed approximately 150 yd^3 of PCB-contaminated soil and steel debris. Laboratory analytical results for samples collected from the PCB-contaminated soil indicated that Aroclor 1254 was detected at a concentration as high as 145 mg/kg. Final confirmation samples collected from the bottom of the excavated area inside the Building 200 foundation indicated that PCB contamination was still present at concentrations ranging from 0.0672 J mg/kg (SS-67) to 2.94 mg/kg (SS-66). All of the samples had concentrations less than the ODEQ industrial standard for PCB of 7.5 mg/kg, with four samples exceeding the ODEQ residential standard of 1.2 mg/kg. Following excavation, the area inside the Building 200 foundation was backfilled to the original grade with two to six feet of soil from elsewhere on the site.

Other contaminants may still be present at the site. Additional PCB contamination may be present at the site in areas that were outside the scope of the RA. The review of historic documents indicated that there may be other potential environmental concerns at the site, including questions about USTs that were present at one time and possible disposal sites (USACE 1991a). These potential concerns were outside the scope of work of this RA.

11. REFERENCES

Ader, Mark, September 10, 1996, Site Assessment Manager, United States Environmental Protection Agency, letter to Russell Wilson / Marion Towery regarding the former Burns Air Force Radar Range.

Clayton Group Services, March 19, 2003, *Clayton Work Order No. 03030329, Asbestos and Metals Analytical Results*, to Bonneville Power Administration.

Code of Federal Regulations (CFR) Title 40 Part 61 Subpart M (40 CFR Part 61), February 18, 2004, National Emission Standard for Asbestos.

Code of Federal Regulations (CFR) Title 40 Part 761 (40 CFR Part 761), February 18, 2004, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.

Code of Federal Regulations (CFR) Title 40 Part 763 Subpart E (40 CFR Part 763), February 18, 2004, Asbestos Containing Materials in School.

Ecology and Environment, Inc. (E & E), June 2004, *Burns Asbestos Removal Action Site Specific Sampling Plan*, (Site-Specific Sampling Plan), prepared for the U.S. Environmental Protection Agency, Contract No. 68-S0-01-01, Seattle, Washington.

———, January 2003, Generic Quality Assurance Project Plan for Removal Program Sampling, prepared for the U.S. Environmental Protection Agency, Contract No. 68-S0-01-01, Seattle, Washington.

E. P. Johnson Construction and Environmental, Inc. (E. P. Johnson), April 1997, *Project Field Report, Contract No. DACW57-94-D-0004, Delivery Order No. 8, Remove Underground Storage Tanks and Contaminated Soil, Former Burns Air Force Station, Bunrs [sic], Oregon, Volume I*, prepared for USACE, Portland District Office.

Geotechnical Resources, Inc. (GRI), January 24, 1995, *Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS), Remedial Design (RD), Fort Stevens Military Reservation, Heceta Head Light Station, Burns Air Force Station*, prepared for the USACE, Portland District.

Harrell, Ernest J., December 17, 1991, Major General, USA, Commanding, United States Army Corps of Engineers (USACE), *Defense Environmental Restoration Account, Formerly Used Defense Sites Program, Findings and Determination of Eligibility, Burns Air Force Station, Oregon, Site Number F10OR016300.*

Jones, Howard B., January 9, 1998, Chief, Planning and Engineering Division, United States Army Corps of Engineers, letter to ODEQ Waste Management and Cleanup Division for ODEQ ID Number ORR000000877.

Jones, Howard B., February 5, 1997, Chief, Planning and Engineering Division, United States Army Corps of Engineers, letter to Steven Paiko, ODEQ Underground Storage Tank Compliance Section.

Lau, David J., September 30, 1971, Appraisal of Burns Air Force Station, Burns, Harney County, Oregon.

Lockheed Martin Technology Services, March 12, 2003, *Directional Finder, Burns, Oregon, Trip Report*, prepared for the FAA.

Lockwood, Ray S., May 22, 1980, Realty Specialist, General Services Administration, *PCB Inspection, Burns AF; GR-Ore-597*, to Harold J. Hansen, Director, Real Property Division.

Maptech, 2001, Terrain Navigator, Pacific Northwest Region, WA, OR.

Marine & Environmental Testing, Inc., May 7, 2003, *Industrial Hygiene Survey, Job 03-10763, Conducted for Bonneville Power Administration, Burns Radio Station Mercury Monitoring, Burns, OR.*

Monroe, Sheila, April 20, 2004, Eastern Region Cleanup Manager, Oregon Department of Environmental Quality (DEQ), *Memorandum: Request for EPA Removal Support – Burns Air Force Site, Burns, Oregon ECSI No. 1703,* to Chris Fields, EPA Region 10, Removal Program.

Monson, Robert L. April 24, 1995, DERP Project Manager, United States Army Corps of Engineers, *Memorandum for Commander North Pacific Division, ATTN: CENPD-PM-MP (HAN); Subject: DERP-FUDS Project No. F10OR016302, Limited Remedial Investigation at the Former Burns Air Force Station, Burns, Oregon.*

National Institute for Occupational Safety and Health (NIOSH), February 2004, *Pocket Guide to Chemical Hazards.*

Oregon Department of Environmental Quality (ODEQ), November 2003a, *Focused Feasibility Study, Former Burns Air Force Radar Station*.

______, October 8, 2003b, *Analytical Report, Burns Air Station, Sampling Event: 20031075*, Reported to Frank Messina of ODEQ.

______, October 8, 2003c, *Analytical Report, Burns Air Station, Sampling Event: 20031076*, Reported to David Anderson of ODEQ.

______, November 5, 2002a, *Analytical Report, Radar Station, Hines Oregon, Sampling Event: 20021144*, Reported to Frank Messina of ODEQ.

______, May 29, 2002b, *Analytical Report, Radar Station-Hines, Sampling Event: 20020454*, Reported to Frank Messina of ODEQ.

______, December 1997, *Generic Remedies for Soils Contaminated with Polychlorinated Biphenyls (PCBs)*.

Oregon Department of Human Services (ODHS), April 28, 2003, *Health Consultation, Burns Air Force Range (a/k/a Burns Air Force Radar Station), Burns, Harney County, Oregon, EPA Facility ID: OR0001096957*, prepared in conjunction with the U.S. Department of Health and Human Services, Public Health Services, Agency for Toxic Substances and Disease Registry.

Ranzetta, Kirk, June 2, 2004, Review and Compliance Coordinator, Oregon State Historic Preservation Office, e-mail regarding historic status of the site with Michael Szerlog, United States Environmental Protection Agency.

Roberts, Thomas D., August 18, 1971, Realty Specialist, Real Property Division, PMDS, General Services Administration (GSA), *Inspection of Burns Air Force Station near Burns, Oregon; D-Ore-597*, to Chief Real Property Division, PMDS.

Roman, Bud, April 10, 2002, Oregon Department of Environmental Quality Underground Storage Tank Program, e-mail to Brian McClure of ODEQ, regarding USTs at the former Burns Air Force Radar Range site.

Stockton, Steven L. June 15, 1995, Chief, Planning and Engineering Division, USACE, letter to Eldean Williams, ODEQ Underground Storage Tank Compliance Section.

______, February 1, 1994, Chief, Planning and Engineering Division, USACE, *Memorandum for Ch, CENPP-RE, ATTN: CENPP-RE-A; Subject: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS), Former Burns Air Force Station (AFS), Containerized/Hazardous and Toxic Waste (CON/HTW) Removal and Hazardous and Toxic Waste (HTW) Removal.*

Todd, John, May 25, 1993, Civil Engineer, United States Army Corps of Engineers (USACE), *Memorandum for Record, DERP-FUDS, Trip Report, Burns Air Force Station.*

United States Army Corps of Engineers (USACE), March 16, 1995, *Delivery Order No. 08, Former Burns Air Force Station, Near Burns, Oregon, Underground Storage Tank Removal, 5 Tanks, Statement of Work*.

______, July 31, 1991a, *Site Survey Summary Sheet for DERP-FUDS Site No. F10OR016300, Burns Air Force Station, OR*.

______, July 31, 1991b, *Project Summary Sheet for DERP-FUDS CON/HTW Project F10OR016301, Burns Air Force Station, Site No. F10OR016300*.

______, July 31, 1991c, *Project Summary Sheet for DERP-FUDS HTW Project F10OR016302, Burns Air Force Station, Site No. F10OR016300*.

______, July 31, 1991d, *Project Summary Sheet for DERP-FUDS BD/DR Project F10OR016303, Burns Air Force Station, Site No. F10OR016300*.

United States Environmental Protection Agency (EPA), May 28, 2004, *Action Memorandum: Request for a Time-Critical Removal Action at the former Burns Air Force Station Radar Base site, Burns, Harney County, Oregon; Site ID: 10-CJ*, from Michael J. Szerlog, On-Scene Coordinator, to Kathryn M. Davidson, Acting Director, Office of Environmental Cleanup, Seattle, Washington.

______, 2003, *Contract Laboratory Program Statement of Work for Organic Analyses.*

______, August 2000, Guidance for the Data Quality Objectives Process (EPA QA/G-4), EPA/600/R-96/055.

______, October 1999, *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-05A-P, PB99-963506, EPA/540/R-99/008.

______, April 1990, Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures, Interim Final, EPA/540/G-90/004, OSWER Directive 9360.4-01.

URS Consultants, Inc., August 29, 1996, *Preliminary Assessment Report for Burns Air Force Range*, prepared for EPA.

Walsavage, Frederick, J., July 15, 2003, Environmental Protection Specialist, Bonneville Power Association (BPA), to Brian McClure, Senior Environmental Engineer, ODEQ.

Western Drilling Co., June 2, 1966, Water Well Report for US Air Force, Burns, OR.

Western Regional Climate Center (WRCC), Division of Atmospheric Sciences, Desert Research Institute, 2004, http://www.wrcc.dri.edu/.

APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

PHOTOGRAPH IDENTIFICATION SHEET

Camera Type: Canon Power Shot A70 Digital Camera **TDD No. 04-06-0001**
Lens Type: Canon Zoom Lens **Site Name: Burns Asbestos Removal Action**

Photo No.	Direction	By	Date	Time	Description
1	W	SGH	10/11/04	1059	View of Burns Butte.
2	S	SGH	6/12/04	1636	View to the south of the former Burns Air Force Radar Range.
3	N	SGH	5/10/04	1252	View to the north of the former Burns Air Force Radar Range.
4	SW	SGH	6/11/04	1656	Buildings 207 and 206 (connected, foreground) and 204 (background).
5	SW	SGH	6/11/04	1724	Building 200 (radome).
6	S	LM	6/11/04	1227	Significantly damaged, friable ACM (pipe insulation).
7	NE	SGH	5/25/04	1302	Friable ACM (pipe insulation).
8	E	LM	6/11/04	1251	Cement-asbestos board (CAB) siding.
9	S	SGH	5/10/04	1253	Significantly damaged ACM floor tile.
10	SW	SGH	5/10/04	1153	Building 100, with collapsing roof.
11	W	SGH	5/10/04	1310	Interior of Building 158, with damaged walls and ceiling.
12	NE	SGH	6/11/04	1713	Building 149 with visible fire damage and collapsing roof.
13	N	LM	6/16/04	1814	START-2 collects bulk samples for asbestos analysis.
14	NE	LM	6/19/04	1310	START-2 collects wipe samples for PCBs inside Building 200 (radome).
15	S-SE	SGH	6/12/04	0914	Typical bird nest inside damaged wall.
16	E	LM	6/14/04	1314	Bird nest recovery.
17	W	LM	6/24/04	0931	Abatement worker prepares an ACM pipe run for removal.
18	E	LM	6/19/04	1335	Negative air enclosure for asbestos abatement at Building 155.
19	SW	SGH	6/18/04	1147	Abatement workers prepare to remove a pipe with friable ACM.
20	E	LM	6/24/04	1128	Abatement worker removes ACM floor tile from concrete slab.
21	E	LM	6/18/04	1628	ERRS loads a tank covered with friable ACM into waste container.
22	S	LM	6/14/04	1743	ERRS demolishes Building 105.

PHOTOGRAPH IDENTIFICATION SHEET

Camera Type: Canon Power Shot A70 Digital Camera **TDD No. 04-06-0001**
Lens Type: Canon Zoom Lens **Site Name: Burns Asbestos Removal Action**

Photo No.	Direction	By	Date	Time	Description
23	E	LM	6/23/04	1650	Excavator with shears attachment demolishes Tank 804.
24	NW	LM	6/24/04	1758	Excavator with shears attachment demolishes Building 200 (radome).
25	SE	LM	6/24/04	0914	ERRS water truck suppresses dust near Building 155.
26	NE	SGH	6/23/04	1638	View of site from the top of Building 200 (radome) during the RA.
27	W	LM	6/25/04	0834	Asbestos workers wrap the cut end of ACM steam line.
28	W	LM	6/25/04	0838	Excavator with shears attachment prepares to cut ACM steam line.
29	S	LM	6/25/04	1152	ERRS excavates ACM steam line near the FAA facility.
30	S	LM	6/25/04	1757	Asbestos workers wraps excavated ACM steam line.
31	E-NE	SGH	6/18/04	1038	Air sampling pumps near area of asbestos abatement.
32	NW	LM	6/16/04	1246	Air sampling pump near demolition.
33	N	SGH	10/14/04	1332	ERRS excavates PCB-contaminated soil in foundation of Building 200.
34	NW	SGH	10/14/04	1506	ERRS backfills the foundation of Building 200.
35	N	LM	6/17/04	0848	ERRS lines an empty waste container for ACM demolition debris.
36	NW	LM	6/21/04	1501	ERRS loads ACM demolition debris into lined waste containers.
37	W	LM	6/23/04	1127	ERRS separates scrap steel for recycling.
38	NE	LM	7/1/04	1306	Steel recycler consolidates scrap steel with metal crusher.
39	N-NW	SGH	10/11/04	1518	Test plot area for small pieces of ACM debris, near Building 149.
40	N-NW	SGH	10/11/04	1519	Close-up of Building 149 test plot, with small pieces of ACM debris.
41	S	SGH	10/14/04	1455	View of site to south, after removal action.
42	N	SGH	10/14/04	1446	View of site to north, after removal action.

Key:

ACM	= Asbestos-containing material.
CAB	= Cement-asbestos board.
E	= East.
ERRS	= Emergency and Rapid Response Services.
FAA	= Federal Aviation Administration.
LM	= Len Marcus.
N	= North.
PCBs	= Polychlorinated biphenyls.
RA	= Removal action.
S	= South.
SGH	= Steven G. Hall.
TDD	= Technical Direction Document.
W	= West.


Photograph 1. View of Burns Butte.


Photograph 2. View to the south of the former Burns Air Force Radar Range.

Photograph 3. View to the north of the former Burns Air Force Radar Range.

Photograph 4. Buildings 207 and 206 (connected, foreground) and 204 (background).


Photograph 5. Building 200 (radome).


Photograph 6. Significantly damaged, friable ACM (pipe insulation).


Photograph 7. Friable ACM (pipe insulation).


Photograph 8. Cement-asbestos board (CAB) siding.


Photograph 9. Significantly damaged ACM floor tile.


Photograph 10. Building 100, with collapsing roof.

Photograph 11. Interior of Building 158, with damaged walls and ceiling.

Photograph 12. Building 149 with visible fire damage and collapsing roof.

Photograph 13. START-2 collects bulk samples for asbestos analysis.

Photograph 14. START-2 collects wipe samples for PCBs inside Building 200 (radome).


Photograph 15. Typical bird nest inside damaged wall.


Photograph 16. Bird nest recovery.

Photograph 17. Abatement worker prepares an ACM pipe run for removal.

Photograph 18. Negative air enclosure for asbestos abatement at Building 155.


Photograph 19. Abatement workers prepare to remove a pipe with friable ACM.


Photograph 20. Abatement worker removes ACM floor tile from concrete slab.

Photograph 21. ERRS loads a tank covered with friable ACM into waste container.

Photograph 22. ERRS demolishes Building 105.


Photograph 23. Excavator with shears attachment demolishes Tank 804.


Photograph 24. Excavator with shears attachment demolishes Building 200 (radome).


Photograph 25. ERRS water truck suppresses dust near Building 155.


Photograph 26. View of site from the top of Building 200 (radome) during the RA.

Photograph 27. Asbestos workers wrap the cut end of ACM steam line.

Photograph 28. Excavator with shears attachment prepares to cut ACM steam line.

Photograph 29. ERRS excavates ACM steam line near the FAA facility.

Photograph 30. Asbestos worker wraps excavated ACM steam line.


Photograph 31. Air sampling pumps near area of asbestos abatement.


Photograph 32. Air sampling pump near demolition.

Photograph 33. ERRS excavates PCB-contaminated soil in foundation of Building 200.


Photograph 34. ERRS backfills the foundation of Building 200.


Photograph 35. ERRS lines an empty waste container for ACM demolition debris.


Photograph 36. ERRS loads ACM demolition debris into lined waste containers.

Photograph 37. ERRS separates scrap steel for recycling.

Photograph 38. Steel recycler consolidates scrap steel with metal crusher.


Photograph 39. Test plot area for small pieces of ACM debris, near Building 149.


Photograph 40. Close-up of Building 149 test plot, with small pieces of ACM debris.


Photograph 41. View of site to south, after removal action.


Photograph 42. View of site to north, after removal action.

This electronic version of the *Burns Asbestos Removal Action Report* does not include Appendices B through J.