



ASBESTOS MANAGEMENT PLAN

AIR FORCE RESEARCH LABORATORY – MESA RESEARCH SITE MESA, ARIZONA

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TABLE 1. GENERAL INFORMATION AND POINTS OF CONTACTS

Name of Installation	Air Force Research Laboratory - Mesa Research Site
Location of Installation	Chandler, Arizona
Type of Installation	Research and Development Laboratory
Hazardous Waste Management Organization	Installation Civil Engineering (AFRL/HEAO)

POINTS OF CONTACT (POC):		
Mission Support Branch (AFRL/HEAO)	Marcus Darling	(480) 988-6561, Ext. 168
Installation Civil Engineer (AFRL/HEAO)	Marcus Darling	(480) 988-6561, Ext. 168
Asbestos Management Plan	Vacant	(480) 988-6561, Ext. TBD
Asbestos Program Manager	Vacant	(480) 988-6561, Ext. TBD
Disaster Preparedness	Marcus Darling	(480) 988-6561, Ext. 168
Site Safety Officer (AFRL/HEAT)	Lt Dieffenderfer	(480) 988-6561, Ext. 384
Bioenvironmental Engineering (56 AMDS/SGPB, Luke AFB)	--	(623) 856-7521
Public Affairs Office (56 FW/PA, Luke AFB)	Lt Col Paradis	(623) 856-5853
Staff Judge Advocate (311 HSW/JA, Wright-Patterson AFB)	Al Nolting	(210) 536-8103
Security (AFRL/HEAO)	Rick Schildt	(480) 988-6561, Ext. 261
Contracting Officer (56CONS/LGCB)	Mary Peetz	(623) 856-9665
OTHER CONTACTS:		
Emergency Medical Care – Chandler Regional Hospital 475 South Dobson Road, Chandler, AZ 85224	--	(480) 728-3000 911 in case of emergency
Fire Department, City of Mesa – Station 215 5945 South Sossaman Road, Mesa, AZ 85212	--	(480) 644-2101 Non-emergency 911 in case of emergency
U.S. EPA Region IX Asbestos Coordinators	NESHAP Coordinator	(415) 972-3989
Arizona Department of Environmental Quality, Air Quality Compliance Section	NESHAP Coordinator	(800) 234-5677 (602) 771-2333
Maricopa County Air Quality Department	NESHAP Coordinator	(602) 506-6708

INSTALLATION IMPLEMENTING INSTRUCTION

Date: 20 April 2007

OPR: AFRL/HEAO

Subject: Air Force Research Laboratory - Mesa Research Site (AFRL/MRS), Asbestos Management Plan

References: Air Force Instructions (AFI) 32-1052, Title 40 Code of Federal Regulations Subpart M, Part 61

Purpose: To implement a comprehensive plan to manage items containing asbestos at the AFRL/MRS and ensure installation compliance with applicable federal, state, and Air Force asbestos regulations.

Applicability: The Asbestos Management Plan requirements apply to all Air Force and contractor personnel working at the AFRL/MRS.

Action: The AFRL/MRS Asbestos Management Plan became effective upon receipt and supersedes all previous AFRL/MRS Asbestos Management Plans.

Distribution: AFRL/HEA, AFRL/HEAE, AFRL/HEAO, AFRL/HEAS, AFRL/HEAT

Signature: _____ Date: _____
DANIEL R. WALKER, Colonel/USAF
Chief, Warfighter Readiness Research Division and
Commander, Mesa Research Site

SECURITY AND ADMINISTRATIVE INSTRUCTIONS

Title: The title of this document is the Air Force Research Laboratory-Mesa Research Site, Asbestos Management Plan and Asbestos Operating Plan. The plan will be referenced throughout this document as the AFRL/MRS Asbestos Plan.

Classification: This document is unclassified. It does not fall within the scope of directives governing the protection of information affecting National Security as specified in the AFI 31 series.

Responsibilities: AFRL/HEAO is the office of primary responsibility (OPR) and responsible for ensuring that installation personnel are aware of the AFRL/MRS Asbestos Plan and comply with its requirements.

Review/Changes: Review of the AFRL/MRS Asbestos Plan and any resulting amendments or changes must be logged on Table 2 and Table 3.

When amendments or changes significantly revise policies, procedures, or data presented in the Asbestos Plan, the Plan must be re-approved by AFRL/HEAO.

The AFRL/MRS Asbestos Plan is subject to revision if any applicable laws, regulations, or requirements are changed.

Components of the AFRL/MRS Asbestos Plan will be reviewed and updated annually to ensure that information contained herein is current. AFRL/HEAO will document reviews on the Plan Update Log (Table 2).

PLAN UPDATES & REVISIONS

Revisions reflect significant changes to the plan. Revisions can include format changes or changes due to significant revisions of policies, operations, and/or regulations. A revised plan must be submitted for review by organizations responsible for asbestos management and signed by AFRL/HEAO. An update reflects minor changes that are not a result of operational and/or regulatory changes or significant changes to the plan's format. For example, updates include a Point-of-Contact (POC) name change, or addition of annual metrics data. An update does not require review by organizations other than AFRL/HEAO and resubmission for signature by the Installation Commander.

Table 2: Plan Update Log

Reviewed By	Organization	Date Reviewed	Remarks

PLAN REVIEW

The Revised AFRL/MRS Asbestos Plan is submitted to installation organizations with Asbestos management responsibilities for review and comment. Organizations are to forward all suggested changes and comments to the OPR, AFRL/HEAO. The table below summarizes comments received by AFRL/HEAO for the current revision of the plan.

Table 3: Plan Review Log

Reviewed By	Organization	Date Reviewed	Remarks

ACRONYMS AND ABBREVIATIONS

AAC	Arizona Administrative Code
ACM	asbestos-containing material
ADEQ	Arizona Department of Environmental Quality
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AFP	Air Force Priority
AFRL	Air Force Research Laboratory
AHERA	Asbestos Hazard Emergency Response Act
ARS	Arizona Revised Statute
CAA	Clean Air Act
CFR	Code of Federal Regulations
DoD	Department of Defense
EPA	Environmental Protection Agency
FOIA	Freedom of Information Act
GRADE	Guidance for Rating and Assessing Damage and Exposure
HAZMAT	hazardous materials
HEA	Human Effectiveness Directorate
HEAO	Human Effectiveness Directorate, Mission Support Branch
HSA	homogeneous sampling area
JA	Judge Advocate
MRS	Mesa Research Site
NBS	National Bureau of Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NIOSH	National Institute of Safety and Health
NOV	Notice of Violation
O&M	operations and maintenance
OPR	Office of Primary Responsibility
OSHA	Occupational Safety and Health Administration
PACM	Presumed Asbestos Containing Materials
PCM	Phase Contrast Microscopy
PLM	Polarized Light Microscopy
PPE	Personal Protective Equipment
ppm	part per million
RAC	Risk Assessment Code
SOW	statement of work
TEM	Transmission Electron Microscopy

DEFINITIONS

ACM (Asbestos-Containing Material) - a material containing more than 1% asbestos as determined using U.S. Environmental Protection Agency- (EPA-) approved polarized light microscopy methods.

Asbestos - includes the minerals chrysolite, amosite, crocidolite, tremolite, anthophyllite, actinolite, and any of these minerals that have been chemically treated and/or altered.

Bulk sample - a solid quantity of insulation, floor tile, building material, etc., suspected of containing asbestos fiber and that would be analyzed for the presence, quantity, and type of asbestos.

Exposure assessment - an assessment conducted to determine if the potential exists for regulated exposure limits to be exceeded during an asbestos project.

Friable ACM - dry ACM that may be crumbled, pulverized, or reduced to powder by hand pressure.

Nonfriable ACM - dry ACM that cannot be crumbled, pulverized, or reduced to powder by hand pressure. Nonfriable asbestos is further divided into Category I (packings, gaskets, resilient floor covering, and asphalt roofing) and Category II (any non-friable material not in Category I).

PEL (Permissible Exposure Limit):

1. *Time-weighted average (TWA)* - The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter (0.1 f/cc) of air as an 8-hour TWA.
2. *Excursion limit* - The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1 f/cc as averaged over a sampling period of 30 minutes as determined by the method prescribed in 29 CFR 1926.1101 or the National Institute of Occupational Safety and Health (NIOSH) Method 7400.
3. *RACM (Regulated ACM)* - 1) Friable ACM; 2) Category I Nonfriable ACM that has become friable due to destructive handling; 3) Category I Nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or 4) Category II Nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation.
4. *Regulated area* - a demarcated area established by the employer where Class I, II, and III asbestos work is conducted; any adjoining area where debris and waste from such asbestos work accumulate; and a work area where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the PELs.
 - Class I Asbestos Work. Removal of thermal system insulation (TSI) or surfacing ACM. At a minimum, anyone engaged in Class I asbestos work must have, within the last year, attended a U.S. EPA approved Asbestos Abatement Worker Training Course, as set forth in 40 CFR Part 763, Subpart E, Appendix C. In addition, at least one person must be on site during working hours who has attended a U.S. EPA approved Asbestos Contractor / Competent Person / Supervisor Training Course, as set forth in 40 CFR Part 763, Subpart E, or in some other manner qualifies as a "competent person" as defined in 29 CFR 1926.1101(a). This training must be provided by a U.S. EPA accredited training facility and trainer.

- Class II Asbestos Work. Removal of ACM that is not TSI or surfacing. At a minimum, anyone engaged in Class II asbestos work must have, within the last year, attended a U.S. EPA approved Asbestos Abatement Worker Training Course, as set forth in 40 CFR Part 763, Subpart E, Appendix C. In addition, at least one person must be on site during working hours who has attended a U.S. EPA approved Asbestos Contractor / Competent Person / Supervisor Training Course, as set forth in 40 CFR Part 763, Subpart E, or in some other manner qualifies as a “competent person” as defined in 29 CFR 1926.1101(a). This training must be provided by a U.S. EPA accredited training facility and trainer.
- Class III Asbestos Work. Repair and maintenance operations where ACM including TSI and surfacing materials are likely to be disturbed. At a minimum, anyone engaged in Class III asbestos work must have attended, at a minimum, training equivalent in curriculum and training method to the 16-hour Operations and Maintenance course developed by U.S. EPA for maintenance and custodial workers who conduct activities that will result in the disturbance of ACM [40 CFR 763.92 (a)(2)]. Such a course should be at least sixteen hours in length, and must satisfy the requirements set forth in 29 CFR 1926.1101(k)(9). This training is not required to be provided by a U.S. EPA training provider and trainer; however the person providing the training should be, at a minimum, a California Certified Asbestos Consultant (CAC) or a Certified Industrial Hygienist (CIH).
- Class IV Asbestos Work. Maintenance and custodial activities that may impact ACM or which clean-up waste and debris containing ACM. At a minimum, anyone engaged in Class IV asbestos work must have received, at a minimum, awareness training in order that they understand asbestos hazards and be familiar with the asbestos in their building to avoid contact and disturbance of asbestos-containing materials. The training shall be conducted in accordance with the equivalent the U.S. EPA Asbestos Awareness Course for maintenance and custodial workers who work in buildings containing ACM [40 CFR 763.92 (a)(1)]. Such a course should be at least two hours in length. This training is not required to be provided by a U.S. EPA training facility and trainer; however the person providing the training should be, at a minimum, a CAC or CIH.

1.0 INTRODUCTION

1.1 PLAN PURPOSE AND SCOPE

1.1.1 Plan Purpose

The Air Force Research Laboratory – Mesa Research Site (AFRL- MRS) Asbestos Plan outlines organizational responsibilities and procedures that have been developed to protect facilities occupants from exposure to airborne asbestos fibers. The AFRL/Human Effectiveness Directorate, Mission Support Branch (HEAO) has the responsibility for implementing the AFRL/MRS Asbestos Plan. The AFRL/MRS Asbestos Plan has been prepared in accordance with Air Force Instruction (AFI) 32-1052, *Facility Asbestos Management*, March 1994, which requires the development of adequate procedures to manage existing asbestos-containing material (ACM) and Section 112 of the Clean Air Act (CAA), which established the National Emissions Standards for Hazardous Air Pollutants (NESHAP). NESHAP is intended to minimize the release of asbestos fibers through specific work practices during renovation, demolition, or other abatement activities when friable asbestos is involved. The CAA authorizes the United States Environmental Protection Agency (EPA) the responsibility for enforcement of regulations pertaining to renovations and demolition activities involving asbestos. The CAA also allows the U.S. EPA to delegate this authorization to state and/or local regulatory agencies. However, even after the U.S. EPA delegate responsibility to a state or local agency, they (EPA) retain the authority to oversee those agencies relating to their performance and enforcement of the NESHAP program. Within the state of Arizona the NESHAP program is enforced by federal (EPA), state Arizona Department of Environmental Quality (ADEQ), and county (Air Quality Department) NESHAP Coordinators. AFRL/MRS is located within Maricopa County, which has delegated authority from the EPA to enforce the NESHAP program within their jurisdictional boundaries and additional reporting requirements for planned demolition and renovation activities in addition to the Federal standards that are required.

Occupation Safety and Health Administration (OSHA) regulations Title 29 of the Code of Federal Regulations (CFR) Section 1910 (29 CFR 1910) and 29 CFR 1926 require that building owners and employers notify employees, tenants, and contractors of any asbestos hazards present in a facility and if the previous information changes. These same OSHA regulations also address the posting of labels warning of friable asbestos. Finally, training requirements for management and maintenance personnel are outlined in 29 CFR 1926.1101.

1.1.2 Plan Objectives

The objective of asbestos management planning is to ensure compliance with federal, state, local, and Air Force environmental and safety regulations and instructions regarding the handling and management of ACM. The focus of the plan is to:

- Define requirements for the effective management of asbestos at the AFRL/MRS, including specific tasks for meeting regulatory requirements and for protecting the health of facility personnel.
- Establish a system of identification, evaluation, and prioritization of suspected asbestos-related hazards so mitigation resources can be appropriated in a logical, cost-effective manner.
- Demonstrate compliance with regulatory and Air Force policy requirements concerning ACM by ensuring that organizational responsibilities are clearly and specifically defined.
- Establish a complete, usable, facility-specific database for recording information on ACM, and ensure that the database is kept current.

1.1.3 Confidentiality

The AFRL/MRS Asbestos Management Plan does not provide the general public with potentially sensitive information regarding missions or the facility. However, the public may request information in accordance with the Freedom of Information Act (FOIA). Responses will be provided in accordance with Air Force policy and FOIA requirements, to ensure proprietary and/or national security information remains confidential.

1.1.4 Plan Scope and Applicability

The AFRL/MRS Asbestos Management Plan limits its scope to the management of ACMs, and applies only to the AFRL/MRS. All military, civil service, and contractor personnel working at any of these facilities must adhere to the provisions of the AFRL/MRS Asbestos Management Plan. Responsibilities have been delegated to individuals and/or organizations as identified throughout the various sections of the AFRL/MRS Asbestos Management Plan.

Although this plan is limited to asbestos management issues, additional environmental protection plans (i.e., Hazardous Waste Management Plan, etc.) have been developed to address related environmental compliance, and management and contingency procedures. These plans have been referenced as appropriate to ensure consistency between plans.

1.2 INSTALLATION DESCRIPTION

The AFRL/MRS occupies approximately 7 acres in the City of Mesa, Maricopa County, Arizona, and is located approximately 25 miles southeast of downtown Phoenix. The AFRL/MRS is situated on a part of what was formerly Williams Air Force Base (now Williams Gateway Airport and Arizona State University- East Campus).

The installation houses the Warfighter Readiness Research Division of the AFRL's Human Effectiveness Directorate (HEA). This facility addresses integrated technologies and methods to improve mission readiness and is the Air Force's premier organization for research and development of war fighting training techniques and technologies. The directorate's mission is to research, develop, demonstrate, evaluate, and transition leading edge technologies and methods to train warfighters. The mission is accomplished by creating a collaborative working environment that brings together government, academia, and industry teams for the development of new technologies, applications, and environments that support the warfighter.

1.3 REGULATORY AND AIR FORCE POLICY OVERVIEW

In accordance with Air Force policy, AFRL/MRS facilities comply with federal, state and local regulations and Air Force/Department of Defense (DoD) instructions/directives. This section only lists those regulations most applicable to the management of asbestos. Other federal and state regulations, not identified below, regulate asbestos not governed by the AFRL/MRS Asbestos Plan such as storage, handling, and disposal of asbestos materials. Refer to the AFRL/MRS Hazardous Waste Management Plan (OPLAN 32-7042) for applicable hazardous waste regulations.

1.3.1 Federal Regulations

OSHA has established several standards to protect installation employees, including contract personnel, from exposure to asbestos.

- 29 CFR 1910.1200, *Occupational Safety and Health Standards, Hazard Communication*
- 29 CFR 1910.1001, *Occupational Safety and Health Standards, Asbestos*
- 29 CFR 1926.1101, *Safety and Health Regulations for Construction, Asbestos*

- 40 CFR 61, Subpart M, *NESHAP*
- 40 CFR 260-265, *Hazardous Waste Management Regulations*
- 40 CFR 302, *Designation, Reportable Quantities Notification*
- 40 CFR 373, *Reporting Hazardous Substance Activities When Selling or Transferring Federal Real Property*
- 40 CFR 141, *National Primary Drinking Water Standards*.

Construction work, as defined in 29 CFR 1910.12(b), is the primary activity at the AFRL/MRS that may present asbestos exposure issues to facility personnel. Construction activities include:

- Demolition or salvage of structures where asbestos is present
- Removal or encapsulation of materials containing asbestos.
- Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, containing asbestos
- Installation of products containing asbestos.

If asbestos is present, construction activities will require compliance with 40 CFR 61, which regulates the following:

- Fugitive emission from work sites
- Removal requirements before demolition
- Notification requirements before disturbance of ACMs.

1.3.2 Arizona Regulations

- Arizona Revised Statute (ARS) 49-421 et. seq., *State Air Pollution Control*
- ARS 49-471 et. seq., *County Air Pollution Control*
- Arizona Administrative Code (AAC) R18-2-1101(A)(8), *NESHAP*.
- AFOSH Citation

1.3.3 Air Force Instructions

- AFI 32-1042, *Solid and hazardous Waste Compliance*
- AFI 32-1052, *Facility Asbestos Management*
- AFI 32-7080, *Pollution Prevention Program*.

1.3.4 Mesa Research Site

- Mesa Research Site Hazardous Waste Management Plan (OPLAN 32-7042)
- Mesa Research Site Hazardous Materials (HAZMAT) Installation Operating Instruction.

1.4 RESPONSIBILITIES

1.4.1 Installation Commander (AFRL/MRS-HEA)

- Sets overall installation asbestos management policy
- Reviews and approves the AFRL/MRS Asbestos Plan and any changes made during annual reviews and updates.

1.4.2 Base Civil Engineer (AFRL/HEAO)

- Office of Primary Responsibility (OPR) for asbestos management.
- Approves all Civil Engineering manpower and financial resources necessary to execute the asbestos management program.
- Review and Updates the AFRL/MRS Asbestos Management Plan.
- Maintains records of ACM identified during facility surveys or other projects.
- Provides asbestos management guidance to installation organizations.
- Coordinates with federal, state, local regulatory agencies, and Air Force organizations regarding asbestos management (e.g., reports to regulatory agencies, headquarters, etc.).
- Coordinates sampling and analysis of potential ACM and waste streams.
- Ensures proper storage, labeling, documentation, transportation, and disposal of asbestos containing waste.
- Approves and signs Uniform Hazardous Waste Manifests and any other documentation required for asbestos disposal.
- Ensures that health-related criteria are considered in the prioritization and scheduling of asbestos abatement.
- Coordinates all asbestos abatement actions with organizations responsible for other aspects of the program.
- Ensures that in-house work orders, job orders, projects, and work to be accomplished are checked to determine if asbestos is present, exposed, or suspected.
- Coordinates training for base personnel, including contract personnel, involved in ACM management activities. Training includes asbestos identification and handling procedures.
- Will notify bioenvironmental engineering (56 AMDS/SGPB) immediately when damaged asbestos is discovered.
- Will notify Mission Support Branch (AFRL/HEAO) and Installation Commander (AFRL/HEA) within 24 hours of discovering an asbestos release.
- Will notify Staff Judge Advocate (311 HSW/JA) immediately in the event of asbestos regulation violations and/or known or suspected human exposures to asbestos.

1.4.3 Bioenvironmental Engineering (56 AMDS/SGPB)

- Coordinates with AFRL/HEAO on asbestos sampling and analysis.
- Provides input as to whether repair, maintenance, or removal of ACM is necessary.
- Performs bulk asbestos sampling, building surveys, or air sampling as required.
- Identifies the potential for human exposure to asbestos and determines whether extraordinary precautions, such as frequent monitoring, removal of personnel from the area, temporary controls, or other protective measures are necessary to protect personnel until recommended actions are completed.

- Assist AFRL/HEAO in determining potential health hazards when damaged asbestos is discovered or asbestos is released into the environmental.

1.4.4 Staff Judge Advocate (311 HSW/JA)

- Reviews all activities involving asbestos to ensure regulatory compliance and provides legal oversight.
- Coordinates on proposed base actions for compliance with applicable federal, state, local, and Air Force requirements.
- Reviews permit applications, regulator notifications, and/or applicable licenses required for the disposal of asbestos as required.
- Reviews inspections by federal, state, and local regulatory agencies (and inspection results); notices of violation (NOVs) issued by federal, state, and local agencies; and reports documenting known or suspected human exposures to asbestos.

1.4.5 Site Safety Officer (AFRL/HEAT)

- Assists AFRL/HEAO with physical safety concerns associated with the asbestos management program.
- Stays abreast of asbestos abatement activities and safety precautions, procedures, and policies related to the AFRL/MRS asbestos management program.

1.4.6 Public Affairs Office (56 FW/PA)

- Responsible for interfacing with the media and general public concerning asbestos-related incidents.

1.4.7 Contracting Officer (56 CONS/LGCB)

- Works closely with AFRL/HEAO to ensure contractors adhere to contract specifications and avoid non-compliance with asbestos regulations and Air Force Occupational Safety and Health (AFOSH) standards.
- Responsible for notifying contractors of non-compliance and stopping work that could potentially compromise the health and safety of facility personnel.

1.5 USE OF ASBESTOS

Asbestos is a naturally occurring mineral characterized by densely packed bundles of fibers. There are mainly six types of asbestos, the most common being chrysolite, amosite, and crocidolite. Asbestos became a very popular component in commercial grade products mostly due to its incombustible (i.e., fireproof), durability, and insulating properties. This is due to the chemical and physical properties that make up this mineral. Asbestos has been identified in over 3,500 materials typically used in the building/construction industry primarily for thermal insulation, fireproofing, and acoustical insulation. However, asbestos has also been used as a strengthening agent in concrete, floor tile, mortar, grout, and drywall spackling compounds.

Health Effects of Asbestos Exposure

Friable asbestos is the only asbestos that poses a health hazard. Friable ACM is defined as ACM that can be crumbled, pulverized, or reduced to powder by hand pressure (non-friable asbestos is not crumbled, pulverized or reduced to a powder by hand pressure). However, damage to non-friable ACM caused by an external disturbance (i.e., drilling, chiseling, etc.) can potentially release asbestos fibers to the air.

Individuals can be exposed to asbestos through dermal contact, ingestion, or inhalation. The greatest risk to health is inhalation of asbestos particles, followed by ingestion, and then dermal contact. Several health disorders have been identified as resulting from exposure to airborne asbestos fibers (e.g., lung cancer, asbestosis, etc.). The toxic effects of asbestos stem from particle size and shape more than chemical composition. All asbestos-related diseases have long latency periods of ten to forty years. Although not an immediate health risk, worker education is necessary to minimize unwarranted exposure.

Although dermal exposure to asbestos is not believed to produce dangerous or irreversible affect, protective clothing is highly recommended and should be used when working with or around asbestos. The purpose of protective clothing is to facilitate worker decontamination and prevent spread of fibers outside the work area, thereby exposing other individuals.

1.6 ASBESTOS IDENTIFICATION

Asbestos identification is accomplished using microscopic techniques. The analytical method used is a function of the type of sample submitted for analysis, either bulk or air.

Polarized Light Microscopy (PLM), an analytical method established by the National Bureau of Standards (NBS), is used to analyze bulk samples. PLM involves using dispersion staining to distinguish between the different types of asbestos present in a sample. Sensitivity of this method is one percent by weight, (1,000 parts per million [ppm]) and leads to the definition of an ACM. Samples containing more than one percent (1%) asbestos are considered ACM by federal and state standards.

Air samples are analyzed using either Phase Contrast Microscopy (PCM) or Transmission Electron Microscopy (TEM). PCM has limited sensitivity, making asbestos fibers difficult to distinguish from non-asbestos fibers. National Institute of Safety and Health (NIOSH) method 7400 is used to analyze air samples by PCM. Any fiber with a length to width ratio of 3:1 is considered to be an asbestos fiber when using PCM. TEM is used to distinguish between asbestos and non-asbestos fibers. TEM can detect particles orders of magnitude smaller than those seen using light microscopes.

Air samples are collected to monitor airborne asbestos fibers levels in a work area. Samples are collected using personal monitoring pumps or larger volume floor pumps. The samples are used to determine respiratory protection requirements for workers. Air sampling is also conducted following a response action or abatement project to determine if the work area has been sufficiently cleaned. NIOSH method 7400 is used to analyze both personal and clearance air samples.

2.0 GENERAL ASBESTOS POLICIES AND PROCEDURES

2.1 AIR FORCE ASBESTOS POLICY

ACM in Air Force facilities does not pose an imminent hazard unless it is friable, or is subjected to a mechanism or an event capable of breaking up ACM into individual fibers that become airborne.

Air Force policy as applied to the AFRL/MRS is to effectively manage non-friable ACM in place until a facility is demolished or renovated. All construction/demolition projects must be evaluated for ACM prior to beginning the project; damaged ACM or ACM that could become damaged during the project must be abated prior to, or as part of, the project.

The decision to remove damaged or friable ACM from a facility is based on the potential exposure risk to the facility occupants, use of the facility, feasibility of repairs, frequency of repair, and cost. When health and safety issues mandate the removal of ACM from a facility, asbestos abatement is given immediate priority.

2.2 AFRL/MRS ASBESTOS MANAGEMENT ACTIVITIES

Asbestos management activities at the AFRL/MRS include ensuring the health and safety of all AFRL/MRS employees through the elimination/reduction of ACM exposure in the workplace, as well as, the assessment, scheduling and planning, budgeting, contract monitoring, maintenance of files, and training of all activities associated with ACM.

2.3 ASBESTOS RECORD KEEPING REQUIREMENTS

Asbestos records consist of comprehensive information about all ACM at the AFRL/MRS. Records will be updated each time a survey, inspection, or surveillance is performed a facility with ACM is worked on or asbestos sampling is conducted. The AFRL/HEAO maintains and updates the installation asbestos records. These records are kept for a minimum of 30 years. Asbestos records are comprised of two components:

- Asbestos Files
- Asbestos Surveys.

2.4 ASBESTOS FILE

The AFRL/HEAO maintains a permanent file detailing asbestos activities, which includes the following:

1. ACM surveys completed.
2. Results of all sampling and testing performed, including bulk sampling and air monitoring.
3. ACM abatement contracts executed and a record of all contract documents including:
 - Certifications and licenses of contractor personnel conducting asbestos work.
 - Statements of Work (SOWs).
 - Results of all personnel and area air sampling.

4. Descriptions of all asbestos abatement activities performed, including but not limited to, dates work was performed, type of remediation, personnel involved, type and quantity of any ACM removed, disposal method and location, and results of post-control activity inspection/sampling.
5. Copies of notification letters sent to the U.S. EPA and the ADEQ, Air Quality Compliance Section.
6. Employee training records.
7. Copies of disposal documents, including copies of Uniform Hazardous Waste Manifests.
8. Copies of federal, state, local, and Air Force regulations concerning asbestos.
9. Other relevant reports, studies, and information necessary to comply with all appropriate federal, state, local, and Air Force regulations.

2.5 ASBESTOS SURVEYS

Managing asbestos requires identifying locations containing ACM, assessing its condition, determining whether it presents a health hazard, defining appropriate control activities, and ensuring that priority attention is given to areas posing the greatest health hazard.

The most effective method for identifying locations containing ACM and ascertaining their condition is through a comprehensive facilities survey. A comprehensive base-wide asbestos survey was performed at the AFRL/MRS in November and December 2006 by Asbestos Hazard Emergency Response Act (AHERA), 40 CFR 763, and Arizona Certified Building Inspectors. Table 4 provides a listing of the buildings surveyed and a summary of the 2006 survey results. Table 5 lists those buildings that were determined not to contain ACM, based upon the age and/or type of building construction, and therefore were not included in the survey. The specific ACM identified in each facility are presented in Appendix A.

Table 4: Asbestos Survey Results

Building	Contains ACM	Building	Contains ACM
551	No	561	Yes
552	Yes	562	No
554	No	564	No
558	Yes	567	No
560	Yes	570	Yes

Table 5: Buildings Not Surveyed Based on Age and Type of Construction

Building #	Description	Construction Date
Outdoor Pavilion	Covered Outdoor Picnic Area	2006

Asbestos Rating System and ACM Surveys

ACM surveys have not used the Air Force Asbestos Guidance for Rating and Assessing Damage and Exposure (GRADE) rating system described below. However, this system can easily be applied towards the 2006 ACM survey conducted at the AFRL/MRS by Earth Tech, Inc. (Earth Tech). The GRADE rating system for assigning an Air Force Priority (AFP) as follows:

- AFP 0: No Asbestos Identified.
- AFP 1: Immediate Removal. In terms of both damage and exposure potential, the situation warrants immediate removal in spite of the large potential for fiber release during abatement.
- AFP 2: Removal as Soon as Possible. Asbestos containing material should be removed as soon as possible, not waiting for the normal repair and maintenance cycle. In a school, for instance, removal should be accomplished during the summer or during recess periods. In a commercial building, it can be accomplished at night over a period of days. Prior to actual removal, it may be wise to limit access to that part of the building.
- AFP 3: Planned Removal. The hazard involved in these areas is such that removal should take place as part of the normal maintenance and repair cycle of a facility. This approach minimizes cost and disturbance.
- AFP 4: Repair. The most damaged areas should be repaired by encapsulation or replacement.
- AFP 5: Monitoring. Periodic monitoring of these areas should be planned to control, minimize and repair any future damage.
- AFP 6: No Immediate Action. Asbestos containing material is well protected and fiber release is very unlikely. No current action should be undertaken.

2.6 PLANNING AND SCHEDULING ACM ABATEMENT

2.6.1 In-house Work Requests

All work requests (AF form 332) received by AFRL/HEAO will be reviewed to determine if ACM is involved in the work request, or if it cannot be determined, AFRL/HEAO will have a survey performed to identify the presence of the ACM. If ACM is present and affects a work request, AFRL/HEAO will schedule asbestos abatement and inform the work requester.

2.6.2 Renovation Projects

For renovation projects AFRL/HEAO will consult the asbestos survey results or initiate a survey to determine if ACM is involved in a project. If ACM is found during the survey, abatement will be included in the renovation project scope.

2.6.3 Prioritizing Abatement Projects and Surveys

AFRL/HEAO will prioritize and schedule asbestos control activities and surveys based on project requirements and the hazards identified. Asbestos abatement will be scheduled in the following order:

Immediate Response:

- AFP 1 items: Damaged asbestos presents an immediate health hazard or mission impact (Risk Assessment Code [RAC] I & II).
- AFP 2 items: ACM is damaged and may present an immediate exposure risk (RAC III, IV & V).
- When otherwise immediate maintenance and repair is required.

Renovation/Repair Projects:

- AFP 3 items: Undamaged ACM does not present an immediate exposure risk (normally friable asbestos).
- AFP 4 items: ACM is not damaged and poses no threat as long as it remains undamaged.

2.6.4 Categorizing Survey Findings

AFRL/HEAO will categorize survey findings using the follow criteria:

- AFP 1: To be removed immediately.
- AFP 2: To be placed on schedule for abatement.
- AFP 3: To be removed when necessary.
- AFP 4: No action. Can remain in place.

2.6.5 Asbestos Control Options

Depending on the scope of the project, the potential health hazards identified, and regulatory or Air Force requirements, one of the following asbestos control options will be implemented:

- Maintain in place: ACM is undamaged and does not pose a risk of exposure.
- Enclosure: build or spray a resilient structure/coating around ACM designed to prevent disturbance and contain release of fibers.
- Encapsulation: seal, coat, or wrap ACM to prevent release of asbestos fibers.
- Repair damaged material containing asbestos.
- Removal.

2.7 REGULATORY NOTIFICATION

Requirements for U.S. EPA, state, and local abatement notification are to be included in all ACM abatement contracts as required. Proof of notification must be submitted to the Contracting Officer (56 CONS/LGCB) before the notice to proceed is issued. The state requires that the ADEQ be notified 10 working days prior to beginning renovation or demolition activities involving ACM.

2.8 ASBESTOS AWARENESS INFORMATION

General knowledge and awareness of asbestos conditions and activities is to be disseminated to all installation personnel. Methods of information dissemination include, but are not limited to, articles in the installation

newsletter, proper labeling, and during staff meetings. AFRL/HEAO is responsible for ensuring appropriate signs are placed anywhere there is a potential for an asbestos hazard.

2.9 TRAINING

It is likely that the only type of asbestos work AFRL/MRS employees should be doing is Class III and Class IV asbestos work. Class I and Class II work which involves removal activities should only be performed by an outside contractor who is properly trained and certified. According to OSHA 29 CFR 1926.1101, Class III asbestos work includes repair and maintenance operations where ACM and/or possible ACM are likely to be disturbed. Class IV work involves maintenance and custodial activities during which employees contact, but do not disturb ACM or presumed ACM (PACM), and activities to clean up dust, waste, and debris resulting from Class I, II, and III activities (see Definitions). For a worker to perform Class III work, he/she will need at a minimum 16 hours of asbestos awareness training in order to work without supervision. In order to perform Class IV work, a worker is required to receive a minimum 2 hours of training that includes location of ACM/PACM, asbestos-containing flooring material, or flooring material where absence of asbestos has not been certified, and instruction in recognition of damage, deterioration, and delamination of asbestos-containing building materials.

2.10 CONTRACT MONITORING

Abatement Contractor monitoring of personnel and area air monitoring by a certified industrial hygienist is required in all abatement contracts. Site inspections, reviews of abatement plans, and sampling plans will be conducted by AFRL/HEAO, with assistance from the 56 AMDS/SGPB.

Survey Contractor monitoring is performed by AFRL/HEAO, who assures the work is performed in accordance with the terms and scope of the survey contract. AFRL/HEAO also acts as coordinator between tenants and the contractor(s).

2.11 BUDGETING

The AFRL-MRS asbestos management program cannot be effectively implemented without adequate resources. AFRL/HEAO will prepare an annual budget for asbestos-related activities by September 30 of each year and submitted for approval. Allocation of funds for asbestos work should be based upon this budget. The budget should include funds for the following:

- Surveys.
- Sampling and analysis.
- Training.
- Contract abatement/monitoring.
- Incidental supplies.
- Fees for inspections, notifications, and disposal.

APPENDIX A

2006 AFRL/MRS FACILITY ASBESTOS SURVEY SUMMARY

Various asbestos-containing materials (ACMs) were identified during the facilities survey conducted at the Air Force Research Laboratory/Mesa Research Site (AFRL/MRS) in November and December, 2006 by Asbestos Hazard Emergency Response Act (AHERA) certified building inspectors. However, due to the building's recent construction, only a few friable ACM were identified. The most common ACM identified was non-friable, asbestos-containing flooring and flooring mastic. Asbestos content in sampled materials ranged from trace amounts (less than 1% by weight) in floor tile to 20% in pipe insulation. The Air Force Research Laboratory, Mesa Arizona - Asbestos Survey, Earth Tech, Inc 2006, will be maintained by AFRL/HEAO and contains all asbestos sampling results taken during the comprehensive survey. AFRL/HEAO also maintains information regarding all previous asbestos removal projects and analysis results of suspected ACM conducted at AFRL/MRS.

The 2006 Asbestos Survey determined that the ACM identified at AFRL/MRS facilities is in good condition and recommends management through normal operations and maintenance (Earth Tech, 2006). ACM in good condition receives an Air Force Priority (AFP) 3 (see Section 2.6.4) rating under the GRADE rating system. AFP 3 ACM is recommended for periodic monitoring to minimize damage to the ACM, therefore, precluding employee exposures to asbestos and remove when it is necessary.

A summary of ACM during the 2006 Asbestos Survey are presented below.

A.1 Building 551

No ACM was identified in Building 551.

A.2 Building 552

Table A.1: Building 552 Assessment

MATERIAL TYPE	PERCENT ASBESTOS	FRIABLE
Roof Mastic	7% Chrysotile	No

A.3 Building 554

No ACM was identified in Building 554.

A.4 Building 558

Table A.2: Building 558 Assessment

MATERIAL TYPE	PERCENT ASBESTOS	FRIABLE
12" White Floor Tile/Mastic	Tile – 2% Chrysotile Mastic – 5% Chrysotile	No
12" White Vinyl Flooring	Tile – 2% Chrysotile Mastic – None Detected	No
Pipe Elbow Wrap	Woven Mat. – None Detected Off-White Coating - 3% Chrysotile	Yes

A.5 Building 560**Table A.3: Building 560 Assessment**

MATERIAL TYPE	PERCENT ASBESTOS	FRIABLE
12" White Floor Tile/Mastic	Tile – Trace Chrysotile Mastic – 5% Chrysotile	No
Roof White & Black Mastic	2 – 5% Chrysotile	No

A.6 Building 561**Table A.4: Building 561 Assessment**

MATERIAL TYPE	PERCENT ASBESTOS	FRIABLE
Roof Mastic	7% Chrysotile	No
<p>Note: There was limited access throughout Building 561. Only the eastern half of the building was accessible, while the western half of the building was not accessible due to “top secret” activities performed in that area. Based on conversations with building personnel, it was understood by the asbestos sampling team that the suspect ACM sampled on the east side of the building are similar to those materials located on the west side of the building and not available for sampling. Therefore, additional bulk sampling and analysis may be required when renovation or demolition activities are performed in the western portion of Building 561.</p>		

A.7 Building 562

No ACM was identified in Building 562.

A.8 Building 564

No ACM was identified in Building 564.

A.9 Building 567

No ACM was identified in Building 567.

A.10 Building 570**Table A.5: Building 570 Assessment**

MATERIAL TYPE	PERCENT ASBESTOS	FRIABLE
Acoustic Ceiling Material	3% Chrysotile	Yes
Elbow Insulation	7 – 19% Chrysotile	Yes
Transite Wall Panels	Assumed	No

A.11 Outdoor Pavilion

Due to recent construction of this facility, no asbestos sampling was conducted at this facility.