HEALTH AND SAFETY PLAN

EVALUATION OF AN ALTERNATIVE ASBESTOS CONTROL METHOD FOR BUILDING DEMOLITION

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November 2005

HEALTH & SAFETY PLAN SIGNATURE PAGE

Date: November 2005

Project Name: Evaluation of an Alternative Asbestos Control Method for Building Demolition

Adopted by: _____ Date: _____
EQ Project Manager

Adopted by: _____ Date: _____
EQ Safety Manager

Adopted by: _____ Date: _____
U.S. EPA Representative

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TABLES

FIGURES

ACRONYMS

ANSI	-	American National Standards Institute
AOC	-	Area of Concern
APR	-	Air Purifying Respirator
ACGIH	-	American Conference of Governmental Industrial Hygienists
AST	-	Aboveground Storage Tank
BUI	-	Beneficial Use Impairment
CFR	-	Code of Federal Regulations
CGI	-	Combustible Gas Indicator
Clean Zone	-	Support Zone
COC	-	Chemical of Concern
CRZ	-	Contamination Reduction Zone
Decon	-	Decontamination
EQ	-	Environmental Quality Management
EZ	-	Exclusion Zone
FID	-	Flame Ionization Detector
GFCI	-	Ground Fault Circuit Interrupter
HASP	-	Health and Safety Plan
HAZWOPER	-	Hazardous Waste Operations and Emergency
Hot Zone	-	Exclusion Zone
IAW	-	In Accordance With
IDLH	-	Immediately Dangerous to Life & Health
MREM/HR	-	Milli-Roentgens Equivalent in Man per Hour
MSDS	-	Material Safety Data Sheet
NIOSH	-	National Institute for Occupational Safety & Health
OSHA	-	Occupational Safety & Health Administration
OVA	-	Organic Vapor Analyzer
PCB	-	Poly-Chlorinated Biphenyl
PEL	-	Permissible Exposure Limit
PID	-	Photoionization Detector
PPE	-	Personal Protective Equipment
PPM	-	Parts per Million
PRCS	-	Permit Required Confined Space
PRP	-	Potentially Responsible Party
QAPP	-	Quality Assurance Project Plan
RI	-	Remedial Investigation
SAR	-	Supplied Air Respirator
SCBA	-	Self-Contained Breathing Apparatus
SOP	-	Standard Operating Procedure

ACRONYMS (continued)

HASP	-	Health and Safety Plan
SSO	-	Site Safety Officer
STEL	-	Short Term Exposure Limit
SVOC	-	Semi-Volatile Organic Compound
SZ	-	Support Zone
TLV	-	Threshold Limit Value
TWA	-	Time Weighted Average
USACE	-	United States Army Corps of Engineers
U.S. EPA	-	U.S. Environmental Protection Agency
VOC	-	Volatile Organic Compounds
WNV	-	West Nile Virus

INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed for the Alternative Asbestos Control Method Project to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes. The procedures and guidelines contained herein were based upon the best available information at the time of the plan's preparation. Specific requirements will be revised when new information is received or conditions change. A written amendment will document all changes made to the plan. Any amendments to this plan will be included in Appendix A. Where appropriate, specific OSHA standards or other guidance will be cited and applied.

All work practices and procedures implemented on site must be designated to minimize worker contact with hazardous materials and to reduce the possibility of physical injury. All work will be performed in accordance with applicable Federal 29 CFR 1910 and 1926 Health and Safety Regulations and specifically 29 CFR 1910.120 Hazardous Operations and Emergency Response.

Daily Safety Meetings

Daily safety meetings will be held at the start of each shift to ensure that all personnel understand site conditions and operating procedures, to ensure that personal protective equipment is being used correctly, and to address worker health and safety concerns.

Site Safety Plan Acceptance/Acknowledgment

The Project Manager or designated government representative shall be responsible for informing all individuals entering the Exclusion Zone (EZ) or Contamination Reduction Zone (CRZ) of the contents of this plan and ensuring that each person signs the Health and Safety Plan (HASP) Acknowledgment Form. By signing the HASP Acknowledgment Form, an individual acknowledges he/she recognizes the potential hazards present on site and the policies and procedures for minimizing the exposure or adverse effects of these hazards.

SECTION 1

PROJECT TASK/ORGANIZATION

1.1 Project Organization

The U.S. EPA's Office of Research and Development (ORD) and U.S. EPA Region 6 are cooperatively conducting this research project. Environmental Quality Management, Inc. (EQ) is the prime contractor on the project and will have overall responsibility to ensure that the project is conducted in accordance with the approved Quality Assurance Project Plan (QAPP). MVA Scientific Consultants, Inc. (MVA), Reservoirs Environmental, Inc. (REI), and Lab/Cor, Inc., will perform the primary laboratory analyses of the samples. RTI International will perform the independent quality control analyses of the samples. QuanTech, Inc., will assist EQ in preparing the study design and will perform the statistical analysis of the data.

The overall project organization is presented in Figure 1-1. It graphically shows the functional organization structure and lines of communication for this project. The project structure along with the technical personnel selections are designed to provide efficient management and a high level of technical competence to accomplish this research project. The roles and responsibilities of key project personnel are summarized in Table 1-1.

1.2 Problem Definition/Background

1.2.1 Background

The Clean Air Act provides the EPA with the authority to promulgate a "*work practice standard*" if it is not feasible to establish an emission standard. Under Section 112 of the Clean Air Act, asbestos is determined to be a hazardous air pollutant and is regulated under EPA's asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61, Subpart M.

TABLE 1-1. ROLES AND RESPONSIBILITIES OF KEY PROJECT PERSONNEL

Personnel	Role and Responsibility
Roger Wilmoth, U.S. EPA, ORD, NRMRL	*Co-Program Managers*, will have overall administrative and technical responsibility for this project.
Mark Hansen, U.S EPA, Region 6	
Glenn Shaul, U.S. EPA, ORD, NRMRL	*Task Order Manager (TOM)*, will direct the project and ensure that it is proceeding on schedule and within budget. Point of contact for EQ.
David Eppler, U.S EPA, Region 6	*On-Site Enforcement Officer*, will provide technical direction (as needed) to the EPA TOM. Point of contact for Fort Chaffee ReDevelopment Authority.
Lauren Drees, U.S. EPA, ORD, NRMRL	*QA Officer*, will provide QA oversight to ensure that the planning and plan implementation are in accordance with the approved QAPP. In addition, will direct a field audit of the demolition and landfill sites, and laboratory audits of MVA and REI.
John Kominsky, EQ	*Project Manager*, will have overall administrative and technical responsibility for EQ and its sub-contractors to ensure that data collection and analysis and the technical report meet the planned study objectives. Maintain close communication with the EPA TOM. Ensure that the project is completed in accordance with the approved QAPP and all personnel fully understand the QAPP.
Jackie Doan, EQ	*QA Manager*, will review and approve the QAPP. Provide overall QA oversight and coordination to ensure acceptable data collection, recovery, and analysis.
David Cox, QuanTech	*Statistician*, will assist EQ's Project Manager with developing the study design, perform sample size calculations, and perform the statistical analysis of the data.
James Millette, MVA	*Microscopist*, will provide primary laboratory analysis of asbestos air samples [transmission electron microscopy (TEM) and phase contrast microscopy (PCM)].
Jeanne Orr, REI	*Microscopist*, will provide primary laboratory analysis of asbestos soil and water samples (TEM). REI staff will provide laboratory analysis of air and soil samples for inorganic lead.
John Harris, Lab/Cor	*Microscopist*, will generate and provide the primary laboratory asbestos analysis of the soil elutriation samples (TEM).
Mike Beard, RTI Owen Crankshaw, RTI	*Chemist/Microscopist*, will direct/provide independent quality control (QC) analysis of selected air and soil samples (TEM) collected for asbestos. Owen Crankshaw will perform an on-site laboratory audit of MVA, REI, and Lab/Cor.

The asbestos NESHAP (*a work practice standard*) requires the removal of all regulated asbestos-containing material (RACM)[1] prior to demolition of the facility. The asbestos NESHAP specifies emission control procedures [§61.145(c)] and waste disposal requirements [§61.150] that must be followed during demolition of a facility that contains asbestos above the threshold amount.[2] Section §61.150 of the asbestos NESHAP requires owners to "discharge no visible emissions to the outside air" during demolition and renovation activities. If a facility is being demolished because it is structurally unsound and is in danger of imminent collapse, RACM is not removed prior to demolition, but the RACM must be kept adequately wet during demolition. All of the contaminated debris must be kept adequately wet until disposal and must be disposed of as ACM.

Asbestos removal in accordance with the asbestos NESHAP can account for a significant portion of the total demolition cost. In many cities, the cost of pre-demolition asbestos removal prohibits the timely demolition of substandard structures that are not in danger of imminent collapse but which, if left standing, could become structurally unsound over a period of years.

These abandoned substandard structures can be a haven for illegal activities (such as vagrants, illegal drug use, theft of salvageable materials), and enhance urban blight. Reportedly, a common practice among municipalities is to allow abandoned structures to decay to the point of collapse prior to demolition due to the expense of NESHAP abatement.

The EPA will perform a controlled demonstration to evaluate the equivalency of the Alternative Asbestos Control Method to the NESHAP Method. The alternative method, if successful, would likely accelerate the demolition of many abandoned buildings around the nation that remain standing and currently present a variety of potentially serious risks to nearby residents. Through the use of the Alternative Asbestos Control Method, these former blighted areas would then be available for redevelopment, thereby creating jobs and tax revenues for communities.

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[1] Under asbestos NESHAP, RACM means friable asbestos material; Category I non-friable ACM that has become friable; or Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by forces expected to act on the material in the course of demolition.

[2] Asbestos NESHAP [§61.145(a)] requires that if the following amounts of RACM are present in a facility, these materials must be removed prior to demolition: (1) At least 260 linear feet on pipes; or (2) at least 160 square feet on other facility components; or (3) where the amount of RACM on pipes or other components could not be measured before stripping, a total of at least 35 cubic feet from all facility components in a facility being demolished.

The Alternative Asbestos Control Method requires that certain RACM (such as thermal system insulation and fireproofing) be removed before demolition in accordance with the Asbestos NESHAP Method, and other RACM (such as wallboard joint compound, resilient flooring/mastic, glazing compound) not be removed. The alternative method varies from the existing Asbestos NESHAP Method in the use of an amended-water wetting process, type of demolition equipment, and demolition techniques. Once the required RACM is removed, the demolition proceeds using amended water suppression before, during, and after demolition to trap asbestos fibers and minimize the potential release to the air. The RACM is less likely to become friable when the wetting process and demolition techniques specified in the alternative method are used. Wastewater generated during the demolition is collected and filtered, and all debris is disposed of as asbestos-containing waste.

The purpose of this research project is to compare the environmental and cost-effectiveness of the Alternative Asbestos Control Method vs. the current Asbestos NESHAP Method through a side-by-side comparison of the demolition of buildings that are architecturally identical in composition and structure. Demonstration of the Alternative Asbestos Control Method will assist EPA in evaluating existing demolition practices of the Asbestos NESHAP Method with the potential of improving environmental compliance if the Alternative Method is found to be equivalent or superior to existing regulations.

1.3 Objectives

The goal of this research study is to determine if the Alternative Asbestos Control Method is "***equivalent***" to the current asbestos NESHAP demolition practice. This means that the releases of asbestos to the air and to the soil are not greater in the case of the Alternative Method than those of the NESHAP Method. In addition, the cost of the Alternative Method must be less than the NESHAP Method for the Alternative to be attractive. To assess these factors, the following primary objectives will guide the design and implementation of the research effort and will be used, with appropriate consideration of the impact and influence of data from the listed secondary objectives, to assess equivalency. Judgment needs to be used in the consideration of factors other than the primary objectives in clarifying the overall environmental conditions that result from the application of each demolition technique.

1.3.1 Primary Objectives

1. To determine if the airborne asbestos (TEM) concentrations from the Alternative Method are statistically equal to or less than concentrations from the NESHAP Method.

2. To determine if the post-excavation asbestos concentrations in the soil from the Alternative Method are statistically equal to or less than concentrations from the post-demolition NESHAP Method.

3. To determine if the Alternative Method is more cost-effective than the NESHAP Method considering all costs, including disposal of all asbestos-contaminated materials and soils.

1.3.2 Secondary Objectives

The following secondary objectives will provide additional information to further characterize the interrelationships among several multimedia parameters to enhance the understanding of the process and to further the science:

AIR

1. To determine background asbestos concentrations (TEM) prior to the NESHAP Abatement and again prior to the Alternative Demolition.

2. To determine if the airborne fiber (PCM) concentrations from the Alternative Method are statistically equal to or less than the concentrations from the NESHAP Method.

3. To document visible emissions during both demolitions.
4. If wind conditions allow, to determine if the airborne asbestos concentrations upwind are statistically equal to or less than the downwind concentrations for the Alternative Method.

5. If wind conditions allow, to determine if the airborne asbestos concentrations upwind are statistically equal to or less than the downwind concentrations for the NESHAP Method.

DUST

6. To determine if the asbestos concentrations in the settled dust (TEM) from the Alternative Method are statistically equal to or less than the concentrations from the NESHAP Method.

WORKER

7. To determine if worker fiber exposure concentrations (PCM) from the Alternative Method are statistically different than the concentrations from the NESHAP Method.

8. To determine if worker asbestos exposure concentrations (TEM) from the Alternative Method are statistically different than the concentrations from the NESHAP Method.

ACTIVITY

9. To document worker asbestos exposure concentrations (TEM) for individuals that are maintaining the perimeter air monitoring network.

SOIL

10. To determine if the asbestos concentration in the post-excavation soil from the Alternative Method is statistically equal to or less than the pre-demolition asbestos concentration.

11. To determine if the asbestos concentration in the post-demolition soil from the NESHAP Method is statistically equal to or less than the pre-demolition asbestos concentration.

12. To determine if asbestos concentration in the post-excavation soil is statistically different than the concentration in the post-demolition soils from the Alternative Method.

13. To determine if asbestos concentrations from elutriator tests on the post-excavation soils from the Alternative Method are statistically equal to or less than the concentrations from the post-demolition NESHAP Method.

14. To determine if asbestos concentrations from elutriator tests on the post-excavation soils from the Alternative Method are statistically equal to or less than the pre-demolition concentrations.

15. To determine if asbestos concentrations from elutriator tests on the post-demolition soils from the NESHAP Method are statistically equal to or less than the pre-demolition concentrations.

16. To determine if asbestos concentrations from elutriator tests on the post-excavation soil are significantly different than the concentrations from tests on the post-demolition soil from the Alternative Method.

WATER

17. To measure the asbestos concentrations in the water applied to control emissions from both the Alternative and NESHAP Methods and to measure the asbestos concentrations in collected water for both processes during demolition activities.

LANDFILL

18. To determine background airborne asbestos concentrations (TEM) prior to landfilling of the NESHAP Method Building debris and again prior to landfilling of the Alternative Method Building debris.

19. To determine if the airborne asbestos concentrations at the landfill (TEM) during disposal of the Alternative Method debris are statistically equal to or less than the concentrations during disposal of the NESHAP Method debris.

20. To determine airborne asbestos concentrations at the landfill (TEM) during disposal of the asbestos-containing materials (ACM) removed prior to demolition of the NESHAP Method Building.

21. To determine if landfill worker fiber exposure concentrations (PCM) from the Alternative Method are statistically different from concentrations from the NESHAP Method.

22. To determine if landfill worker asbestos exposure concentrations (TEM) from the Alternative Method are statistically different from concentrations from the NESHAP Method.

TIME

23. To document the time required for all activities related to the demolition by the Alternative Method and for the NESHAP Method, including abatement.

MODELING

24. To collect additional asbestos, fiber, and dust data necessary for potential future air dispersion modeling efforts.

1.4 Regulatory Requirements for Lead

In addition, worker exposure sampling will be conducted for lead in accordance with 29 CFR §1926.62, which applies to all abatement, demolition, and land filling activities involved in this study.

SECTION 2

SAFETY AND HEALTH HAZARDS

2.1 Chemical Hazards

Appendix C, Chemical Hazard Information, contains generic Material Safety Data Sheets (MSDSs) for anticipated materials. This listing should not be taken as a complete assessment of the hazards posed by materials at the Alternative Asbestos Control Method Project. Therefore, personnel must be alert for symptoms of possible exposure such as unusual smells; stinging or burning eyes, nose, or throat; skin irritation; and feeling extremely well, depressed, sleepy, or tired. Symptoms must be immediately reported to the Project Manager and/or site safety officer.

Potential exposure to the following chemical hazards during project operations may be encountered:

- Asbestos
- Lead

2.2 Physical Hazards

General physical hazards associated with site operations that will be conducted in many areas of the Alternative Asbestos Control Method Project industrial grounds include, but are not limited to: heat/cold stress; elevated noise levels; slips, trips, and falls; possible confined space entry; and electrical hazards, water hazards, and hazards associated with lifting or carrying. Anticipated physical hazards are discussed below.

2.2.1 Heavy Equipment Hazard

Heavy equipment use could result in an impact or crushing injury. All nonessential workers will be required to stay a minimum of 20 feet beyond maximum equipment swing or movement areas. The use of hard hats, safety shoes, and safety glasses is mandatory when working on or around heavy equipment. Some instances may also require the use of hearing protection.

2.2.2 Cold/Heat Stress

Extreme cold for a short time may cause severe injury to the surface of the body. Areas of the body that have a high surface-area-to-volume ratio such as fingers, toes, ears, and nose are the most susceptible. In the winter months, persons working in cold temperatures pose an occupational hazard.

In contrast, heat stress is usually a result of PPE usage coupled with high temperatures during hazardous waste operations. Protective clothing and respirators decrease natural body ventilation, which is essential to keeping the body temperature controlled. Although heat stress can manifest any time work is performed in elevated temperatures, the potential for heat stress to affect workers utilizing PPE is magnified. Heat stress is one of the most common and potentially serious illnesses; regular monitoring and other preventive measures such as time restrictions and constant hydration are vital.

See Appendix I for further information on cold/heat stress.

2.2.3 Elevated Noise Levels

During on-site activities requiring the use of power equipment, hearing protection may be required to be worn for certain tasks or in designated areas where noise levels reach $\geq$ 85 dBA. Training on proper use of hearing protection will be conducted prior to initiation of specified on-site work.

2.2.4 Manual Lifting

The human body is subject to severe damage in the form of back injury and/or hernia if caution is not observed in the handling process. General rules for minimizing injuries from manual lifting are:

- Get good footing.
- Place feet shoulder width apart.
- BEND AT KNEES to grasp object.
- Keep back straight.
- Get a good grip on object.
- Lift gradually by straightening the legs.
- GET HELP if object is too heavy for you to lift (usually 50-60 lbs lifting limit).

2.2.5 Falls and Fall Protection

Falls are a leading cause of occupational fatalities. These fatalities are considered preventable with the use of fall protection systems. The following is a list of common fall hazards:

- Elevated work at $\geq$ 6 feet above lower level with unprotected sides or edges
- Wall openings $\geq$ 4 feet above lower level
- Floor/Roof openings (hatches)
- Floor/Roof holes (deterioration), i.e. failing roof
- Ramps, walkways, bridges
- Excavations

Protection from fall hazards can be achieved in one of three ways: 1) fixed position systems, 2) personal fall protection, and 3) safety monitoring systems. A combination of these three protection systems is often used to ensure the safety of site workers. Fixed position systems consist of guardrails, safety nets, and floor covers. Personal fall protection will consist of a full-body harness with a 6-foot shock-absorbing lanyard. Good housekeeping, proper PPE, and daily safety meetings can minimize injuries from falls.

2.3 Biological Hazards

During performance of work activities, certain biological hazards may be encountered. Poisonous plants, insects, and vermin are anticipated at the Alternative Asbestos Control Method Project.

Poisonous vegetation such as poison ivy is present throughout Arkansas. Physical contact with these types of poisonous vegetation should be avoided. Exposure to such plants can result in dermatitis and skin irritation.

Insect stings are another biological hazard that may be encountered. Personnel with known allergic reactions to insect stings should have their physician-prescribed emergency sting-kits on site and also inform the Site Safety Officer (SSO) of their allergy to insect bites/stings.

Tick bites and the possible onset of Lyme disease are another biological concern. Please follow the following guidelines for tick removal:

- Avoid handling ticks with uncovered fingers; use tweezers or commercial tools designed for removal. If index finger and thumb must be used, protect them with rubber gloves, plastic, or even a paper towel.

- Place tips of tweezers or edges of other removal devices around the area where the mouthparts enter the skin.
- With a steady slow motion, pull the tick away from the skin or slide the removal device along the skin. DO NOT jerk, crush, squeeze or puncture the tick.
- After removal, place the tick directly into a sealable container. Disinfect the area around the bite site using standard procedures (soap and water).
- Keep tick alive for a month in case symptoms of a tick-borne disease develop. Place it in a labeled, sealed bag or vial with a lightly moistened paper towel stored around 40 degrees.

West Nile virus (WNV) is a mosquito-born virus that can cause encephalitis or meningitis, via the bite of an infected mosquito. An insect repellent containing DEET should be used (30 % DEET is usually good for 4-5 hours of protection when working outdoors.)

Avoid prolonged or excessive use of DEET, and use it sparingly to cover skin and clothing. Always follow manufacturer's instructions. See Appendix P.

2.4 Radiological Hazard

No radiological hazards are anticipated at the Alternative Asbestos Control Method Project.

SECTION 3

PERSONNEL TRAINING

EQ will conduct a variety of training programs and related activities to ensure the protection of workers and the general public, and to prevent accidents at the work sites. Training of site workers, supervisors, government personnel, deliverymen, emergency response personnel (law enforcement, fire, EMT, etc), and visitors is an extremely important task in ensuring the project is performed in the safest manner possible. The overall training program has four major components: 1) training for a specific job category (e.g., electrician, equipment operator), 2) general hazardous waste site training (HazWoper), 3) site-specific initial orientation training (review of the HASP), and 4) ongoing site-specific training (daily safety meetings, review of procedures, etc.). Each covers a certain aspect of worker activity. Together, they form a comprehensive training program designed to ensure all site participants (e.g., workers, supervisors, and observers) are trained to perform their tasks in the safest manner possible.

Three general types of personnel are expected to enter the site: Active, Passive, and Routine. Active site personnel, site workers, supervisors, government personnel, security personnel, etc., will have all four types of training identified above.

Passive site personnel, equipment and supply deliverymen entering the site, visitors on site less than 72 hours, and emergency response personnel will not be authorized to enter the exclusion zone. Active site personnel will escort passive site personnel while they are on site. It should be noted that EQ has established cooperative agreements with local emergency response personnel. EQ will provide requested site-specific information (HASP, MSDS, etc.) and will provide customized training. Under routine circumstances, these personnel will be treated as normal passive site personnel. In the event of a life-threatening situation, however, they will assume control of the site. EQ will provide requested assistance, but will not be the authority in charge. Appropriate safety and health procedures will be at the direction of the emergency response personnel.

Routine delivery personnel (U.S. mail, FedEx, etc.) will make routine deliveries to the office trailers. These personnel will not be required to comply with any of the training requirements, provided they do not proceed past the support zone.

3.1 EQ Employee Initial Training

All training complies with 29 CFR 1910.120(e). Initial training includes 40-Hour HAZWOPER training.

3.2 Site-Specific Training

Site-specific training is as follows:

- All assigned personnel will receive site-specific training on routes of exposure and adverse health effects associated with the chemicals listed in Section 2.2 (including MSDSs in Appendix C).
- At least one member of each work crew shall have training in the use of portable fire extinguishers in accordance with 29 CFR 1910.157(g).
- As specified in 29 CFR 1910.120, all personnel newly assigned to the project will receive 3 days of on-the-job training by an experienced supervisor.
- Each person entering the site shall sign a statement attesting to the fact that he/she has read and understands this Site Safety Health Plan. (See Appendix Q for HASP Acknowledgment Form.)

3.3 Annual Refresher

All EQ field employees receive 8 hours of refresher training (or equivalent) on the above topics within the anniversary date of their initial 40-hour class.

3.4 First Aid/CPR

At least one individual on site will maintain valid and current CPR and First Aid Certification. Treatment will be limited to Good Samaritan/minor first aid. All traumatic/major first aid and cardiac problems will be referred to medical facilities.

3.5 Subcontractor Requirements

All subcontractors entering the Contamination Reduction Zone and Exclusion Zone will have adequate training pertaining to their specific task(s).

SECTION 4

PERSONAL PROTECTIVE EQUIPMENT

Employees shall wear clothing suitable for weather and work conditions. The minimum for fieldwork shall be Level D (hardhat, steel toed safety boot, and safety glasses). Excessively long or baggy pants are prohibited. Based on historical data and work plan procedures, potential for exposure to chemical and/or radiological hazards is low. Physical hazards are the main area of concern thus denoting Level D PPE proper level of protection for Alternative Asbestos Control Method Project activities.

(A brief description of the personal protective equipment (PPE) is included in Appendix D. The U.S. EPA terminology for protective equipment will be used: Levels A, B, C, and D).

4.1 Level A

Level A PPE is not an anticipated level of protection for this project

4.2 Level B

Level B PPE is anticipated level of protection for this project during gross removal (demolition) and gross clean-up (type C supplied air).

4.3 Level C

Level C PPE is anticipated level of protection for this project only when demolition preparations work and final wipe-down work is being conducted.

4.4 Level D

Level D protection shall be used.

- The atmosphere contains no known respiratory hazard; and

- Work functions preclude splashes, immersion, or the potential for unexpected inhalation of, or contact with, hazardous concentrations of harmful chemicals.

Level D protection equipment, at a minimum, shall consist of:

- Rain Suit - as necessary
- Safety Shoes/Boots (type) - Steel-toe/Steel Shank
- Boot Covers (booties) - Latex
- Work Gloves - Cotton
- Hard Hat
- Face Shield - as necessary
- Safety Glasses
- Modifications: Hearing protection as required by noisy operations
- Polytyvek^{TM} coveralls and Viton or Nitrile gloves when working and the possibility of a splash exist.

Level D PPE is the desired level of protection to be utilized during all site activities not involving potential exposure to lead and or asbestos. .

4.5 PPE

Decisions to upgrade/downgrade PPE are as follows:

- All decisions to upgrade / downgrade PPE must be accompanied by air monitoring results. Appropriate personnel must be advised of on-site decisions to downgrade. All decisions must be documented with an amendment to the HASP.

- The following conditions will necessitate reevaluation of PPE use.

  - Commencement of a new work activity not previously identified
  - Change of job tasks during a work phase
  - Change of season/weather
  - Use of contaminants other than those identified in Safety Plan
  - Change in ambient levels of contaminants
  - Change in work that affects degree of chemical contact

- Site Action Levels breeched

SECTION 5

MEDICAL SURVEILLANCE

5.1 Pre-Employment Physical

Pre-employment and periodic update medical examinations are required for persons working at hazardous waste sites. All physicals must be completed and documented prior to assignment to the site. All physical exams will be conducted following parameters established by the respective employee's corporate physicians. EQ and all permanent team subcontractors must adhere to the Drug Free Workplace Act of 1988.

5.2 Site-Specific Physical Examination

A current Fitness for Duty statement will be kept on site for all personnel except for personnel who will visit the site in an infrequent and passive manner. However, personnel visiting the site in an infrequent but more dynamic manner (potential for exposure to site contaminants etc..) are required to have Fitness for Duty statement on file in the command post.

5.3 Annual Physical Exam

A medical examination must have been completed within a 12-month period prior to on-site activity and repeated annually.

5.4 Accidental/Suspected Exposure

Following any accidental or suspected uncontrolled exposure to site contaminants, personnel should be scheduled for a special physical examination. The physical examination will be specific for the contaminants and the associated target organs or physiological system. Exposure to blood/body fluids requires adherence to 29 CFR1910.1030 (Bloodborne Pathogens). Questions regarding the type of physical can be directed to the employer's Director of Health and Safety or its corporate physician.

5.5 Contractor Physical Examination Requirements

All subcontractors entering the Contamination Reduction Zone or Exclusion Zone will have adequate medical surveillance satisfying 29 CFR 1910.120(f).

5.6 Site Documentation

All personnel on the project site must have all applicable certifications / documentation easily available.

SECTION 6

AIR MONITORING

According to 29 CFR 1910.120 (h), air monitoring shall be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection needed on site.

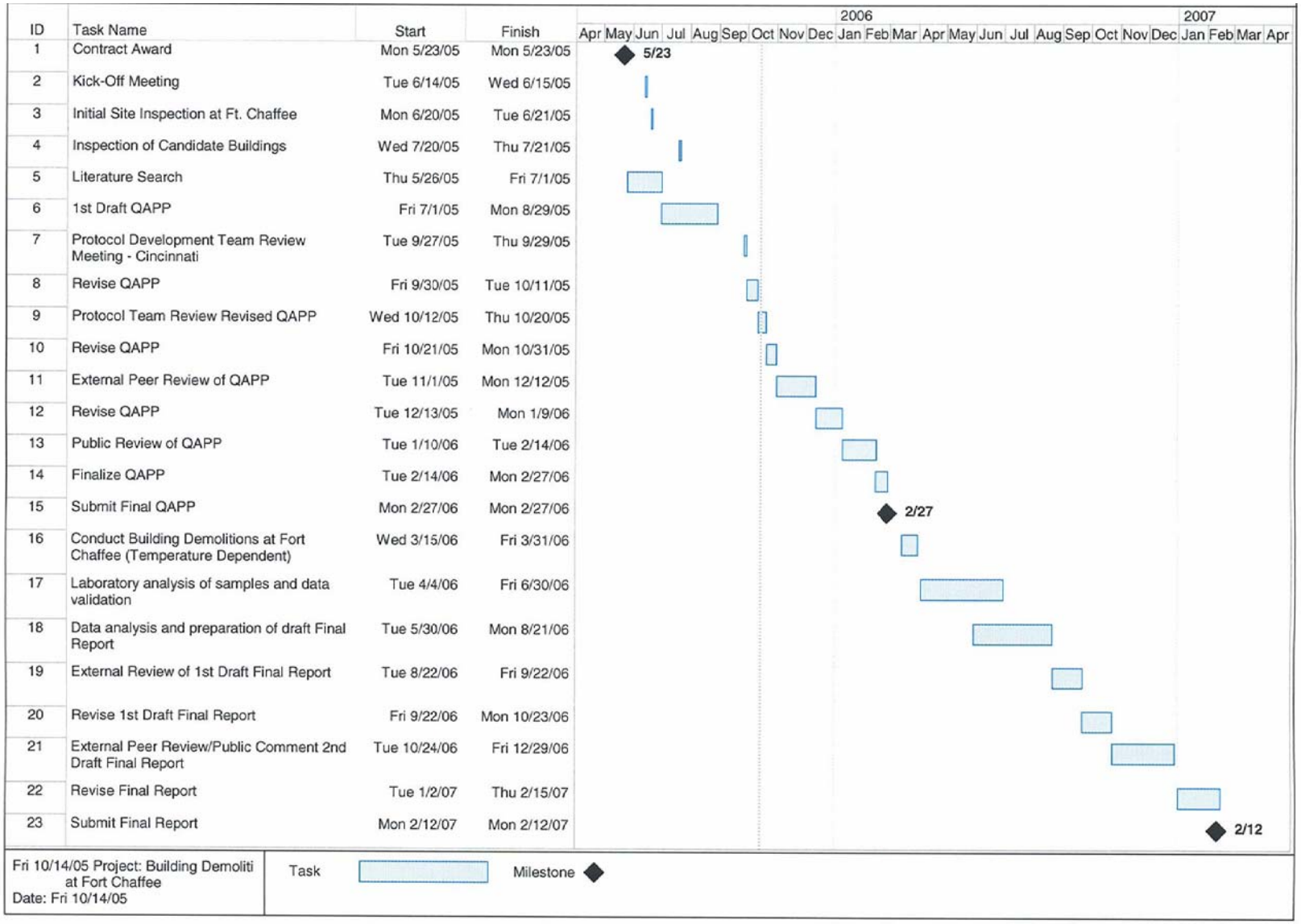
6.1 Routine Air Monitoring Requirements

Routine air monitoring is required:

- Upon initial entry to rule out IDLH conditions
- When the possibility of an IDLH condition or flammable atmosphere has developed
- When work begins on a different portion of the site
- When contaminants other than those previously identified are being handled
- When a different type of operation is initiated
- When employees are handling leaking drums or containers or working in areas with obvious liquid contamination
- During confined space work.

6.2 Environmental Monitoring During Demolition of Buildings

An analysis was conducted of 3,660 hours of meteorological data (wind direction and wind speed) collected between 07:00 to 18:00 hours from March 1 through April 30 during the years of 1999, 2000, and 2002 through 2004 at the Fort Smith Municipal Airport (Station #13964). The demolition study is projected to be conducted during March 2006; see Figure 6-1. The wind direction varied between up to six 20-degree sectors during a given day. Hence, it was concluded that the primary air sampling design should be based on a concentric ring approach rather than on an upwind to downwind approach This study design is consistent with the primary objective of this project: i.e., to evaluate the equivalency of the Alternative Asbestos Control Method to the Asbestos NESHAP Method.



ID	Task Name	Start	Finish
1	Contract Award	Mon 5/23/05	Mon 5/23/05
2	Kick-Off Meeting	Tue 6/14/05	Wed 6/15/05
3	Initial Site Inspection at Ft. Chaffee	Mon 6/20/05	Tue 6/21/05
4	Inspection of Candidate Buildings	Wed 7/20/05	Thu 7/21/05
5	Literature Search	Thu 5/26/05	Fri 7/1/05
6	1st Draft QAPP	Fri 7/1/05	Mon 8/29/05
7	Protocol Development Team Review Meeting - Cincinnati	Tue 9/27/05	Thu 9/29/05
8	Revise QAPP	Fri 9/30/05	Tue 10/11/05
9	Protocol Team Review Revised QAPP	Wed 10/12/05	Thu 10/20/05
10	Revise QAPP	Fri 10/21/05	Mon 10/31/05
11	External Peer Review of QAPP	Tue 11/1/05	Mon 12/12/05
12	Revise QAPP	Tue 12/13/05	Mon 1/9/06
13	Public Review of QAPP	Tue 1/10/06	Tue 2/14/06
14	Finalize QAPP	Tue 2/14/06	Mon 2/27/06
15	Submit Final QAPP	Mon 2/27/06	Mon 2/27/06
16	Conduct Building Demolitions at Fort Chaffee (Temperature Dependent)	Wed 3/15/06	Fri 3/31/06
17	Laboratory analysis of samples and data validation	Tue 4/4/06	Fri 6/30/06
18	Data analysis and preparation of draft Final Report	Tue 5/30/06	Mon 8/21/06
19	External Review of 1st Draft Final Report	Tue 8/22/06	Fri 9/22/06
20	Revise 1st Draft Final Report	Fri 9/22/06	Mon 10/23/06
21	External Peer Review/Public Comment 2nd Draft Final Report	Tue 10/24/06	Fri 12/29/06
22	Revise Final Report	Tue 1/2/07	Thu 2/15/07
23	Submit Final Report	Mon 2/12/07	Mon 2/12/07

Figure 6-1. Project Schedule for Building Demolition Evaluation at Fort Chaffee

6.2.1 Perimeter Air Monitoring During Demolition

A series of stationary air monitors will be positioned to measure the potential release of airborne asbestos fibers from demolition of the NESHAP Method (#3602) and Alternative Method (#3607) Buildings. The movement of the released asbestos fibers with the prevailing winds (transport), the vertical movement of the fibers due to turbulence (dispersion), and the amount of fibers removed due to deposition will be influenced by the physical properties of asbestos fibers, the release characteristics during demolition and debris handling, and by meteorological conditions.

The perimeter air monitoring network will consist of three concentric rings around the rectangular-shaped buildings. The monitors will be distributed at approximately equal distances along each of the three rings. The monitors will be placed at two heights (5- and 15-ft) on Ring #1 (the primary ring) and will be placed at a height of 5 feet on Rings #2 and #3.

The distance of the rings from the face of the building was determined by using two EPA dispersion models: SCREEN3 and ISCST3. SCREEN3 (a Gaussian plume dispersion model) is a screening tool that uses a worst-case meteorology to produce a conservative one-hour average air concentration estimate. A refined modeling analysis was then conducted by using the ISCST3 (a steady-state Gaussian model) to predict location (i.e., lateral distance and height above ground level) where the maximum concentration of airborne asbestos is likely to occur.

The placement of the monitors will be sited and documented by using a global positioning system (Thales® Navigation MobileMapper GIS Data Collection System).

Meteorological conditions (such as wind direction and wind speed) will be determined during sampling. For this study, if sustained wind speeds of 15 mph (60-minute average) or gusts above 20 mph are encountered, demolition will pause until the wind speed is less than these conditions.

The demolition activities will be divided into two periods: morning and afternoon. All stationary monitors will be activated shortly before demolition activities begin, and will continue until demolition activities cease for that period. Building demolition is expected to take one day.

6.2.2 Personal Air Monitoring of Workers During Demolition

All workers directly involved with demolition of the building and handling of resultant debris will wear personal protective equipment as specified in this site-specific Health and Safety Plan (HASP). In accordance with OSHA Standards 29 CFR §1926.1101 (Asbestos) and 29 CFR

§1926.62 (Lead), each worker's personal breathing zone exposure concentration to asbestos fibers and lead will be measured. In addition, this monitoring will provide a reasonable characterization of the asbestos and lead concentrations in air closest to the source of any potential release; i.e., building demolition and debris loading.

6.3 Air Monitoring at Landfill

6.3.1 Perimeter Air Monitoring During Land Filling of Debris

A series of stationary air monitors will be positioned to measure the potential release of airborne asbestos fibers during land filling of the demolition debris from the NESHAP Method (#3602) and Alternative Method (#3607) Buildings.

The perimeter air-monitoring network will consist of one ring of monitors. The goal will be to place the monitors at 40-degree intervals measured along a radius from the center of the asbestos land filling activity as site conditions permit; i.e., topography and other land filling activities. The monitors will be placed at a height of 5 feet above ground. The monitors will be sited and documented by using a global positioning system (Thales® Navigation MobileMapper GIS Data Collection System).

Meteorological conditions (such as wind direction and wind speed) will be determined during sampling. If sustained wind speeds of 15 mph (60-minute average) or gusts above 20 mph are encountered, land filling will pause until the wind speed subsides below these levels.

6.3.2 Perimeter Air Monitoring During Land Filling of ACM from NESHAP Method Building

A series of stationary air monitors will be positioned to measure the potential release of airborne asbestos fibers during land filling of ACM from the NESHAP Method Building (#3602). The perimeter air-monitoring network will consist of one ring of monitors. The goal will be to place the monitors at 40-degree intervals measured along a radius from the center of the asbestos land filling activity as site conditions permit; i.e., topography and other land filling activities. The monitors will be placed at a height of 5 feet above ground. The monitors will be sited and documented by using a global positioning system (Thales® Navigation MobileMapper GIS Data Collection System).

Meteorological conditions (such as wind direction and wind speed) will be determined during sampling. If sustained wind speeds of 15 mph (60-minute average) or gusts above 20 mph are encountered, land filling will pause until the wind speed subsides below these levels.

6.3.3 Personal Air Monitoring of Workers During Land Filling

All workers directly involved with the land filling of the demolition debris will wear personal protective equipment as specified in the site-specific Health and Safety Plan (HASP). In accordance with OSHA Standard 29 CFR §1926.1101 (Asbestos) and 29 CFR §1926.62 (Lead), each worker's personal breathing zone exposure concentration to asbestos fibers and lead will be measured. In addition, this monitoring will provide a reasonable characterization of the asbestos and lead concentrations in air closest to the source of any potential release; i.e., land filling of the debris.

6.4 Background Perimeter Air Monitoring

6.4.1 Air Monitoring Prior to Asbestos Abatement of NESHAP Method Building

Air monitoring prior to asbestos abatement of the NESHAP Method Building will be conducted to collect data to compare air concentrations of asbestos during demolition to comparative background[3] concentrations. The monitoring will be conducted on one day immediately prior to abatement of the building. Monitoring will be conducted between approximately 08:00 and 12:00 hours and between 12:00 to 16:00 hours. The same number of samples will be collected during each sampling event. The air monitoring network will consist of one ring of monitors around the building. The monitors will be placed at 60-degree intervals measured along a radius from the center of the building. The monitors will be placed within 15 feet of the building and at a height of 5 feet above ground.

The monitors will be sited and documented, and the meteorological conditions (such as wind direction and wind speed) will be determined as described in Section A6.1.3.1, "*Perimeter Air Monitoring During Demolition*" of the QAPP.

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[3] Environmental "comparative" background is the airborne concentration of asbestos that is normally present in the area of the subject activity; i.e., the building demolition site at Fort Chaffee or landfilling activity at the City of Fort Smith Class D Landfill.

6.4.2 Air Monitoring Prior to Demolition of the Alternative Control Building

Air monitoring prior to demolition of the Alternative Control Building will be conducted to collect data to compare air concentrations of asbestos during demolition to comparative background concentrations. The monitoring will be conducted prior to demolition of the activity. .

The monitors will be sited and documented, and the meteorological conditions (such as wind direction and wind speed) will be determined as described in Section A6.1.3.1, "*Perimeter Air Monitoring During Demolition*" of the QAPP.

6.4.3 Air Monitoring Prior to Land filling of ACM and Building Debris

Air monitoring prior to land filling will be conducted to collect data to compare air concentrations of asbestos during land filling to comparative background concentrations. The monitoring will be conducted prior to land filling.

The monitors will be sited and documented, and the meteorological conditions (such as wind direction and wind speed) will be determined as described in Section A6.1.3.1, "*Perimeter Air Monitoring During Demolition*" of the QAPP.

6.4.4 Air Monitoring During Asbestos Abatement of NESHAP Method Building

6.4.4.1 Air Monitoring of Discharge Air From HEPA Filtration Units

Previous studies conducted by EPA of air filtration units equipped with HEPA filtration to maintain a negative static air pressure at asbestos abatement sites showed that a large percentage of the units discharged asbestos fibers (Kominsky et al., 1989; and Wilmoth et al., 1993). In-duct monitoring of the discharge air from each HEPA filtration unit used during the abatement of the NESHAP Method Building will be conducted. In-place performance will be conducted to determine each HEPA filtration unit's particle-removal efficiency using an air-generated dioctyl phthalate (DOP) aerosol (Kominsky et al., 1989). Isokinetic sampling[4] will also be conducted of the discharge air of each air filtration unit during abatement to determine the asbestos fiber concentration (Wilmoth et al., 1993).

[4] In isokinetic sampling, the velocity of air entering the sample nozzle (V_n) is the same as the velocity of the air stream (V_s). That is, the area of the sample nozzle tip opening (A_n) and the sample volume flow rate (Q_s) must be adjusted to obtain a velocity ($V_n = Q_s/A_n$) equal to the air stream velocity (V_s) at the sampling point. The sampling constraint ($V_n = V_s$) is termed *isokinetic* sampling or *equal velocity* sampling.

6.4.4.2 Air Monitoring of Ambient Air During Loading of Bagged ACM

The air around the disposal container (e.g., truck or roll-off container) will be monitored to determine whether this loading activity releases airborne asbestos fibers above comparative background levels. The removed materials (e.g., gypsum wallboard, glazing compound) will be double bagged in 6-mil polyethylene bags. The bagged material will be stored in the building and loaded out during one event. If space restrictions require the material to be loaded out more frequently, each event will be monitored.

The monitors will be placed at 60-degree intervals measured along a radius from the center of the disposal container. The monitors will be placed within 10 feet of the loading area and at heights of 5 feet and 15 feet above ground. The monitors will be sited and documented, and the meteorological conditions (such as wind direction and wind speed) will be determined as described in Section A6.1.3.1, "*Perimeter Air Monitoring During Demolition*", of the QAPP

6.5 Personnel

The key project personnel are identified in the project organization chart presented in Figure 1-1.

6.6 Project Schedule

The proposed project schedule is presented in Figure 6-1. The project schedule commences with Contract Award on May 23, 2005 and is completed with submission of the final report on February 12, 2007. The project schedule shows the major tasks, duration, and deliverables.

6.7 Noise Monitoring

Noise Monitoring will be performed as necessary on site depending on site conditions / activities. No noise hazards are anticipated.

6.8 Heat/Cold Stress Monitoring

Heat stress monitoring for the Alternative Asbestos Control Method Project will begin when temperatures exceed 80EF. Heat stress monitoring for personnel working in permeable clothing, such as cotton or synthetic work clothes, will be conducted in accordance with The American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Values for heat stress. The Site Safety Officer (SSO) will be responsible for verifying the work/rest schedules; notifying workers of results; and documenting results.

The SSO will also monitor workers wearing impermeable or semi-impermeable clothing to obtain physiological results through the following checks:

- Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.

- Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking). If oral temperature exceeds 99.6EF (37.6EC), shorten the next work cycle by one-third without changing the rest period. If oral temperature still exceeds 99.6EF (37.6EC) at the beginning of the next rest period, shorten the following work cycle by one-third. Do not permit a worker to wear a semi permeable or impermeable garment when his/her oral temperature exceeds 100.6EF (38.1EC).

- Body water loss (measure, if possible). Measure weight on a scale accurate to $\pm$ 0.25 lb at the beginning and end of each work day to see if enough fluids are being taken to prevent dehydration. Weights should be taken while the employee wears similar clothing or, ideally, is nude. *The body water loss should not exceed 1.5 percent total body weight loss in a work day.*

Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and the level of physical work. A form is provided in Appendix K to document physiological results.

Cold stress monitoring for the Alternative Asbestos Control Method Project will begin when temperatures fall below 40ºF. Cold stress monitoring for personnel working in permeable clothing, such as cotton or synthetic work clothes, will be conducted in accordance with The American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Values for cold stress. The SSO will be responsible for verifying the work/rest schedules; obtaining

atmospheric readings (wind speed, temperature, precipitation, etc.); notifying workers of results; and documenting results.

See Appendix I for cold stress monitoring procedures.

6.9 Location of Monitoring Records

Copies of monitoring records will be retained in the on-site command post during the project and in the job file upon completion of the project.

SECTION 7

SITE CONTROL AND STANDARD OPERATING PROCEDURES

7.1 Work Zones

The primary purpose for site controls is to establish the hazardous area perimeter, to reduce migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons.

7.1.1 Support Zone

The Support Zone or clean zone is normally a fixed area outside the Exclusion Zone (EZ) and Contamination Reduction Zone (CRZ) and within the geographic perimeters of the site. This area is commonly used for staging of materials, parking of vehicles, office facilities, sanitation facilities, and receipt of deliveries.

Personnel entering the support zone may include delivery personnel, visitors, security guards, etc., who will not necessarily be permitted in the EZ. All personnel arriving in the SZ will (upon arrival) report to the command post and sign the site entry/exit log. There will be controlled entry/exit points from the support zone to the CRZ. The location of the support zone(s) will be established prior to site activity, but no later than upon mobilization by the Project Manager and/or_____ *(complete on site).*

7.1.2 Contamination Reduction Zone

The Contamination Reduction Zone (CRZ) will provide a location for removal of contaminated personal protective equipment and final decontamination of personnel and equipment. All personnel and equipment should exit the Exclusion Zone via the CRZ area. A separate decontamination area will be established for heavy equipment.

The Contamination Reduction Zone is a buffer zone between contaminated and clean areas that is identified by caution tape. Once on site, the Project Manager and Site Health and Safety officer will establish the CRZ(s).

7.1.3 Exclusion Zone

The Exclusion Zone (EZ) will be the "hot-zone" or contaminated area inside the site perimeter. The exclusion zone or work areas will be delineated by either chain-link fence or orange construction fence with signage (see work plan). The Project Manager will establish the EZ once on site.

General Safety Rules for the Exclusion Zone include:

- Wear the appropriate level of PPE defined in the HASP.
- Do not remove any PPE or break the integrity to pick, scratch, or touch parts of your body.
- No smoking, eating, or drinking.
- No horseplay.
- No matches or lighters in this zone.
- Implement the communication and line of sight system.

7.2 General Field Safety Rules

The following are general field safety rules:

- All visitors must be sent to the command post.
- Whenever possible, avoid contact with contaminated (or potentially contaminated) surfaces. Walk around (not through) puddles and discolored surfaces. Do not kneel on the ground or set equipment on the ground. Stay away from any waste drums unless necessary. Protect equipment from contamination by bagging.
- Eating, drinking, or smoking is permitted only in designated areas in the Support Zone.
- Hands and face must be thoroughly cleaned upon leaving the decon area.
- Beards or other facial hair that interfere with respirator fit will preclude admission to the EZ If respiratory protection is required.
- All equipment must be decontaminated or discarded upon exit from the Exclusion Zone, as determined by designate.
- Safety Equipment described in Section 4 will be required for all field personnel in the Exclusion Zone.
- Personnel will only travel in vehicles where individual seats for each occupant are provided. Seat belts will be worn as required.
- Fire extinguishers will be available on site and in all areas with increased fire danger such as the refueling area.

- A minimum of two personnel will always be on site whenever heavy equipment is operated. Only necessary personnel need to be on or around heavy equipment.

- Employees will not interfere with or tamper in any way with air monitoring equipment.

- Backhoes or other equipment with booms shall not be operated within 10 feet of any electrical conductor.

- Visitor log will be maintained at the command post or with the security guard. All personnel coming on site will sign in and out on a daily basis.

- If unauthorized members of the public are found on site, contact security immediately and do not leave the individual unattended.

- Visitors are not allowed in the work areas without authorization and not without appropriate levels of PPE as determined by site safety personnel. Access to the properties is restricted to the authorized representatives. All persons must sign in at the Command Post and receive authorization to enter the project area.

- Buddy System

  - The buddy system is mandatory at anytime that personnel are working in the Exclusion Zone, remote areas, on tanks, or when conditions present a risk to personnel.

  - A buddy system requires at least two trained/experienced people who work as a team and maintain at a minimum audible and/or visual contact while operating in the Exclusion Zone.

- Communication Procedures

  - If radios will be used for on-site communications, Channel _____ *(complete on site)* will be the designated channel.

  - The crews should remain in constant radio or visual contact while on project site.

  - The site evacuation signal will be three blasts on the air or vehicle horn.

SECTION 8

DECONTAMINATION PROCEDURES

In general, everything that enters the Exclusion Zone at this site must either be decontaminated or properly discarded upon exit from the Exclusion Zone. All personnel, including any state and local officials, must enter and exit the hot zone through the decon area. Prior to demobilization, contaminated equipment will be decontaminated and inspected by the designate before it is moved into the clean zone. Any material that is generated by decontamination procedures will be stored in a designated area in the Exclusion Zone until disposal arrangements are made.

8.1 Decontamination Areas

A three-chambered decontamination area adjacent and connected to the regulated area shall be established for all large-scale Class I asbestos work and shall consist of the following:

- An equipment room supplied with labeled, impermeable bags and containers for containment and disposal of contaminated protective equipment.
- A clean change room equipped with a locker or appropriate storage container for each worker.
- Shower facilities that comply with the requirements in 29 CRF 1910.141 (d)(3), unless such facilities are not feasible. Showers shall be adjacent to both the equipment room and clean room, if feasible. The water for the shower should have a temperature of at least 32°C and a flow rate of at least 10 L/min.

Workers enter and exit a regulated area through the decontamination area. Therefore, the equipment room and clean room each shall be at least 1 m^2 in surface area and 2 m high, if feasible. If locating the shower between the equipment room and the clean room is demonstrated to be unfeasible, or if the work is performed outdoors, then workers shall do either of the following:

- Remove asbestos contamination from their work suits in the equipment room using a HEPA vacuum before proceeding to a shower that is not adjacent to the work area.

- Remove their contaminated work suits in the equipment room, then don clean work suits and proceed to a shower that is not adjacent to the work area.

Below are the steps for entering and leaving a decontamination area.

8.1.1 Entry into a Decontamination Area

- Enter the decontamination area through the clean room.
- Remove and deposit street clothing in the locker provided.
- Don protective clothing and respiratory protection before leaving the clean room.
- Go through the shower and equipment rooms to enter the regulated area.

8.1.2 Exit from a Decontamination Area

1. Remove all gross contamination and debris from protective clothing before leaving the regulated area.

2. Without removing the respirator, remove protective clothing in the equipment room. Deposit the clothing in labeled, impermeable bags or containers.

3. Shower with the respirator on before entering the clean room.

4. Take off the respirator and change into street clothes in the clean room.

The respirator cartridges (if APR) shall not be reused. .

8.2 Alternatives to a Decontamination Area

Alternate decontamination procedures may be used for limited-scale Class I asbestos work. For example, an equipment room (or area) can be set up adjacent to the regulated area, or mini-enclosures may be used for the decontamination of workers and equipment. The design and work practices for an equipment room and mini-enclosure are as follows.

8.2.1 Alternative Controls for Class I Asbestos Work

Class I asbestos work may be performed using controls other than those specified in this document if all of the following provisions are met:

- The alternative control method encloses, contains, or isolates the processes or source of airborne asbestos dust or otherwise captures or redirects such dust before it enters the breathing zone of workers.

- An industrial hygienist or professional engineer qualified, as a project designer, to evaluate the work area, the projected work practices, and the engineering controls certifies, in writing, that the alternative method is sufficient to prevent
  - Direct and indirect worker exposure from exceeding the PELs under worst-case conditions of use.
  - Asbestos contamination from exceeding the clearance level outside the regulated area.

Subcontractors who use an alternative procedure shall retain a certified industrial hygienist or project designer to perform such evaluations and shall submit the results to the EQ industrial hygienist for review and approval. The evaluation of TSI (25 linear feet or 10 ft^2 or less) or surfacing material (10 ft^2) to be removed may be performed or reviewed by a competent person. Perimeter or clearance monitoring otherwise required may be omitted in such cases.

8.2.2 Controls for Class II Asbestos Work

Class II asbestos work may be performed using one of the control systems allowed for Class I asbestos work. Only glove bags and glove boxes that fully enclose the material to be removed are allowed.

8.2.3 Contamination Control

An impermeable drop cloth shall be placed on all surfaces that may become contaminated during removal activities involving Class II asbestos.

8.3 Decontamination Areas

Any Class II asbestos work that is known to result in exposure exceeding the PELs shall be provided with a three-chambered decontamination system, if feasible. Class II asbestos work for which there is no NEA should be provided with either a three-chambered decontamination system or an equipment room, as determined by the project team industrial hygienist. The design and work practices for an equipment room for Class II asbestos work, including procedures for entering and leaving the decontamination area, are the same as those for Class I asbestos work.

8.4 Removal of PACM/ACM

Specified below are procedures for removal of various types of PACM/ACM.

Floor Tiles

Workers shall comply with the work practices below when removing vinyl and asphalt flooring materials that contain PACM/ACM.

- Flooring or its backing shall not be sanded.
- Vacuums equipped with HEPA filters, disposable dust bags, and metal floor tools (without a brush) shall be used to clean floors.
- Linoleum sheeting shall be removed by cutting, wetting of the snip point, and wetting during delamination. Do not rip up resilient sheeting or flooring material.
- All scraping of residual adhesive or backing shall be performed using wet methods or devices equipped with a HEPA-filtered local exhaust system.
- Dry sweeping is prohibited. Instead, dry HEPA vacuuming shall be used.
- Mechanical chipping is prohibited unless performed in an NPE. Any procedure that requires breaking tile, thereby creating visible or measurable asbestos-containing dust in air, is considered mechanical chipping.
- Tiles shall be removed intact whenever possible. Wetting may be omitted when tiles are heated and can be removed intact.
- Resilient flooring material, including associated mastic and backing, shall be assumed to contain asbestos unless an industrial hygienist or qualified building inspector determines, by means of polarized light microscopy, that the material is free of asbestos.

Roofing

Workers shall comply with the work practices described below when removing roofing material with PACM/ACM.

- Roofing material shall be removed intact to the extent feasible.
- Wet methods should be used when feasible. The use of wet methods is not required for roof removal if the PACM/ACM is removed intact, if exposure does not exceed the PELs, and if wetting would create a substantial slipping hazard. When cutting machines are used, and the material is not removed intact, wet methods are required to the extent that the procedure does not create a slipping hazard.
- All loose dust from sawing operations shall be HEPA vacuumed immediately. When built-up, smooth (i.e., non-graveled) roofing is removed using a power cutter, dust may be wet swept rather than HEPA vacuumed.

- Wet methods and HEPA vacuuming are not required to remove or repair less than 25 ft^2 of roofing material if the material remains intact and does not generate visible dust.

- Cutting machines shall be continuously misted during use unless a competent person determines that misting substantially decreases worker safety.

- ACM that has been removed from a roof shall not be dropped or thrown to the ground. Instead, such material shall be carried or passed to the ground by hand or lowered to the ground with a covered, dust-tight chute, crane, or hoist.

    - Nonintact ACM shall be lowered to the ground as soon as practicable, but in any event no later than the end of the work shift. While on the roof, the material shall either be kept wet, placed in a impermeable waste bag, or wrapped in plastic sheeting.

    - Intact ACM shall be lowered to the ground as soon as practicable, but in any event no later than the end of the work shift.

- Roof-level heating and ventilation air-intake sources shall be isolated, or the ventilation system shall be shut down.

Asbestos Cement Panels

The work practices described below are applicable when removing cementitious asbestos-containing siding, shingles, or Transite panels.

- Cutting, abrading, or breaking of siding, shingles, or Transite panels are prohibited unless the employer can demonstrate that other methods less likely to result in asbestos fiber release cannot be used.

- Each panel or shingle shall be sprayed with amended water prior to removal.

- Unwrapped or unbagged panels or shingles shall be lowered to the ground immediately via a covered, dust-tight chute, crane, or hoist. Alternatively, panels or shingles may be placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.

- Nails shall be cut with flat, sharp tools.

Gaskets

The following work practices apply when removing gaskets containing PACM/ACM.

- A gasket that is visibly deteriorated and cannot be removed intact shall be removed within a glove bag or glove box equipped with a HEPA-filtered local exhaust system.

- A gasket shall be wet thoroughly with amended water prior to removal and immediately placed in a disposal container.

- Any scraping to remove PACM/ACM residue shall be performed using wet methods.

8.3.1 Miscellaneous Materials Containing PACM/ACM

The work practices below apply to miscellaneous materials containing PACM/ACM.

- Material shall be thoroughly wetted with amended water prior to and during removal.
- Material shall be removed in an intact state unless the employer demonstrates that intact removal is not possible.
- Cutting, abrading, or breaking the material is prohibited unless the employer can demonstrate that methods less likely to result in asbestos fiber release are not feasible.
- Material that is removed shall be immediately bagged, wrapped, or kept wet until transferred to a closed receptacle no later than the end of the work shift.

8.3.2 Alternative Controls for Class II Asbestos Work

Controls different from those described in this document, as well as modified engineering and work practice controls, may be used if all of the following provisions are met:

- The organization planning the work demonstrates, by data representing worker exposure (e.g., NEA), that during the use of such method, worker exposure will not exceed the PELs under any anticipated circumstances.
- A competent person evaluates the work area, the projected work practices, and the engineering controls and certifies, in writing, that the alternate method is sufficient to prevent
    - Direct and indirect worker exposure from exceeding the PELs under worst-case conditions of use.
    - Asbestos contamination from exceeding the clearance level outside the regulated area.

A competent person shall perform the evaluation for work done by LLNL employees or subcontract workers. Subcontractors who use an alternative procedure shall retain a competent person to perform the evaluation and submit the results to the ES&H Team industrial hygienist for review and approval.

8.4 Training

The following training is required for workers who perform **no construction** asbestos work:

- General Asbestos Safety Awareness
- Job-specific training provided by the project team industrial hygienist at a safety meeting.

8.5 Procedures for Equipment Decontamination

Following decontamination and prior to exit from the hot zone, the designated alternate shall be responsible for ensuring that the item has been sufficiently decontaminated. This inspection shall be included in the site log.

Equipment decontamination will consist of the following steps:

- Remove of gross contamination by sweeping or scraping.
- Hydrospray equipment.
- Inspect equipment prior to removal from CRZ.

Small equipment decon will involve wet wiping equipment with appropriate decon solution.

Personnel will not wear PPE or bring dirty/contaminated clothing into the support zone.

8.6 Emergency Decontamination

Decontamination will consist of the following steps:

- Move the victim only if it is safe to do so.
- Decontaminate the victim only to the extent as to allow safe removal of the victim without further injury.
- Any blood-contaminated material or body fluid will be bagged, labeled as a biohazard, and accompany the individual to the hospital.

8.7 Decontamination Equipment

The following decontamination equipment is required: tables, chairs, trashcans and liners, scrub brushes, buckets, brooms, scrapers, soap, and cleaning supplies.

8.8 Disposition of Decontamination Wastes

All equipment and solvents used for decontamination shall be decontaminated or disposed of with the established waste streams. Commercial laundries or cleaning establishments that decontaminate or are used to launder contaminated clothing shall be informed of the presence and potentially harmful effects of the contaminants. Less than 50 pounds per month of biohazard waste may be disposed with routine waste.

SECTION 9

HAZARD COMMUNICATION PROGRAM

Each contractor will be responsible for maintaining a copy of its Hazard Communication Program and MSDS' on site.

9.1 Material Safety Data Sheets

MSDS' will be maintained at the Command Post in the Health and Safety Binder, and will be available to all employees for review during the work shift. See Appendix C and/or the Health and Safety Binder.

9.2 Container Labeling

All containers received on site will be inspected by the contractor using the material to ensure the following:

- All containers are clearly labeled, legible, and in English.
- Containers are marked with the appropriate hazard warning.
- Containers contain contact information of the manufacturer.

9.3 Hazardous Chemical List

The following hazardous chemicals are inventoried and may be used at the site. This list includes hazardous chemicals utilized by the contractor during operations, NOT chemical hazards associated with cleanup/remediation (see Appendix C for MSDSs).

- Gasoline
- Diesel fuel No. 2
- Marking paint

9.4 Employee Training and Information

Prior to starting work, each employee will attend a health and safety orientation and will receive information and training on the following:

- An overview of the requirements contained in the Hazard Communication Standard
- Hazardous chemicals present at the site
- Location and availability of the written Hazard Communication Program
- Physical and health effects of the hazardous chemicals
- Methods of preventing or eliminating exposure
- Emergency procedures to follow if exposed
- How to read labels and review MSDS' to obtain information
- Location of MSDS file and location of hazardous chemical list

For additional information, refer to the Health and Safety Binder for the Hazard Communication Program and applicable MSDS.

SECTION 10

EMERGENCIES/ACCIDENTS/INJURIES

It is essential that site personnel be prepared in the event of an emergency. Emergencies can take many forms: illnesses or injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather. The following sections outline the general procedures for emergencies. Emergency information should be posted as appropriate.

10.1 Emergency Contacts for Alternative Asbestos Control Method Project

Fire:	911
Police:	911
Sheriff:	911
Ambulance:	911

Hospital:

Harbor View Mercy Hospital
10301 Mayo Dr.
Barling, AR 72923
Telephone: 479-314-5550

Directions from Fort Chaffee to Hospital (See Map in Appendix B):

- Start WEST on GERALD ST (0.1 mi)
- Turn RIGHT onto S 14th ST (0.1 mi)
- Turn LEFT onto AR-255 / CHURCH ST (0.2 mi)
- Turn RIGHT onto AR-253 / STOZIER LN (0.8 mi)
- Turn LEFT onto AR-22 / FORT ST (0.2 mi)
- Turn RIGHT onto MAYO DR (0.4 mi)
- End at 10301 Mayo Dr
- Estimated time: 5-10 minutes
- Estimated Distance 2-3 miles

NOTE: Maps and directions to the hospital will be posted in the Command Post and in EQ vehicles. (Confirm route below)

The route to the hospital was verified by _____ on _____, 2005. Distance from site to hospital is ___ miles. Approximate driving time is ___ minutes. The local fire, police, and hospital were notified of site operations by _____ on _____, 2005.

10.2 Additional Emergency Numbers

Center for Disease Control	404-488-4100 (24 hr)
AT&F (Explosives Information)	800-424-9555
Chemtrec	800-424-9300

Environmental Quality Management, Inc., Contacts

EQ Regional Office	513-825-7500
EQ Hotline (24 hr)	800-500-0575
EQ Corporate H&S - J. Kominsky, CIH, CSP	513-825-7500
EQ Health & Safety Manager - N. Michailides	513-825-7500
Mercy Health Solutions - Dr. J. Tasset	513-874-8111

10.3 Emergency Equipment Available On Site

Communications Equipment

- Private Telephones: EQ office trailer or Command Post
- Two-Way Radios: Command Post, CRZ, and EZ
- Emergency Alarms/Horns: Command post, CRZ, and EZ

Medical Equipment

- First Aid Kits: Command Post and CRZ

Inspection Date: _____By:

- Eye Wash Station:

Firefighting Equipment

- Fire Extinguishers: Command Post, CRZ, and EZ

Inspection Date:_____By:

- Other:

Spill or Leak Equipment (if applicable)

- Absorbent booms/pads and dry absorbent:

Additional Emergency Equipment (list below once at project site)

10.4 Accident Reporting/Investigation

Any significant failures of the HASP, including those resulting in any injury or property damage, will be investigated. The investigation will be performed by the SSHO with the support of the Project Manager. In addition, the government representative will be immediately informed of any incident requiring investigation and the progress of the investigation. The government representative will determine if the incident is serious enough to warrant modifying or terminating certain field activities pending the results of the investigation. The Accident Investigation Checklist is presented in the HASP. The results of any accident investigation will be summarized in a report. This report will be maintained on site for the duration of the project and made available to the government representative. EQ will report, in writing, the occurrence of a recordable accident (as defined by 29 CFR 1904.12) to the government representative within 24 hours of its occurrence. As a follow-up, EQ will forward a completed Accident Investigation Report to the government within 72 hours of the accident's occurrence. EQ agrees to participate in any and all inquiries into such accidents made by the government representative. All injuries or occupational illnesses excluding injuries requiring only first aid must be investigated, and an Accident/Injury Report Form must be completed. In the case of an injury to an employee that requires medical treatment, these steps will be followed:

- Procure medical treatment for the worker.
- The SSHO and Project Manager will investigate the incident and fill out appropriate Accident/Injury Report Form(s).
- The SSHO will complete and submit any necessary worker's compensation reports.
- The Project Manager will ensure the government representative is notified immediately.
- OSHA Form 300 Log will be updated by the SSHO if the injury is recordable per 29 CFR 1904.

- A report must be obtained from the attending physician that clears the employee to resume regular duties, describes any modified work that is acceptable, or removes the employee from work duty.

In the case of a fatal injury or where three or more persons are admitted to the hospital for an overnight stay, OSHA and other appropriate agencies will be notified within 48 hours of the incident, and an in-depth accident investigation will be conducted in addition to the steps identified above.

The Project Manager and/or SSO will immediately notify the government representative in the event of an accident that results in death, serious injury, or substantial property damage. The government representative will determine if field activities should be immediately modified or terminated. This determination will be made in concurrence with the applicable government representative.

SECTION 11

EMERGENCY RESPONSE CONTINGENCY PLAN

11.1 Project Personnel Responsibilities During Emergencies

The Project Manager or designated government representative has primary responsibility for responding to and correcting emergency situations. Duties include:

- Take appropriate measures to protect personnel including: withdrawal from the Exclusion Zone, total evacuation and securing of the Project Site, or upgrading or downgrading the level of protective clothing and respiratory protection.
- Take appropriate measures to protect the public and the environment including isolating and securing the Project Site, preventing runoff to surface waters, and ending or controlling the emergency to the extent possible.
- Ensure that appropriate Federal, State, and local agencies are informed, and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. In the event of an air release of toxic materials, the local authorities should be informed in order to assess the need for evacuation. In the event of a spill, sanitary districts and drinking water systems may need to be alerted.
- Ensure that appropriate decon treatment or testing for exposed or injured personnel is obtained.
- Determine the cause of the incident and make recommendations to prevent the recurrence.
- Ensure that all required reports have been prepared.

The Project Manager must immediately report emergency situations to the designated government representative, take appropriate measures to protect Project Site personnel, and assist as necessary in responding to and mitigating the emergency situation.

11.2 Medical Emergencies

Any person who becomes ill or injured in the Exclusion Zone must be decontaminated to the maximum extent possible when practical. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the

patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket.) First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the Project Manager.

If the first aid provided to an injured person presents the possibility of exposure to blood or other body fluids or potentially infectious material, the caregiver must wear surgical-type impermeable gloves. The exposure must be reported to the Project Manager, the individual's supervisor, and the Site Safety Officer within 24 hours of exposure, naming the injured person(s) and the person(s) administering first aid. Hepatitis B vaccination and treatment must be offered to exposed individuals within 24 hours or as soon as possible after exposure. Exposed individuals may decline the vaccination and treatment but must do so by means of a signed statement.

Any person transporting an injured/exposed person to a clinic or hospital for treatment should take with them directions to the hospital and information on the chemical(s) they may have been exposed to. This information is included in Table 2-1. Any vehicle used to transport contaminated personnel will be cleaned or decontaminated as necessary.

11.3 Fire or Explosion

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the Project Manager or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on site.

If it is safe to do so, site personnel may:

- Use firefighting equipment available on site.
- Remove or isolate flammable or other hazardous materials that may contribute to the fire.

11.4 Spills, Leaks or Releases

In the event of a spill or a leak, site personnel will:

- Locate the source of the spillage and stop the flow if it can be done safely.
- Begin containment and recovery of the spilled materials.

11.5 Evacuation Routes and Resources

Evacuation routes have been established by work area locations for this Project Site. All buildings and outside work areas have been provided with designated exit points. Evacuation should be conducted immediately, without regard for equipment under conditions of extreme emergency. See site map in Appendix B for evacuation routes.

- Evacuation notification will be three blasts on an air horn or vehicle horn, or by verbal communication via radio.
- Keep upwind of smoke, vapors, or spill location.
- Exit through the decontamination corridor if possible.
- If evacuation is not via the decontamination corridor, site personnel should remove contaminated clothing once they are in a location of safety and leave it near the Exclusion Zone or in a safe place.
- The Project Manager will conduct a head count to ensure all personnel have been evacuated safely.
- In the event that emergency site evacuation is necessary, all personnel are to:
  - Escape the emergency situation.
  - Decontaminate to the maximum extent practical.
  - Meet at the command post.
- In the event that the command post is no longer in a safe zone at which to meet, a secondary gathering point will be (complete on site): _____

11.6 Adverse Weather Reaction Plan

Adverse weather can take many forms. Severe thunder and lightning storms, winter storms, hail, freezing rain, flash floods, and tornados are a few examples. Sudden changes in the weather, extreme weather conditions, and natural disasters can create a number of hazards. Generally, adverse weather can create hazards due to slips, trips, and falls; generation of airborne debris; electrical shock; etc. Natural disasters can create many secondary hazards such as release of hazardous materials into the environment, structure failure, and fires.

In the event of impending adverse weather, continuous monitoring will provide current information regarding such conditions. In addition, monitoring of weather broadcasts and

television broadcasts will provide information on current weather conditions. The terms "tornado watch" and "tornado warning" may be used during the broadcasts. The former term means that conditions are favorable for their development although none have actually been sighted. The latter term means that a tornado has been visually sighted. Additional weather terminology includes:

- Weather Watch - tornado, severe t-storm, flash flood, winter storm. "Conditions are favorable for the development/occurrence of hazardous weather."
- Weather Warning - by county issuance
- Tornado - tornado sighted or indicated by radar
- Severe T-storm - winds > 50 mph and/or ¼-inch hail stones sighted or predicted by radar
- Flash Flood - sighted or indicated by radar

Information provided by the emergency and weather radio broadcasts will be used to determine whether any actions need to be taken by project personnel. The EPA in conjunction with the Response Manager and Site Safety Officer will decide what operations, if any, are safe to perform based on existing and anticipated weather conditions, and shall notify personnel when to stop operations and seek shelter.

The best protection against most severe weather episodes and natural disasters is to seek shelter before a storm hits. When notification is given that severe weather (particularly tornados) is approaching an area where project personnel are located, begin to secure the Project Site. If a site is experiencing severe weather, the Project Manager will decide whether to stop work activities and have affected personnel seek shelter.

At the Project Site, workers in Level B and C personal protective equipment will be instructed to:

1) Leave the building, doff protective clothing, and seek shelter (if adequate advance warning is given).

2) Remain inside the building and sit away from any windows.

3) Lie down and curl up.

Heavy equipment operators shall shut down all equipment if safe to do so and seek shelter until weather improves. All other field personnel should exit the trailers and seek shelter until the weather improves. Do not seek shelter under the trailers under any circumstances. If no warning is provided, personnel should leave the trailers and lie face down in low-lying grassy areas away from the trailers.

Take the following actions in the event of the following weather conditions:

Tornado - Vacate trailers and automobiles, and seek building/shelter on/above ground.
Severe T-storm/Lightning - Avoid tall trees, metal objects, towers, fences, and creek beds.
Flash flood - Seek higher ground.

SECTION 12

CONFINED SPACE

A confined space is defined as a space or work area not designed or intended for normal human occupancy, having limited means of access and poor natural ventilation, and/or any structure, including a building or room, that has limited means of egress. Examples include tanks, vats, and basements. If a confined space entry is conducted, it will be done in accordance with applicable OSHA standards.

The SSO will evaluate any confined space to determine if it is a Permit Required Confined Space (PRCS). If it is a Permit Confined Space, the SSO will perform a hazard evaluation and identify means of entry, work to be completed, exit procedures, emergency exit procedures, needed equipment, and assigned personnel. The PRCS-permit will be completed to reflect this evaluation. The Permit will be authorized by the Project Manager and reviewed with the designated site representative. The Permit, Entry Plan, and SOP will be discussed with personnel assigned to the task (i.e., entrants, standbys, supervisor, and emergency responders). The fire department must be notified in advance if they are to be emergency responders. The permit will be valid for only one shift and one task. The permits will be maintained with Project Site safety files.

APPENDIX A

SITE SAFETY PLAN AMENDMENTS

Health & Safety Plan Amendment: #_____ :

Project Name:

Date:

Type of Amendment:

Reason for Amendment:

Alternate Safeguard Procedures:

Required Changes in PPE:

Please sign and date below:

- Safety Manager:

- Project Manager:

- Government Representative:

APPENDIX B

SITE MAPS

APPENDIX C

CHEMICAL HAZARD INFORMATION

APPENDIX D

PERSONAL PROTECTIVE EQUIPMENT
AND
RESPIRATORY PROTECTION SOPs

APPENDIX E

ACCIDENT REPORTING/INVESTIGATION

APPENDIX F

HOUSEKEEPING

APPENDIX G

HIGH-PRESSURE WATER CLEANUP

APPENDIX H

WORKING AROUND HEAVY EQUIPMENT

APPENDIX I

HEAT AND COLD STRESS

APPENDIX J

NIOSH ANALYTICAL METHODS

APPENDIX K

H&S FORMS/POSTING

APPENDIX L

FALL PROTECTION

APPENDIX M

ASBESTOS BULK SAMLING / ASBESTOS AIR SAMPLING

APPENDIX N

ELECTRICAL SAFETY

APPENDIX O

GENERATOR

APPENDIX P

BIOLOGICAL HAZARDS

APPENDIX Q

SITE SAFETY PLAN ACKNOWLEDGMENT FORM

SITE SAFETY PLAN ACKNOWLEDGMENT FORM

I have been informed and understand and will abide by the procedures set forth in the Health & Safety Plan and respective Amendments, if any, for the Alternative Asbestos Control Method Project.

Print Name	Signature	Representing	Date