

Lead and Asbestos Management Plan

**Wrangell-St. Elias National Park and Preserve
Copper Center, Alaska 99573**

**Approved:
May 2003**

By:

Park Superintendent

**Lead and Asbestos Management Plan
Wrangell-St. Elias National Park and Preserve
Copper Center, Alaska 99573**

Adapted from:

***“Lead and Asbestos Management Plan
Former Kennecott Mine Town
Wrangell-St. Elias National Park
Kennecott, Alaska”***

By
Hart Crowser, Inc.

Contact
Bruce Ream
Senior Associate, Project Manager

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Reviewed and Edited by
Park Staff

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APPENDIX A LEAD AND ASBESTOS GUIDANCE DOCUMENT

LEAD AND ASBESTOS MANAGEMENT PLAN

WRANGELL ST. ELIAS NATIONAL PARK AND PRESERVE

COPPER CENTER, ALASKA

1.0 INTRODUCTION

This Lead and Asbestos Management Plan (Plan) provides general guidance for National Park Service employees performing routine construction and preservation work within the Wrangell-St. Elias National Park and Preserve (WRST) with special emphasis on the Historic Kennecott Mine Town Site (Kennecott) where the greatest chance of potential exposure exists. Specific abatement of lead-based paint from surfaces, or removal or encapsulation of asbestos-containing materials (ACM) must be performed by workers who have received proper training and certification for that type of work. Specific work plans for the abatement or removal jobs must also be implemented. This Plan is not designed to provide instructions for specific abatement jobs, but only health protection guidance for workers whose jobs involve incidental exposure to lead or asbestos and who have not been specifically trained to remove lead-based paint (LBP) or ACM. The goal of the Plan is to provide practical information and precautionary measures that will help workers avoid accidentally inhaling or ingesting lead or asbestos during their routine jobs.

This Plan includes worker protection procedures for construction or other activities where exposure to airborne lead is at or above the OSHA action level of 30 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), and where worker exposure to airborne asbestos fibers is at or above the OSHA Permissible Exposure Limit (PEL) of 0.1 fibers/cc (f/cc). Following the instructions in this Plan should also minimize foreseeable exposure to lead-contaminated dust, soil, and asbestos-contaminated soils. This Plan includes requirements for engineering controls, work practices, personal protective equipment, respirators, and air monitoring for protection from exposure to lead and asbestos.

This Plan has been written for use by NPS employees and contractors. It is not meant for the protection of visitors, as it is not anticipated that they will perform any work at the site. This Plan is specifically limited in its application to the site conditions, purposes, dates, and personnel specified. It should be amended or updated as conditions change, new information is obtained, or different activities are performed.

2.0 SITE ACTIVITIES INVOLVING POTENTIAL EXPOSURE TO LEAD

Table 2-1 presents a list of worker activities known to be performed at the Kennecott Town Site and would apply to other locations throughout the Park. Each task has been evaluated as to whether it potentially falls under the OSHA Lead in Construction Standard. However, for any task evaluated in Table 2-1 as not being covered under the Lead Standard, exposure while performed the task to any lead-contaminated soils and interior dust, or to painted surfaces containing lead, would cause that task to be covered.

Table 2-1 Work Tasks Performed at Kennecott NHL

Task	Potentially Covered by OSHA Lead Standard
Conduct archeological survey and testing of ground around building to mitigate potential impact from building stabilization, locate and manage artifacts	Yes
Construct foundation / footing concrete and pressure treated wood and cribbing. Excavate with backhoe and by hand.	Yes
Construct timber retaining wall	No
Cut back vegetation against or near building	No
Make repairs to painted wood siding, skirt, and trim; reail	Yes
Realign wood frame walls	Yes
Reattach loose corrugated metal roofing	No
Reconstruct timber retaining wall	No
Reestablish landscape elements	No
Remove building debris around perimeter of building	Yes
Remove earth in contact with building - Provide drainage around building	Yes
Wet scrape painted wood siding, repaint exterior and interior surfaces	See Note
Repair existing foundation / footing; wood and concrete	Yes
Repair / rebuild / repaint wood windows and doors including removing window casing and wooden molding, removing the window sash, heating the glazing, scraping and removing the softened glazing, re-installing the sash, re-hanging the window, and installing the wooden molding.	Yes
Replace roof covering; wood shingles, galvanized metal, rolled asphalt roofing	No
Roof Repair – Stripping Old Roofing, Installing New Roofing (Rolled, Shingles, Metal)	No
Re-support foundation posts and sills; install additional bracing, partial excavation	Yes
Secure building: Installing locks, hasps, steel screening, and boarding doors	Yes
Backhoe/Loader Operation – Excavation, Stripping	Yes
Hand Excavation – Foundations,	Yes
Window and Door Repair – Removal, Repair, Replacement Removal of hinge	Yes

Task	Potentially Covered by OSHA Lead Standard
pins or painted door hinges. Removal of lock hardware, closers, or other hardware accessories from a painted door.	
Sanding floor with "stand-behind" power disc sander, scraping floor near corner, clean-up of debris and placing debris in container.	See Note
Erect scaffolding on exterior and interior of building	No
Erect support scaffolding for structural support	No
HEPA vacuuming interior	Yes
Pressure washing exterior walls	Yes
Removing exterior and interior wood siding	Yes
Removal of nails, screws, picture hangers, or other fasteners, etc. from a painted wall surface.	Yes
Jacking and leveling buildings	Yes
Repair and replacement of deteriorated wall studs, posts, and truss members	Yes
Installing electrical wiring, receptacles, lighting, load centers, meter base, and generators	No
Installing fiberglass insulation	No
Maintaining water treatment (filters, chlorination, lines, tanks)	No
Garbage collection and custodial for visitors	No
Transporting materials to site	No
Fueling vehicles and generators	No
Transporting lead waste from site	Yes
Transporting hazardous waste from site (oils, asbestos)	No
ATV transportation	No

Note: These activities would be classified as lead abatement projects if the purpose of the work is specifically to remove lead-based paint from the surfaces. This Plan only provides general guidance for protection of workers whose exposure to lead is incidental to their work. Project specific lead abatement work plans are necessary for protecting workers specifically removing paint containing lead.

3.0 REGULATORY LIMITS FOR LEAD

3.1 Worker Lead Exposure Regulations

OSHA Lead in Construction Standard

Based on OSHA's interpretation of their Lead in Construction Standard, 29 CFR 1926.62, all occupational exposures to lead occurring in the course of construction work are covered by this standard. Construction work is defined as construction, alteration and/or repair, including structural painting and decorating, repair or

renovation activities, or other activities that disturb in place lead-containing materials, but does not include routine cleaning and repainting where there is insignificant damage, wear, or corrosion of existing lead-containing paint. This Plan is designed to protect workers from exposure to lead paint in these situations.

Employees performing maintenance activities not associated with construction work are covered by the OSHA General Industry Standard for Lead, 29 CFR 1910.1025. Maintenance activities include making or keeping a structure, fixture, or foundation in proper condition in a routine, scheduled, or anticipated fashion. This Plan is designed to protect workers from exposure to lead paint in these situations.

For all occupational exposure to lead occurring in the course of construction work, the standard does not specify a minimum amount or concentration of lead that triggers a determination that lead is present and the potential for occupational exposure exists.

The lead-based paint hazard reduction activities defined in Title IV of the Housing and Community Development Act of 1992, including interim controls and abatement are also covered by the Lead in Construction standard. These activities are defined in the Act as follows:

ABATEMENT - Any set of measures designed to permanently eliminate lead-based paint hazards, including the removal of lead-based paint and lead-contaminated dust, the permanent containment or encapsulation of lead-based paint, the replacement of lead-painted surfaces or fixtures, and the removal or covering of lead contaminated soil; and all preparation, cleanup, disposal, and post abatement clearance testing activities associated with such measures. This Plan is not designed to cover lead abatement, as project-specific work plans and site-specific lead protection measures are necessary.

INTERIM CONTROLS – These are measures designed to reduce temporarily human exposure or likely exposure to lead-based paint hazards, including specialized cleaning, repairs, maintenance, painting, temporary containment, ongoing monitoring of lead-based paint hazards or potential hazards and the establishment and operation of management and resident education programs. All such activities conducted as part of a lead operations and maintenance program that implements specific interim controls are covered by 29 CFR 1926.62. This Plan covers worker protection for most interim control measures anticipated to be performed at Kennecott and other locations within WRST.

Alaska Lead Standard for Airborne Lead

Alaska Administrative Code provisions for lead in construction are essentially identical to the OSHA Lead in Construction Standard. This regulation specifically regulates worker exposure to lead during construction activities such as those performed at Kennecott. Under this regulation, the action limit for airborne lead exposure is $30 \mu\text{g}/\text{m}^3$ and the Permissible Exposure Limit (PEL) is $50 \mu\text{g}/\text{m}^3$. Both limits are time-weighted averages (TWA) over an 8-hour period. This regulation also includes requirements for exposure assessment, methods of compliance, respiratory protection, personal protective work clothing and equipment, housekeeping, hygiene facilities and practices, medical surveillance, medical removal protection, employee information and training, signs, recordkeeping, and observation of monitoring.

Surface Dust Limits

Although not a stated regulation of Alaska or federal OSHA, the agencies have established a maximum guideline for surface lead dust of $200 \mu\text{g}/\text{sq. ft.}$

Soil Dust Limits

Neither Alaska nor federal OSHA has established soil dust concentration limits for worker protection. Whenever workers are exposed for an 8-hour period to airborne dusts entirely derived from soils in which the soil lead concentration exceeds $3,000 \text{ mg}/\text{kg}$, it would be reasonable and prudent to assume, without any other contrary information, that the workers would be exposed at or above the OSHA action limit of $30 \mu\text{g}/\text{m}^3$. This is based on a calculation that at a soil lead concentration of $3,000 \text{ mg}/\text{kg}$, and a total airborne particulate concentration of dust derived from that soil of $10 \text{ mg}/\text{m}^3$ (the OSHA nuisance dust standard), approximately $30 \mu\text{g}/\text{m}^3$ of the total airborne dust would be comprised of lead. Of course, activities in which lead has been made into a finer powder (that would remain suspended in the air for a longer time) would likely exceed the OSHA airborne lead action level at a lower total soil lead concentration.

3.2 Environmental Protection Regulations

Alaska Administrative Code (18 AAC 75) regulates releases of lead to the environment in WRST. The Alaska Department of Environmental Conservation (ADEC) has established a regulatory limit of lead in soil of 1,000 milligrams per kilogram (mg/kg) for commercial or industrial sites.

Alternative cleanup levels may be proposed based on a site-specific risk assessment and a chemical speciation of the lead present at the site. Under the site-specific risk assessment, worker exposure may be evaluated through an approved model, conducted according to the Risk Assessment Procedures Manual, adopted by reference at 18 AAC 75.340.

4.0 HEALTH EFFECTS OF LEAD

4.1 *Routes of Entry*

When absorbed into the body in high doses, lead acts as a toxic substance. Lead can be absorbed into the body by inhalation (breathing) and ingestion (eating). Inorganic lead, such as that found at Kennecott, is not readily absorbed through intact skin. When lead is scattered in the air as a dust, such as during construction activities, it can be inhaled and absorbed through the lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through the digestive system if lead enters the mouth and is swallowed. Handling food, cigarettes, chewing tobacco, or make-up that have lead on them, or handling those items with hands contaminated with lead, will contribute to a worker's ingestion of lead.

A significant portion of the lead that is inhaled or ingested gets into the blood stream. Once in the blood stream, lead is circulated throughout the body and is stored in various organs and body tissues. Some of this lead is quickly filtered out and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in the body will increase if a person is absorbing more lead than the body is excreting. Lead stored in the body can slowly cause irreversible damage, first to individual cells, then to body organs, and finally to whole body systems.

4.2 *Effects of Overexposure to Lead*

Short-Term (Acute) Overexposure

Lead is a potent, systemic poison that serves no known useful function once absorbed by the body. In extremely large doses, a condition affecting the brain called acute encephalopathy may arise, which can cause seizures, coma, and death from cardiorespiratory arrest. A short-term dose of high levels of lead can lead to acute encephalopathy. Short-term occupational exposures of this magnitude are highly unusual.

Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease that may arise after periods of exposure as short as days or as long as several years.

Long-Term (Chronic) Overexposure

Chronic overexposure to lead may result in severe damage to the blood-forming, nervous, urinary, and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic, there may be severe abdominal pain.

Damage to the central nervous system in general, and the brain in particular, is one of the most serious forms of lead poisoning. The most severe, often fatal, form of brain damage (encephalopathy) may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy.

Chronic overexposure to lead may also result in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible.

Chronic overexposure to lead may impair the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence, and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses.

Children born of parents who were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood. Overexposure to lead also disrupts the blood-forming system, resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor, and fatigability as a result of decreased oxygen carrying capacity in the blood.

4.3 Worker Health Protection

Prevention of adverse health effects from lead requires that a worker's blood lead level (BLL) be maintained at or below 40 micrograms per deciliter (40 ug/dl) of whole blood. The BLL of workers (both male and female) who intend to have children should be maintained below 30 ug/dl to minimize adverse reproductive health effects to the parents and to the developing fetus. The measurement of BLL is the most useful indicator of the amount of lead being absorbed by the body.

BLL indicates the amount of lead circulating in the blood stream, but do not give any information about the amount of lead stored in the various tissues. BLL measurements merely show current absorption of lead, not the effect that lead is having on the body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between BLLs and various diseases. As a result, the BLL is an important indicator of the likelihood that a person will gradually acquire a lead-related health impairment or disease.

If the blood lead level exceeds 40 ug/dl, the risk of disease increases. There is a wide variability of individual response to lead, so it is difficult to say that a particular BLL in a given person will cause a particular effect. Studies have associated fatal encephalopathy with BLLs as low as 150 ug/dl. Other studies have shown some forms of disease in some workers with BLLs well below 80 ug/dl.

BLL is a crucial indicator of the risks to the health, but another extremely important factor is the length of time with elevated BLLs. The longer one has an elevated BLL, the greater the risk that large quantities of lead are being gradually stored in the organs and tissues (body burden). The greater the overall body burden, the greater the chances of substantial permanent damage. The best way to prevent all forms of lead-related impairments and diseases, both short- and long-term, is to maintain the BLL below 40 ug/dl. This Plan is designed with this end in mind.

The employer has prime responsibility to assure compliance with the provisions of the Standard. Workers have a responsibility to assist the employer in complying with this Plan.

4.4 Reporting Signs and Symptoms of Health Problems

Workers should immediately notify their supervisors if they develop signs or symptoms associated with lead poisoning. The worker shall be sent to a physician for evaluation, and a worker can obtain a second opinion by a physician of the worker's choice if the employer selected the initial physician.

5.0 PERSONNEL PROTECTION MEASURES

5.1 Site Health and Safety Supervisor

A Site Health and Safety Supervisor will be designated by NPS and shall act as the competent person regarding all lead-related activities. The Site Health and Safety Supervisor shall have the authority to immediately halt work if the provisions of this Plan are not met, and must be capable of identifying existing and predictable hazards or working conditions which are hazardous or dangerous to employees. Qualified medical personnel are available to advise the NPS and its employees on the health effects of employee lead exposure and supervise the medical surveillance program.

The Site Health and Safety Supervisor shall perform the following duties:

- Ensure all work is performed in compliance with the policies and procedures outlined in this Plan and applicable state and federal regulations;
- Record any illness, disease, injury, pulmonary disorder, or death of any person on site;
- Control entry and exit to the demarcated area;
- Supervise all air monitoring;
- Ensure that employees working within the demarcated area wear protective clothing and respirators as required by applicable regulations and this Plan. Following results of exposure assessments, decide to downgrade or upgrade PPE;
- Ensure that employees use the hygiene facilities and observe the decontamination procedures specified in this Plan;
- Ensure that engineering controls are functioning properly; and

- Perform safety recordkeeping.

5.2 *Lead Abatement Workers*

Lead abatement involves the intentional removal of lead-based paint to reduce or remove the lead content of the painted surface. Lead Abatement Work will only be performed at Kennecott by workers who have received the appropriate training and certification as Lead Abatement Workers. Protection of Lead Abatement Workers is outside of the scope of this Plan. Lead abatement work outside the scope of this Plan includes various tasks **specifically** to remove the lead-containing paints. Tasks incidental to construction/restoration activities such as minor pressure washing or wet scraping prior to repainting are not considered lead abatement activities, and are therefore within the scope of this Plan.

No one is permitted to perform work involving lead unless they have read and signed that they understand this Plan and that all reasonable questions have been answered. All persons working with lead at WRST are required to comply with all sections of this Plan.

6.0 **WORKER PROTECTION**

Significant lead exposures can arise from removing paint from surfaces previously coated with lead-based paint. Operations at Kennecott that might generate lead dust include use of heat guns, sanding, scraping and grinding of lead painted surfaces in repair, reconstruction, dismantling, and demolition work;

NPS has developed and implemented a lead worker protection program in accordance with OSHA regulations (29 CFR 1926.20 and 29 CFR 1926.62(e)). This program is essential in minimizing worker risk of lead exposure. Many projects may involve limited exposure, such as the removal of doors. Others may involve the removal of substantial quantities of lead-based paints on large buildings. The most effective way to protect workers from health effects of lead is to minimize exposure through the use of engineering controls and good work practices.

It is OSHA policy that respirators are not to be used in lieu of engineering and work practices to reduce employee exposures to below the PEL. Respirators can only be used in combination with engineering controls and work practices to control employee exposures.

OSHA's standard for lead in construction limits worker exposures to 50 micrograms of lead per cubic meter of air averaged over an eight-hour workday (40 averaged over a ten-hour day).

The following elements are included in the NPS program for protection of employees exposed to lead:

- Hazard determination, including exposure assessment;
- Engineering and work practice controls;
- Respiratory protection;
- Protective clothing and equipment;
- Housekeeping;
- Hygiene facilities and practices;
- Medical surveillance and provisions for medical removal;
- Training;
- Signs; and
- Recordkeeping.

6.1 *Respiratory Fit Testing Requirements*

All respiratory fit testing shall be performed in accordance with the NPS Respiratory Protection Program and 29 CFR 1910.134. All employees who are required to wear a respirator for their work, or are involved in the exposure assessment phase of this project, will be required to have fit-testing and a medical evaluation performed prior to their use of respiratory protection. Medical evaluations and fit-testing shall have been performed at least annually.

6.2 *Establishment of the Demarcated Work Area*

This section describes the requirements for demarcating work areas where the potential for lead exposure above the action limit exists and controlling access to those areas.

Demarcation

The following warning sign shall be posted in work areas where the exposure to lead exceeds or may exceed the lead PEL:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

Access to Demarcated Area

Access to the demarcated area will be limited to those personnel with work duties that require them to be present in the demarcated area. While within the demarcated area, all eating, drinking, smoking, chewing gum or tobacco, and applying of cosmetics shall be strictly prohibited.

All persons entering the demarcated area where activities exceed the lead action level of 30 µg/m³ shall wear appropriate personal protective equipment.

6.3 *Respiratory Protection and other Protective Equipment*

The requirements outlined in this section shall apply to all lead-based coating disturbance activities, excluding Lead Paint Abatement, where there is the potential for worker exposure to lead at or above the lead action limit. All activities involving respirator use shall comply with the Park's Respirator Plan.

All personnel performing work activities that might disturb lead paint shall wear the appropriate personal protective equipment. This equipment shall include, but not be limited to, coveralls or similar full body work clothing, gloves, hats, and boots. Employees shall wear 1/2-facepiece respirators with P100 filters or high efficiency particulate air (HEPA) filters as a minimum.

If manual cleanup of debris from activities involving lead-painted surfaces is to be performed, the following requirements shall apply. Until the exposure assessment determines worker exposure levels to be below the action level of 30 µg/m³ (8 hour TWA), all personnel performing the cleanup operations or in the vicinity of these operations shall wear the appropriate personal protective equipment. This equipment shall include, but not be limited to, coveralls or similar full body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields, vented goggles, or other appropriate eye protection. Until the exposure assessment determines the levels of exposure created by this operation, respiratory protection shall consist of, as a minimum, 1/2-facepiece respirators with P100 filters or high efficiency particulate air (HEPA) filters.

7.0 EXPOSURE ASSESSMENT

This section outlines the requirements for assessing if the work operations listed in this Plan result in an employee exposure to lead at or above the action level of 30 µg/m³.

For each workplace or work operation with lead exposure potential listed in Table 2-1, the NPS shall initially determine if any employee may be exposed to lead at or above the action level through the use of air monitoring. Personal samples shall be representative of a full shift including at least one sample for each job classification in each work area listed in this Plan.

7.1 *Protection of Employees during Exposure Assessment*

Personal Protective Clothing and Equipment during Exposure Assessment

Until the lead exposure assessment is complete, workers must use the required personal protective clothing and respirators.

Hygiene Requirements during Exposure Assessment

Until the exposure assessment is complete, where an employee may be exposed to lead above the action limit, the following procedures shall be implemented:

Change areas shall be provided and required to be used. Change areas shall be equipped with separate storage facilities for protective work clothing and equipment and for street clothes. These facilities shall prevent cross contamination. Each employee who enters a demarcated area during the exposure assessment shall not leave the workplace wearing any protective clothing or equipment that is required to be worn during the work shift, unless it has been decontaminated.

Hand washing facilities shall be provided and required to be used. Hand washing facilities shall be located near the entrance to the demarcated area, where possible, for access by employees who are required to work in the demarcated areas. On-site lavatories will suffice as hand washing facilities as permitted by site conditions and space limitations. If on-site lavatories are to be used, baby wipes or other equivalent pre-moistened disposable towelettes shall be provided outside side the demarcated area for employee use when exiting the demarcated area en-route to the on-site lavatories. Each employee who enters a demarcated area during the exposure assessment shall be required to wash their hands and face or wipe hands

and face using baby wipes upon leaving the demarcated area (after removing protective clothing and equipment) and before eating, drinking or smoking.

If it is determined that the workers are being exposed above the lead permissible exposure limit of 50 $\mu\text{g}/\text{m}^3$, a shower facility shall be provided.

7.2 Biological Monitoring during Exposure Assessment

Each employee who will be required to enter a demarcated area during the exposure assessment phase of the project will have the tests described in this section performed. Biological monitoring shall consist of blood sampling and analysis for lead and zinc protoporphyrin levels. Biological monitoring shall be made available within 48 hours of the onset of exposure. If air sample results are received within 48 hours and indicate exposure below the action level of 30 $\mu\text{g}/\text{m}^3$ for the activity monitored, biological monitoring will not be required.

If employees are exposed above the PEL or above the action level for 30 or more days during any consecutive 12 month period, regardless of respirator use, full medical monitoring shall be provided. This monitoring shall consist of the following:

- Blood sampling and analysis for lead and zinc protoporphyrin levels. This monitoring shall be required every two months for the first six months and every six months thereafter;
- A detailed work history and medical history with particular attention to past lead exposure, personal habits, and past gastrointestinal, hematologic, renal, cardiovascular, reproductive, and neurological problems;
- A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, neurological, and pulmonary systems;
- A blood pressure measurement;
- A routine urinalysis with microscopic examination; and
- Any laboratory or other test relevant to lead exposure that the examining physician deems necessary according to sound medical practice.

Each employee who has received blood monitoring shall be notified of the results within five working days of the receipt of the results by their employer. Each employee who has received full medical monitoring shall be provided with a copy of

the physician's written opinion within five working days of the receipt of the results by the NPS.

All medical monitoring and surveillance documents will be maintained by NPS for the duration of the employee's employment plus 30 years.

7.3 Training Requirements during Exposure Assessment

This section applies to each employee who will be required to enter a demarcated area. Information concerning the hazards associated with lead and any other chemicals used on site shall be communicated to employees according to the requirements of the Hazard Communication Standard (29 CFR 1910.1200). This information shall include, but not be limited to, the requirements concerning warning signs and labels, material safety data sheets, and the contents of this Plan.

In addition, all workers shall have been adequately trained on the hazards of lead through a lead awareness course. The information shall include the nature of the operations which could result in exposure to lead above the action level; the purpose, proper selection, fitting, use, and limitations of respirators; the medical surveillance program, medical removal protection program, adverse reproductive effects on both males and females and hazards to the fetus of exposure to lead; engineering controls and work practices associated with the employee's job assignment; the contents of this Plan; instructions that chelating agents should not routinely be used to remove lead from the body and should not be used except under the direction of a licensed physician; and the employee's right to access to all air monitoring records and his or her own medical records.

Employee training records will be maintained by NPS for the duration of each worker's employment plus 2 years.

7.4 Negative Initial Determination

If the exposure assessment determines that no employee is exposed to airborne concentrations of lead at or above the action level, a written record of this determination shall be made. This record shall include the activity monitored, personal protective equipment worn, date of determination, location within the work area, and the name and social security number of each employee monitored.

7.5 Frequency of Monitoring

If the exposure assessment reveals employee exposure to be below the action level for each activity, further exposure determination need not be repeated unless there

is a change of equipment, process, control, personnel, or a new task has been initiated that may result in additional employees being exposed at or above the action level. If there has been such a change, further monitoring will be required.

7.6 Positive Initial Determination

If the initial exposure assessments determine that employees are exposed to lead at or above the PEL of 50 $\mu\text{g}/\text{m}^3$, all aspects of this Plan, the following requirements shall apply:

- Air monitoring shall be performed on a quarterly basis. The monitoring will continue until at least two consecutive measurements, taken at least 7 days apart, are below the PEL, but above the action level. At that time air monitoring will be performed in accordance with Section 7.5;
- NPS may institute engineering controls in attempt to reduce exposures to below the PEL. If this option is chosen, all aspects of this plan shall apply;
- Workers must be informed in writing of their air monitoring results and told what engineering controls are being looked into to reduce their exposure to below the PEL;
- Lead warning signs shall be posted as required by this Plan; and
- Shower facilities shall be available on site for use by employees whose exposure exceeds the PEL. All employees will be required to shower upon exit of a demarcated area where the airborne exposure to lead exceeds the PEL.

7.7 Employee Notification

Within five working days after the completion of the exposure assessment, NPS shall notify each employee in writing of the results that represent that employee's exposure. Included with this notification will be a statement regarding what actions are being taken to reduce the exposures to below the PEL.

8.0 AIR MONITORING PROCEDURES

This section describes the procedures and requirements for air monitoring during lead disturbance activities.

8.1 Procedure

Personal samples shall be representative of a full shift including a representative sample for each job classification in the demarcated area. Samples shall be collected in the breathing zone of the workers being monitored. A representative sample shall include, at a minimum, 25% of the employees in each job classification be monitored. It is anticipated that no more than five workers will be involved in each activity, therefore, a minimum of one employee will be monitored for each representative task. If there is a change in conditions, work practices, or any other event that may result in individuals being exposed over the action limit, sampling will be repeated as described in this section.

Monitoring equipment to be used shall include the following:

- Personal sampling pump;
- 37 mm 2-piece filter cassette with a 0.8 µm mixed cellulose ester filter (MCEF);
- Appropriate tubing; and
- A rotameter capable of determining a flow rate range of 0.5 to 4.0 lpm.

Air sampling cassettes shall be worn outside of protective clothing and with the face orientated down to prevent airborne materials from settling in the cassette. All monitoring shall be performed according to NIOSH Method 7082 and collected on a sample data collection form.

All air monitoring and surveillance documents will be maintained by NPS for the duration of the employee's employment plus 30 years.

8.2 Area Monitoring

Area monitoring, if performed, shall be conducted for potential airborne coating debris and/or dust at locations upwind and downwind of the activity involving disturbance of lead-containing paint. If airborne levels of lead exceed the action limit the NPS will stop work until the problem is remedied. The procedure for area monitoring is consistent with Section 8.1.

9.0 HOUSEKEEPING

NPS shall implement the following housekeeping procedures during activities with the potential for exposures to lead above the action level.

- All surfaces shall be maintained as free as practicable of accumulations of lead or lead-containing materials;
- Clean-up of floors and other surfaces where lead accumulates shall wherever possible, be cleaned by HEPA-vacuuming, wet wiping, or other methods that minimize the likelihood of lead or lead-containing materials becoming airborne;
- Shoveling, dry or wet sweeping, and brushing may be used only where other methods have been tried and found not to be effective;
- Where vacuuming methods are selected, the vacuums shall be equipped with HEPA filters and used and emptied in a manner that minimizes the reentry of lead or lead-containing materials into the workplace; and
- Compressed air shall not be used to remove lead from any surface unless the compressed air is used in conjunction with a ventilation system designed to capture the airborne dust created by the compressed air.

10.0 COMPLIANCE PROGRAM

10.1 *Technology Considered in Meeting the Lead PEL*

If workers are found to be above the PEL following the exposure assessment, the following technology will be considered to reduce exposures to below the PEL:

- Natural airflow ventilation (outside activities);
- HEPA-filtered local exhaust ventilation;
- Forced airflow ventilation;
- Air-purifying respirators;
- Protective equipment and clothing; and
- Use of water mist to reduce airborne levels of lead-contaminated dusts.

10.2 *Implementation Schedule*

This Plan shall be effective upon the initiation of any work where the potential for exposure to airborne lead exceeds the action level of 30 μ g/m³ based on an 8-hour time-weighted average.

10.3 Work Practice Program

This Plan shall be considered the required work practice program.

10.4 Other Contractors on the Site

All contractors on site in the vicinity of areas where there is the potential for exposure to lead will be required to read and follow this Plan.

11.0 LEAD WASTE

11.1 Sampling and Testing of Debris

NPS is considered to be the generator of hazardous waste for this project and will be responsible for disposal of debris.

A representative sample of the waste, debris, disposable drop cloths, disposable clothing, waste water from decontamination or washing, etc., shall be collected in accordance with the requirements of SW-846 1311 and 6010 and tested by the Toxicity Characteristic Leachate Procedure (TCLP) in accordance with Appendix II of 40 CFR 261. At a minimum, the materials will be analyzed for lead.

In the case of wet methods of preparation, or containerized hygiene water, all liquids and sludge shall be tested, including the pH to determine corrosivity, if appropriate.

11.2 Waste Segregation, Accumulation, and Storage

NPS shall handle potentially lead-contaminated debris as such until laboratory testing indicates that it is not so designated. Although debris is not classified as hazardous waste until tested, the waste shall be handled as a hazardous material until it is determined to be non-hazardous.

Waste stored on-site determined to be hazardous waste in shall be properly containerized, labeled and stored within a demarcated area.

11.3 Treatment of Waste Determined to be General Debris

If the tests of the debris show the waste to be non-hazardous for the metals listed, all waste may be treated as general construction debris.

11.4 Treatment of Waste Determined to be Hazardous

If the tests of the debris show the waste to be hazardous for lead, the following requirements shall apply:

Paint chips and disposable protective clothing and other painted debris shall not be placed on the unprotected ground and shall be shielded to prevent dispersion of the debris by the wind or rain water.

Debris will be collected in storage containers in a manner that prevents releasing the removed lead into the environment. To prevent the release of lead into the air, water, or soil, potentially hazardous debris will be cleaned up frequently, typically once per day, and prevented from escaping the containment. The workers must be fully protected against breathing, ingesting or contacting any of the waste and debris.

Special attention shall be given to the labeling of the waste, time of storage, the amount of material stored at any one time, use of proper containers, personnel training, and confirmation that an EPA identification number will be obtained.

Debris considered to be hazardous will be stored in DOT 17-C or DOT 17-H metal drums, or other approved containers. Integrity of stored containers will be inspected weekly. Any signs of corrosion, rupture, spillage, or damage shall be noted and repaired. Storage of the waste at a temporary site must be according to 40 CFR Part 262, Subpart C.

NPS shall provide an emergency plan including: preparedness, prevention and contingency plans in accordance with 40 CFR 265 Subpart C and D for the steps to be taken in the event of an unplanned release or emergency.

Workers involved in the handling and storage of hazardous waste must have received training on how to perform their job duties in a manner consistent with the regulations. This includes Lead Hazard Awareness training as per the Hazard Communication Standard.

11.5 Transportation and Disposal of Hazardous Waste

If the tests of the debris show the waste to be hazardous for lead, the following requirements shall apply:

NPS shall arrange to have the hazardous waste transported from the site in accordance with the requirements of 40 CFR 263, and disposed of properly in

accordance with 40 CFR 264 and 268 including the necessary notifications and certifications with shipments.

12.0 SITE ACTIVITIES INVOLVING ASBESTOS

12.1 Objectives

The objective of this portion of the Plan is to develop a system for the proper management of ACM at the Kennecott Mine Town Site. The Plan provides a consistent approach for asbestos operations and maintenance activities by providing administrative and technical procedures that help to accomplish the following:

- Protect employees and the general public from inadvertent exposure to hazards of ACM that may arise from routine maintenance and repair work.
- Minimize future asbestos fiber release by controlling access to ACM.
- Permit the normal conduct of business while properly managing and maintaining ACM in place.
- Provide a system for ongoing evaluation and inspection of ACM that remain in the building.

This Plan will assist employees in deciding the proper response to a particular asbestos situations and define the appropriate administrative requirements for documenting asbestos-related activities. Additionally, this Plan is designed to:

- Implement asbestos management procedures to mesh with existing management and maintenance processes.
- Provide appropriate level of information to administration, management and employees so that each may be effective decision makers and responsible participants.
- Identify methods and procedures which define a standard of care for the Asbestos Program and which meet or exceed federal, state, and local regulations.
- Be a living document to accommodate revisions as regulations change or as additional technical procedures are added or as identified asbestos-containing building materials are removed or encased with new building materials.

12.2 Participation and Role Definition

The successful implementation of this Plan depends heavily on the active participation and interaction of those involved with the management and everyday operation of the Kennecott Mine Town Site. It is important that each participating party understand their role within this Plan. The following are definitions of the participant's projected roles within the Kennecott site.

A. Asbestos Program Manager (APM)

An APM, identified by name, shall perform the following duties:

- Overall responsibility for the total asbestos concerns as they relate to the Kennecott site.
- Estimate Plan costs and personnel required to implement this Plan.
- Track actual Plan costs, and allocate funding and personnel.
- Develop the Asbestos program implementation guidelines and ensure that the provisions of this Plan are implemented and adhered.
- Audit the Plan annually.
- Ensure that employees have received proper training in accordance with federal, state, and local regulations.
- Minimize disturbances of ACM by ensuring the awareness of employees within their shops and offices of the location of the materials and the administrative and technical procedures in this Plan.
- Ensure that all contractors and sub-contractors, vendors, temporary workers, and others that may come in contact with asbestos in the building, during the performance of their duties, are provided information regarding the locations of ACM and suspected or presumed ACM, based on the most current survey information.
- Ensure that required Alaska OSHA and EPA or local air authority notifications are provided regarding asbestos abatement activities and major fiber release episodes.

- Provide that all maintenance activities planning takes into consideration documented, assumed or presumed ACM.
- Ensure that as building maintenance employees perform day to day maintenance and/or custodial activities that they conduct periodic surveillance of the condition of ACM.
- Act as the Asbestos Designated Person in asbestos emergencies, with authorization to initiate any required action or responses necessary to prevent possible contamination of the environment and building spaces and/or protect building occupants from exposure to excessive airborne asbestos fiber concentrations or other health hazards in a timely manner.
- Ensure all emergency asbestos clean-up follows abatement procedures required by local, state and federal regulations.
- Ensure documentation and archival of all asbestos related information as required by state regulations.

B. Facilities Maintenance Employees

- Report observations on the condition of ACM as day to day maintenance activities are performed.
- Comply with proper asbestos related work practices.
- As requested, participate in the periodic program review and revise this Plan accordingly.

C. Contractors

- Responsible for relaying the information as to the presence and locations of ACM to their employees.
- Responsible to provide properly trained, certified (where required) and equipped staff if their job requires the disturbance of ACM.
- Required to notify and receive written approval from a representative of NPS prior to disturbing any amount of suspect ACM, assumed ACM, or documented ACM.

12.3 Administrative Procedures

This Plan includes the following administrative procedures:

- Asbestos surveys and the Plan are available to all concerned individuals for inspection.
- All employees are properly trained in asbestos awareness.
- ADEC notifications are provided regarding asbestos abatement activities and major fiber release episodes. Where there is a potential to disturb the ACM or impact them, Alaska OSHA regulations require that persons who may disturb such materials be notified of their presence. As part of the Plan, the APM shall ensure that the following personnel are notified of the presence of ACM and abatement work in the immediate vicinity:
 - Building maintenance and/or construction supervisor;
 - Facilities employees;
 - All building occupants in the area of the work;
 - Building occupants in the vicinity of the work; and
 - Building maintenance, repair, remodel or new construction contractors.

Other personnel who may disturb ACM through the course of their work duties (such as utility contractors, etc.) will be notified by the APM of the potential hazards and presence of ACM. Notification shall consist of issuance of an asbestos survey performed by an AHERA Building Inspector to the service contractor, receipt of which should be acknowledged in writing and filed. The outside service contractor is then required to keep a copy of the letter at the job site at all times.

13.0 ASBESTOS BACKGROUND INFORMATION

13.1 Asbestos Health Effects

Asbestos fibers can cause serious health problems. If inhaled, they can cause diseases which disrupt the normal functioning of the lungs. Three specific diseases; asbestosis (a fibrous scarring of the lungs); lung cancer; and mesothelioma (a cancer of the lining of the chest or abdominal cavity); have been linked to asbestos

exposure. These diseases do not develop immediately after inhalation of asbestos fibers; it may be 20 years or more before symptoms appear.

In general, as with cigarette smoking and the inhalation of tobacco smoke, the more asbestos fibers a person inhales, the greater the risk of developing an asbestos related disease. The majority of severe health problems resulting from asbestos exposure have been experienced by workers who held jobs in industries such as shipbuilding, mining, milling, and fabricating, where they were exposed to very high levels of asbestos in the air, without benefit of worker protections now afforded by law. These employees worked directly with asbestos materials on a regular basis and, generally, for long periods of time as part of their jobs. Even though exposure concentrations and duration are lower than those mentioned above, there is an increasing concern for the health and safety of construction, renovation, and building maintenance personnel, due to the possible periodic exposure to elevated levels of asbestos fibers while performing their jobs.

13.2 Location of ACM at the Kennecott Mine Town Site

ACM may be found throughout the Kennecott Mine Town Site in utilidors and the locations indicated in Table 13-2.

Table 13-2 -- Identified and Suspect ACM at Kennecott Mine Town Site

Building	Material and Location	Asbestos Type and Percent
West Bunkhouse	Pipe insulation (black cloth over hard white material) in utilidors	Chrysotile 10%; Amosite 25%
Power Plant	Soil/Debris from beneath building	Chrysotile 5%
Power Plant	Soil/Debris in trench of Generator Pit area	Chrysotile 5%
Machine Shop	Soil from beneath building under suspended pipes	Chrysotile <1% (not ACM)

13.3 Asbestos Regulations

Environmental Protection Agency Regulations

The EPA regulates pollution of the air and is interested in construction/renovation activities that can cause asbestos fibers to be released into the air. Asbestos fibers may remain in the air for people to breathe for some time after construction/renovation is finished. To reduce the airborne level of asbestos fibers, the EPA requires owners to use special techniques to remove building materials containing more than one percent asbestos before renovating or demolishing the

building. Special techniques include isolating the work area with plastic, removing the ACM while wet to reduce dust, and filtering the air from the work area through HEPA filters. EPA regulations are enforced in Alaska by ADEC.

Alaska OSHA

Alaska OSHA enforces worker health and safety regulations in Alaska. It regulates the concentration of asbestos to which a worker may potentially be exposed, and enforces the following OSHA PELs for airborne asbestos:

- 0.1 fibers per cubic centimeter - Maximum airborne level a worker may be exposed without respiratory protection averaged over an eight-hour time period.
- 1.0 fibers per cubic centimeter - Maximum airborne level a worker may be exposed without respiratory protection during any thirty-minute time period.

14.0 ASBESTOS ACTIVITIES AT KENNECOTT

14.1 *Planning for Projects*

Prior to proceeding with any maintenance or construction activities, the APM will identify any areas of potential asbestos disturbance. The APM will authorize asbestos abatement work as necessary. This Plan does not cover asbestos abatement activities, as those activities require specific work plans and site-specific health and safety planning.

14.2 *Repair Damaged Hard Mudded Asbestos-Containing Insulation*

These work procedures shall be followed when repairing small nicks or gouges in hard mudded asbestos-containing insulation on pipe runs in utilidors. It is assumed that the insulation surrounding the damage is in good condition.

Review and comply with Alaska OSHA and the ADEC notification requirements prior work. (Note: Notification may not be required where the pipe is simply wrapped with re-wettable lag cloth or metal lathe; however, where patching material is used there is more potential for fiber release and the project may be considered a regulated asbestos project).

Place 6-mil polyethylene sheeting over the floor in the area of work. Extend the plastic six feet in all directions. If the area to be repaired is one nick or gouge, a glove bag need not be used. Don personal protective equipment (disposable clothing and respirators).

Adequately wet the area to be repaired with amended water. HEPA vacuum the damaged area and any loose debris. Fill in the hole with non-ACM patching material. Dip lag cloth into water and squeeze out any excess water. Apply lag cloth over patch and smooth out using a sponge.

Upon successful clearance sampling, take down enclosure and dispose of as asbestos-containing waste.

14.3 *Accessing Utilidors*

NPS has a restricted access program to address the utilidors where asbestos-containing insulation is found. Entry is permitted only with approval and coordination of Facilities management to ensure that no person enters an unsafe situation.

Entry shall only be permitted during non-business hours, when possible. All persons working in utilidors in which asbestos has not been abated shall be trained for Class III activities.

14.4 *Cleanup of Debris from Minor Fiber Release*

The following procedures shall be used to clean up a small amount of debris from delaminated, abraded, or damaged surfacing material or pipe insulation. These procedures may be used by non-certified workers, provided that they have had asbestos awareness training and the damaged area is less than one square foot of material. If more than one square foot of asbestos-containing material is disturbed, the work must be performed by certified asbestos workers. If the disturbance is more than three square feet a certified asbestos supervisor is required and abatement procedures must be in conformance with OSHA 29 CFR 1926. Air monitoring shall be conducted in accordance with the procedures and strategies outlined in this Plan.

Review and comply with OSHA and the ADEC notification requirements prior to work.

Task must be performed in a non-occupied, regulated area.

The door to the room in which the work is being performed shall be shut and posted with a sign stated the room is closed.

If the work is taking place in a common area, the area should be cordoned off with appropriate caution tape and posted with warning signs.

Don protective clothing and respirators.

Adequately wet debris to be cleaned up using amended water.

Pick up any large pieces of debris and place into disposal bags. Use HEPA vacuum and wet wiping to clean up small debris and dust.

Wet wipe or HEPA all surfaces in the affected area.

Repair damage using appropriate work practices.

Remove the disposable coveralls by rolling downward so that clothing is turned inside-out as it is removed. Place the removed disposable coveralls in the center protective floor sheeting in the regulated area.

Still wearing respirator, thoroughly wipe hair, face and hands with disposable wet cloths. Pay special attention to the area around the edge of the respirator at the respirator-face seal.

Remove respirator and wash hands and face thoroughly with disposable wet cloths.

Wash the respirator and remove the filter cartridges (if not going directly to another work area). Place the filter cartridges in the disposal bag and place the respirator in the proper storage place where it can dry and not deform its shape. If going directly to another work area, wet-wipe the respirator and cover the filter openings with duct tape. Place respirator with filter cartridges into a sealable plastic bag for storage.

Perform Clearance air monitoring as described in the Air Monitoring Section.

14.5 Disposal of Asbestos-Containing Waste Materials

The following procedures shall be followed when disposing of asbestos-containing waste material in accordance with the National Emissions Standards for Hazardous Air Pollutants (NESHAP) and ADEC.

- Adequately wet all asbestos-containing waste materials.
- After wetting, seal all asbestos-containing waste material in leak tight containers to ensure that they remain adequately wet when deposited at a waste disposal site (minimum two layers of 6-mil poly or 2 bags).
- Label each container with an asbestos warning sign as specified by the Alaska OSHA, or the Occupational Safety and Health Administration, Department of Transportation, and ADEC.
- Ensure that the exterior of each container is free of all asbestos residue.
- Exhibit no visible emissions during any of the operations required by this section.
- Immediately after sealing, each leak-tight container shall be permanently marked with the date the material was collected for disposal, the name of the waste generator, and the address at which the waste was generated. This marking must be readable without opening the container.
- All asbestos-containing waste material shall be deposited within ten calendar days after collection for disposal at an approved waste site.

Complete landfill/waste site documentation procedures as follows:

Delivery unit driver and unloading personnel supervisor must sign the transportation manifest and disposal forms.

The landfill/waste site operations observer signs the disposal form acknowledging that the debris was unloaded into the pre-dug trench or hole and that all required precautions, required procedures and personal protective equipment was utilized.

The landfill/waste site weighing scale operator, landfill/waste site owner or other authorized representative, enters the scale weigh on the manifest and disposal form/s and signs his name to these documents.

A copy of the signed manifest and disposal forms are to be incorporated into both the building and the project records.

14.6 Prohibited Activities

All activities where airborne concentrations of asbestos that exceed or can reasonably be expected to exceed the PEL prescribed in 29 CFR 1926.1101 (in excess of 0.1 fiber per cubic centimeter of air (0.1 f/cc) as averaged over an eight-hour time-weighted average (TWA) or 1.0 fiber per centimeter of air (1 f/cc) averaged over a sampling period of thirty minutes) are prohibited by workers who are not certified Alaska Abatement Workers.

These prohibited activities include any that may impact, disturb or cause vibration which may disturb ACM. In particular, the following activities are prohibited:

- Drill holes in ACM;
- Hang plants or pictures on structures covered with ACM;
- Sand, grind, or otherwise abrade asbestos-containing vinyl floor tiles, vinyl floor sheeting, floor mastics or cove base mastics;
- Damage ACM while moving furniture or other objects;
- Install curtains, drapes, lights or dividers in such a way that they may damage ACM;
- Dust floors, ceilings, moldings or other surfaces in asbestos-contaminated environments with a dry brush or sweep with a dry broom;
- Use an ordinary vacuum to clean up asbestos-containing debris;
- Remove ceiling tiles below ACM without wearing the proper respiratory protection, clearing the area of other people, and observing asbestos removal waste disposal procedures;
- Remove ventilation system filters dry; and
- Shake ventilation system filters.

15.0 INCIDENT AND EMERGENCY PROCEDURES FOR ASBESTOS

Special emergency procedures are needed in the event of a situation which may cause an immediate release of airborne asbestos fibers. The goal is to protect

human health by limiting, to the extent possible, contamination of the building and surrounding environment.

If an individual causes or discovers an asbestos fiber release situation, expedient, yet controlled, actions must be taken. It is difficult to outline all of the possible scenarios that may be encountered and provide a step by step action plan for each. It is the intent of this section of the Plan to provide generalized "first response" guidelines to be used before assessment and evaluation of the situation by asbestos management professionals.

Situations may be considered:

- An asbestos incident if it involves the disturbance of a small amount of ACM in a small localized area.
- An asbestos emergency if it involves the disturbance of a large amount of ACM or a catastrophic occurrence (such as a large scale fire or earthquake).

The decision to consider an incident as an emergency situation will be a judgment call on the part of the APM. Notifications of emergency asbestos conditions and asbestos incidents should be made.

An emergency situation is an occurrence which disturbs ACM so as to cause an immediate visible release of asbestos fibers into the air which may cause contamination of the building environment. Examples include:

- Improperly planned or executed renovation activities;
- Construction procedures or equipment causing excessive vibrations such as coring, jack hammering, or vibrations from other mechanical construction devices;
- Water damage from roof leaks, pipe breaks, or other means; and
- Earthquake, explosion, structural failure or other catastrophic building movements.

In the event of an incident where asbestos or potential asbestos-containing material is disturbed, immediately initiate the following procedures:

- Don't panic; take a calm orderly approach.

- Stop work activities. Do not attempt to clean up the debris. Improper cleaning may actually create a greater hazard.
- If the material is in an area where other individuals may come into contact with it, secure the area to restrict access prior to calling for assistance.
- If possible, close the door to the space where the disturbance occurred; otherwise rope off or barricade the area.
- If the material is in an area where there is a direct air current blowing across it (adjacent to a fan, near return air ducts, etc.) shut down the HVAC if possible, or close off vents to the contaminated area prior to calling for assistance.
- The next step is to make the emergency asbestos notification. The APM will provide a hazard assessment and specific direction. Then contact the supervisor.
- Report the location and type of material disturbed, the activity that created the disturbance, the time the disturbance occurred, and any actions taken.

The APM will mobilize certified asbestos workers to respond with remediation and air monitoring.

- After the contaminated area has been isolated and the activity causing the contamination corrected (if feasible), emergency abatement procedures may need to be implemented. Such abatement will be conducted under the direction of by a Certified Asbestos Abatement Contractor using Certified Asbestos Workers supervised by a Certified Asbestos Supervisor.
- The air handling system in the affected area shall remain shut down until airborne asbestos fiber concentrations are measured to be below 0.01 fiber per cubic centimeter.
- Until the contaminated area has been checked and air monitoring indicates that airborne fiber concentration is below a level acceptable to the APM, no employee, occupant or tenant will enter the area.
- If people must enter the area, these individuals must be properly trained and protected personnel (certified asbestos workers).

16.0 WORK PRACTICES FOR ASBESTOS

Compliance with rules and safe work practices ultimately depend on individual performance. Therefore, all employees should be aware of and adhere to the following caveat.

When in doubt about the possible asbestos impact of the task:

- Stop Work,
- Contact the supervisor or other reliable source of asbestos information to determine whether work can proceed safely, and
- Continue work only when the safety of self and others is assured.

17.0 WORKER PROTECTION FOR ASBESTOS

17.1 *Respiratory Protection Program*

Employees who may periodically be exposed to asbestos contaminated environments above 0.1 fiber/cc or whose duties may require removal, or repair of ACM or may work in direct contact with ACM shall be included in the NPS Respiratory Protection Program administrated by the NPS Safety Officer. The type of respiratory protection is dependent upon the type of work activity, conditions, and potential contaminant to the respirator. Where reasonable engineering controls cannot minimize respiratory hazards, respiratory protection equipment shall be used by all Kennecott site occupants, vendors and contractors working in these asbestos contaminated or potential asbestos contaminated areas.

17.2 *Approved Respirators*

The following respirators are approved for use during the operations listed in this Plan.

Type of Respirator	Protection Factor	Permissible Exposure Limit	Maximum Concentration Allowed
Half face, negative pressure respirator	10	0.1 f/cc	1 f/cc
Full face, negative pressure respirator	50	0.1 f/cc	5 f/cc
PAPR -or- supplied-air respirator, continuous flow mode	100	0.1 f/cc	10 f/cc
Full face, supplied-air	1000	0.1 f/cc	100 f/cc

respirator, pressure demand mode			
Full face, supplied-air respirator, pressure demand mode, with either escape SCBA or escape HEPA provision -or- SCBA	> 1000	0.1 f/cc	> 100 f/cc

18.0 AIR MONITORING FOR ASBESTOS

This section describes under what work conditions air monitoring is required and how to determine sampling locations and quantities while performing activities involving ACM. The purpose of the air monitoring plan is to gather information on asbestos exposures for occupants and workers in facilities in which asbestos-containing building materials are present.

18.1 *Sampling and Analytical Methods*

The NIOSH 7400 Polarizing Light Microscopy (PCM) Protocols will be used for asbestos air samples collected at Kennecott.

18.2 *Sampling Frequency and Location*

For employees who disturb ACM, OSHA requires that both long-term (work shift) Time Weighted Average (TWA) personal samples and Short Term Excursion Limit (STEL) (30 minutes) samples should be collected during days when their work tasks are likely to cause elevated exposures. Representative samples shall be conducted for these activities. If concentrations approach or exceed the occupational permissible exposure limit (0.1 f/cc) and there is more than one source of elevated exposure during the work shift, then shorter-term personal sampling at each specific operation involving contact with ACM may be needed to determine and remedy the major sources of exposure. Careful notation should be made concerning the work locations, the work activities performed, and their duration during each sampling interval.

Sampling need only be conducted when activities are causing or are likely to cause exposures to exceed the permissible exposure limits (8-hr TWA or 30 minute STEL). Generally, this means that exposure monitoring is performed per the requirements of the procedure being conducted. Should permissible limits be approached during the work activity, additional monitoring may be warranted.

18.3 Sampling Volumes

The NIOSH 7400 protocol recommends obtaining a density of 100 to 1,300 fibers per square millimeter (f/mm²) on the surface of the filter. The volume required to achieve the density will vary depending on the fiber concentration; at a fiber concentration of 0.01 f/cc, the volume of air required to obtain the recommended density is 3,860 liters. Reduce the sampling volume to 1,350 liters due to the common problem of overloading with particulate matter in dusty environments.

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