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U.S. Army Toxic and Hazardous Materials Agency
Report of Sampling and
Analysis Results

Herminie Army Housing Units
Herminie, Pennsylvania

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**SAMPLING AND ANALYSIS AT THE U.S. ARMY
FAMILY HOUSING UNIT (FHU) PROPERTY
HERMINIE, PENNSYLVANIA**

TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	iii
SECTION 1. INTRODUCTION	1
1.1 PURPOSE AND SCOPE	1
1.2 SITE DESCRIPTION	1
1.3 REPORT ORGANIZATION	2
SECTION 2. ASBESTOS-CONTAINING MATERIALS	3
2.1 SAMPLING RATIONALE	3
2.2 FIELD ACTIVITIES AND OBSERVATIONS	3
2.3 LABORATORY PROCEDURES AND RESULTS	5
2.4 CONCLUSIONS AND RECOMMENDATIONS	7
SECTION 3. AIRBORNE ASBESTOS ASSESSMENT	14
3.1 SAMPLING RATIONALE	14
3.2 FIELD ACTIVITIES AND OBSERVATIONS	14
3.3 LABORATORY PROCEDURES AND RESULTS	15
3.4 CONCLUSIONS AND RECOMMENDATIONS	16
SECTION 4. SUMMARY OF FINDINGS	18

LIST OF TABLES

TABLE 2.1	BULK SAMPLE SUMMARY, HERMINIE FAMILY HOUSING	8
TABLE 2.2	ASBESTOS CONTAINING MATERIALS, HERMINIE FAMILY HOUSING.	10
TABLE 3.1	RESULTS OF AIRBORNE ASBESTOS SAMPLING AND ANALYSIS ..	17

LIST OF APPENDICES

APPENDIX A.	ASBESTOS SUPPORTING DATA
A.1	FIELD DATA, ASBESTOS SAMPLING
A.2	LABORATORY DATA, ASBESTOS SAMPLES

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**TABLE OF CONTENTS
(Continued)**

**LIST OF APPENDICES
(Continued)**

- APPENDIX B. AIRBORNE ASBESTOS SUPPORTING DATA**
B.1 FIELD DATA, AIRBORNE ASBESTOS SAMPLING
B.2 LABORATORY DATA, AIRBORNE ASBESTOS SAMPLING

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EXECUTIVE SUMMARY

The U.S. Army family housing units (FHUs) at Herminie, Pennsylvania were inspected by Roy F. Weston, Inc. (WESTON) personnel during March 1990 to further evaluate the environmental concerns identified in the enhanced Preliminary Assessment Reports prepared and submitted earlier by Argonne National Laboratory (ANL) for the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). Three of the 16 single-family "Capehart" housing units were examined on 07 March to investigate the possible presence of asbestos-containing materials (ACM). An assessment of airborne asbestos exposure was performed at one unit on this property on 18 April 1990 by a WESTON Certified Industrial Hygienist (CIH), because asbestos fibers were detected in the dust deposited within the ductwork of the heating system.

The ANL Draft Sampling and Analysis Plan, Revision 1 (SAP) specified sampling the following materials, where present, which are suspected to contain asbestos, from ten per cent of the housing units or a minimum of three housing units, whichever is greater.

- Pipe run insulation.
- Dust accumulated inside heating ductwork within the concrete slab, where present and open.
- Vinyl floor tiles.

The WESTON personnel selected three housing units for inspection after review of maintenance records and drawings, discussions with housing management personnel, and determination that the units were in similar condition. The housing units chosen, Nos. S-060, S-066, and S-070, were considered to be representative of the other 13 units, but this was not confirmed by an examination of all the units.

Twelve dust samples, 17 samples of floor tile, six samples of attic pipe run insulation, one sample of an expansion joint, and one exhaust duct insulation sample were collected by WESTON and analyzed. These analyses revealed that asbestos is present in dust accumulated within the heating ductwork, floor tile, duct insulation, and in pipe run insulation at the three housing units examined. Asbestos was found in ten of the 12 dust samples by transmission electron microscopy (TEM) and in at least two samples from each unit. Asbestos was quantified at 1% or greater by polarized light microscopy (PLM) in 15 of the floor tile samples, and was qualitatively identified in one other sample by TEM. One additional floor covering sample was found to contain asbestos by PLM at less than 1%. Asbestos was found at 20% in the sample of exhaust duct insulation but no asbestos fibers were detected in the expansion joint sample by PLM. Asbestos was found at or greater than 1% in all six pipe run insulation samples by PLM. During the asbestos sampling activity, no other suspect materials were observed.

The following practices should be observed with regard to the known and suspected asbestos-containing materials identified:

- The friable asbestos-containing pipe run insulation in the attic is located in an inaccessible area and may be left in place as long as it is not disturbed. However, an Operations and Maintenance (O&M) Plan must be developed and implemented. This program must describe the locations of all known ACM, procedures for its maintenance, repair and removal, and

personnel responsible for its implementation. The O&M program must remain in force until such time as all ACM is removed from the facility.

- The risks posed by the asbestos-containing dust in the ductwork cannot be clearly evaluated, because the sampling and analysis program only included a qualitative screening of this material since no approved quantitative procedure exists. Further studies, such as air sampling were recommended to determine if asbestos is becoming airborne and to define what risks, if any, are presented by these findings. These studies were subsequently performed and the findings are presented in this report.
- The vinyl floor tiles pose no significant risk as long as they are in good condition and are not damaged by excessive wear or misuse. They should be managed in place under an O&M program which describes procedures for the regular inspection of the floor coverings and the removal and replacement of any that become damaged.
- The exhaust duct insulation should be left in place and managed under an O&M program as long as they are in good condition, but should be removed or replaced during the next renovation or prior to demolition.

Samples for airborne asbestos were collected from four floor vents, one located in each of the living room, kitchen, bedroom, and bathroom, in an unoccupied unit which had been inspected previously. The air samples were subjected to analysis by TEM to identify and quantify any asbestos fibers collected. The sample volumes collected resulted in detection limits for air airborne asbestos fiber concentrations of <0.005 fibers per cubic centimeter (f/cc). No airborne asbestos fibers were detected at this FHU property, using sampling techniques designed to simulate the worst-case concentration likely to be encountered.

SECTION 1. INTRODUCTION

**SAMPLING AND ANALYSIS AT THE U.S. ARMY
FAMILY HOUSING UNIT (FHU) PROPERTY
HERMINIE, PENNSYLVANIA**

SECTION 1. INTRODUCTION

Roy F. Weston, Inc. (WESTON) was retained by Argonne National Laboratory (ANL) to provide assistance in gathering additional environmental data for the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) at 53 family housing unit (FHU) properties in 12 states. The Herminie, Pennsylvania property is one of these FHUs.

1.1 PURPOSE AND SCOPE

The purpose of this project was to provide the Department of the Army with sound environmental data on the properties which are scheduled for sale or realignment as a result of the Defense Authorization Amendments and Base Closure and Realignment Act (Public Law 100-526). Environmental assessments of each property covered by the Act are required by the Secretary of Defense prior to their closure or realignment. Such actions must be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA) to ensure that any environmental hazards will be identified and mitigated where required.

Previously, ANL conducted enhanced preliminary assessments (PAs) for each property. These enhanced PAs made recommendations regarding sampling and analysis to determine (1) whether and in what quantities asbestos is present in certain building construction materials (including pipe run insulation, dust accumulated in heating ductwork, vinyl floor tile, and exterior siding shingles, where present), (2) in selected contexts, whether and in what concentration soils and groundwater may be contaminated, and (3) whether and in what range transformer oils at selected sites may contain polychlorinated biphenyls (PCBs). WESTON gathered this data by implementing ANL's Draft FHU Sampling and Analysis Plan, Revision 1 (SAP). Subsequent to the initial studies, WESTON, ANL, and USATHAMA decided that a follow-up effort was required to determine if asbestos fibers were becoming airborne from the dust in the heating system. This study was implemented, and samples were collected to evaluate any risks to occupants from this source.

1.2 SITE DESCRIPTION

The Department of the Army's FHU property in Herminie, Pennsylvania consists of 16 single-family, three-bedroom "Capehart"-style housing units located on 11.87 acres. Surrounding areas are wooded with some agriculture and a scattering of private residential properties.

The units were constructed in 1959 on concrete slab foundations with no basements or crawl spaces. The ducts for the original heating system and domestic water lines were embedded in the concrete slab, which was covered with vinyl floor tile. The units have pitched roofs surfaced with asphalt shingles and exteriors finished with wood siding.

1.3 REPORT ORGANIZATION

This report contains the results of the sampling and analysis program performed by WESTON. Section 2 contains a description of the asbestos sampling performed at the property and laboratory results for samples of suspected asbestos-containing material (ACM) collected. Copies of field notes and laboratory results pertaining to asbestos are provided in Appendices A.1 and A.2. Section 3 presents a description of the field sampling activities and results of the analyses for airborne asbestos fibers. Field notes and copies of the laboratory reports for this effort are presented in Appendices B.1 and B.2, respectively. Section 4 is a summation of all activities and findings for the Herminie FHU.

SECTION 2. ASBESTOS-CONTAINING MATERIALS

SECTION 2. ASBESTOS-CONTAINING MATERIALS

WESTON personnel inspected three of the 16 "Capelhart" units at the Herminie family housing facility on 07 March 1990 for the presence of suspected ACM. Vinyl floor tile, pipe run insulation, dust accumulated within the heating ductwork, expansion joint, and exhaust duct insulation were the only suspect materials found within the buildings that were sampled. All sampling was done following the requirements of ANL's SAP. Additionally, all field work was performed in accordance with applicable Federal regulations, including 40 CFR Part 61 Subpart M, 40 CFR Part 763 Subpart E, and 29 CFR Part 1910.1001.

2.1 SAMPLING RATIONALE

The sampling rationale used by WESTON for this project followed the recommendations set forth by ANL. The type of suspect ACM to be sampled, the number of housing units to be examined at each FHU facility, and number of samples to be taken for each material found were described in the SAP. The plan for Herminie required sampling of the following materials, if present:

- Pipe run insulation.
- Accumulated dust inside heating ductwork if not sealed.
- Vinyl floor tiles.

In accordance with the SAP, three units were examined at this facility. The sampling plan, however, did not identify specific units which were to be sampled. The task of determining which housing units were representative of the facility as a whole and, therefore, would be sampled was left to the discretion of the WESTON field team. After reviewing all available maintenance records and drawings and discussing the facility with Directorate of Engineering and Housing (DEH) personnel, it was determined that all of the units at the Herminie FHU were similar in condition. Units S-060, S-066, and S-070, were chosen by the WESTON field team leader as representative units to be sampled.

The SAP specifies that a minimum of two pipe run insulation samples, four dust samples, and one sample of each color of floor tile be collected from each of the housing units examined. Twelve dust samples, six pipe run insulation samples, 17 samples of vinyl floor tiles, one expansion joint sample, and one exhaust duct insulation sample were collected at the facility.

2.2 FIELD ACTIVITIES AND OBSERVATIONS

Each of the units was inspected to determine if suspect materials were present. The samples of the pipe run insulation were retrieved from the attic using disposable coring devices with a one-half inch diameter tube, designed such that each coring device also serves as the sampling container. Before the coring tool was inserted, the materials to be sampled were moistened to prevent asbestos fibers from becoming airborne. The coring device was placed in its outer sample container and secured by a tight fitting lid. The containers were labeled with sample numbers, and shipped to the lab. The sampling tools were wiped clean with a damp cloth and all debris resulting from the sampling activities as collected and placed into plastic bags. The small bore hole was sealed with an encapsulant.

Two samples of pipe run insulation were taken from the attic of each unit. The pipe run insulation is friable, as defined in the Environmental Protection Agency (EPA) regulations, meaning that it can be crushed, crumbled, pulverized, or otherwise reduced to a powder using hand pressure. Friable ACM is considered to be more hazardous than non-friable ACM since it is much more likely to release asbestos fibers. Because of its friability and instances of damage, the pipe run insulation is considered to be the most hazardous type of ACM in the Herminie FHU. However, its inaccessible location in the attic lessens the possibility of damage and risk to occupants.

Heating ductwork vents in the units were not sealed, so dust samples were collected by wiping the inner surface of the duct near the designated exhaust vents with a fiber-free wipe selected for its ability to trap dust in a non-fibrous matrix. Each wipe was placed in the jaws of a flexible small parts pick-up tool and moistened with fiber free water. The grille was then removed and the tool inserted into the duct opening. The interior surface was wiped to collect dust on the moistened surface of the wipe. After the dust was gathered, the wipe was placed in a small plastic wide-mouth jar, sealed, labeled with the sample number, and shipped to the lab. The grille was then replaced and the tool was cleaned by rinsing and wet wiping the surfaces prior to collecting the next sample. Samples were collected from the living room, bedroom, kitchen, and main bathroom in all three units.

Seven colors, red, gray, gray-green, black, red with white streaks, white, and off-white of 9" x 9" vinyl floor tile and two colors, brown and gray-green, of 12" x 12" vinyl floor tile were sampled. All three units contained gray and black 9" x 9" vinyl floor tile. Units S-70 and S-66 both contained gray-green and off-white 9" x 9" floor tile. Units S-70 and S-60 contained white 9" x 9" floor tile. One sample of each of the floor tile types was taken in each housing unit, resulting in a total of 17 samples for laboratory determination of asbestos content. These samples were taken by breaking off a small piece of floor tile in an inconspicuous location. About one square inch of the tile surface area was taken for each sample. No effort was made to separate the mastic, which sometimes contains asbestos, from the floor tile samples themselves.

The vinyl floor tile in all three of the units inspected was in good condition. This material is considered to be a non-friable type of ACM, unless damaged. If significant damage occurs, such that the material becomes friable as defined in the asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP), the EPA would classify these tiles as friable materials. However, an EPA interpretation was recently released that changes certain previous interpretations regarding non-friable ACM. On 23 February 1990, a memorandum was written by the Director of Emissions Standards Division, the Director of Stationary Source Compliance Division, and the Associate Enforcement Counsel for Air Enforcement of the EPA Office of Air Quality Planning and Standards (OAQPS). This memorandum was circulated to other air quality officials and EPA regional offices in early March 1990. This latest position states that floor tiles and certain other non-friable materials do not have to be removed from a facility prior to demolition, unless they are severely damaged and thus are considered friable, or unless the demolition may cause fiber release through grinding or abrasion of the tiles. Floor tile removal shall be done if demolition is to be accomplished by burning, either of the unit or of the debris from demolition. However, if the floors in the housing units are to be renovated, special care must be taken during the process to prevent the release of asbestos fibers.

The WESTON field team was directed, as a part of the project scope contained in the SAP, to perform sampling and analysis of specific suspect ACM. Other suspect materials sampled were an expansion joint on a heating unit and cementitious exhaust duct insulation. These suspect materials were sampled in only one unit, but were observed in the other two units inspected. Copies of the field notes are included in Appendix A.1.

2.3 LABORATORY PROCEDURES AND RESULTS

The bulk samples of building materials were analyzed for asbestos content by WESTON's optical microscopy laboratory in Auburn, Alabama. This laboratory is accredited by the American Industrial Hygiene Association (AIHA) and the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP). The bulk samples were analyzed by Polarized Light Microscopy (PLM) using the EPA's "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA 600/M4-82-020, December 1982. Copies of the laboratory reports are included in Appendix A.2.

Vinyl floor tile samples for which no asbestos was found using PLM methods and wipe samples of dust accumulated within heating ductwork were analyzed qualitatively for the presence of asbestos by Transmission Electron Microscopy (TEM) at WESTON's NVLAP accredited electron microscopy laboratory in Auburn, Alabama. Copies of these laboratory reports are also included in Appendix A.2.

All analyses were performed in accordance with protocols set forth in the Laboratory Accreditation package submitted by WESTON under NVLAP. This document includes standard procedures for sample analysis and quality assurance / quality control (QA/QC) which were acceptable to NIST. The QA/QC protocols for the laboratory differ significantly from those commonly found in chemical analysis procedures, due to the nature of the analytical procedure. Since there are no reagents, digestions, or other steps in the process that provide significant opportunities for sample contamination or analyte loss, lot blanks and sample spikes are not performed. Instead, all analyses are performed using the following steps:

- Incoming samples are divided into lots of ten for analysis.
- One sample is selected at random to serve as the QC check and divided into two containers.
- The sample lot is assigned to an analyst who determines the asbestos content of each sample.
- The QC sample is analyzed by a different analyst, designated by the sample custodian.
- The results of both analysts are submitted to the QC Coordinator for review, and comparison to the laboratory QC chart.
- The results are reviewed and approved, based on the written QC review procedures, or rejected. If rejected, the sample lot and QC sample are reanalyzed.

The WESTON laboratory routinely runs blank checks to ensure that equipment and refractive index oils are not contaminated, collects and analyzes samples of the air in the work areas to document that airborne asbestos fibers do not threaten worker health or contaminate samples, and analyzes samples submitted by NIST

to document precision of results as required by the NVLAP program. Samples provided in past rounds of proficiency checks are used for analyst training and to document analyst proficiency. The use of third party laboratory comparisons is often done, and is accomplished by sending duplicates of samples to an outside laboratory and comparing the results obtained by the two facilities.

In interpreting the asbestos results, it should be noted that the definition of asbestos presence differs between the EPA and some state agencies. According to the EPA definition, any materials that contain greater than one per cent (>1%) asbestos are classified as ACM by the 1977 NESHAP regulations. However, California has recently implemented state regulations that consider all materials containing 0.1 per cent or more asbestos as asbestos-containing. It is believed that several other states will soon follow the lead of California in lowering the threshold limit to 0.1 per cent, including some in which properties under review in this study are located. Currently, the State of Pennsylvania continues to abide by the EPA definition, hence, all samples containing >1% asbestos are considered to be ACM.

The matter is further complicated by the fact that the PLM method was developed specifically for friable materials, but not for non-friable types of suspect ACM such as vinyl floor tiles, vinyl sheeting, and siding. In fact, no specific method has been developed and promulgated to date for such samples, so laboratories use PLM as the only available documented procedure for their analysis. PLM has an inherent limitation on fiber resolution of about 0.25 micrometer (um) in diameter, while reliable detection and quantification of fibers smaller than 1 um in diameter is difficult. The manufacturing process for vinyl floor tiles, for example, often produces the very small fiber diameters which cannot be seen by PLM. WESTON's experience is that frequently such samples do, in fact, contain significant quantities of asbestos. WESTON has developed a qualitative technique using TEM to detect the presence of such small fibers and minimize false negatives in the laboratory results. This technique, however, does not allow a good quantitative estimate of asbestos content.

For these reasons, the WESTON laboratories have implemented a policy of reporting asbestos presence as follows:

- Asbestos determined by PLM to be present at greater than 1% is reported as the quantity detected.
- If asbestos is estimated to be less than 1% by PLM, it is reported as "<1%". This estimate of asbestos content may be made when only one asbestos structure is observed.
- If asbestos is not detected in certain non-friable materials by PLM, then the samples are subjected to TEM analysis. The results are reported as positive if asbestos is detected by TEM.

Recommendations made in this report are based on the >1% regulatory limit, except for floor tiles as discussed earlier and except as otherwise noted. However, all samples in which asbestos was detected are discussed. This represents a conservative approach to the assessment of asbestos presence at the facility.

Table 2.1 contains a summary of all samples collected at the Herminie FHU, including sample locations, material descriptions, and laboratory results. PLM results are quantitative while TEM results are qualitative. Quantity estimates for materials sampled that were suspected to contain asbestos are presented in Table 2.2. The field notes describing the observations are provided in Appendix A.1, while copies of the original laboratory reports are included as Appendix A.2.

All six samples of pipe run insulation were found to contain the chrysotile type of asbestos in a friable form at concentrations at or greater than 1% using the PLM technique for analysis. Based on these observations, the pipe run insulations should be considered to contain asbestos.

Fifteen of the floor tile samples were found by PLM to contain asbestos at or greater than the 1% level. WESTON considers the 1% value reported for Sample BU-489-27-PA-S60-AFT and eight additional samples which contain this amount to be sufficient to define the samples as asbestos-containing, due to the analytical uncertainty of the PLM method when applied to floor tiles, as discussed previously. One other sample was found by PLM to contain asbestos, but at a concentration of <1%. One sample for which no asbestos was reported following PLM analysis, was found to contain asbestos fibers by the TEM procedure. While this result is qualitative in nature, consideration of the process through which floor tiles were manufactured leads to the conclusion that this material should be treated as ACM. Thus, all 17 of the floor tile samples were found to contain asbestos. The 13 units not inspected should be considered to have ACM present in the floor tiles unless additional sampling and analysis is performed and shows that no asbestos is present in these units.

Analytical results for the dust samples taken from the heater ductwork indicate that this dust contains some asbestos fibers. Qualitative TEM analyses revealed the presence of asbestos in ten of the 12 dust samples. Samples from each unit had detectable asbestos fibers. These data lead to the conclusion that asbestos is found in the dust trapped by the heating ducts.

The one sample of exhaust duct insulation was found by PLM to contain asbestos at a concentration of 20%. No detectable asbestos fibers were found in the expansion joint sample by PLM.

2.4 CONCLUSIONS AND RECOMMENDATIONS

The sample analyses performed by WESTON have revealed that asbestos is present in most floor tile samples collected in the three housing units examined, in pipe run insulation samples, in exhaust duct insulation, and that the dust inside the heater supply ducts contains asbestos. These units are thought to be representative of the other 13 at the site, but this was not confirmed by sampling all units.

Analytical results of the pipe run insulation confirmed that asbestos is present in all six of the samples taken. This insulation is located in the attic above the ceiling, and may be left in place as long as the attic is not used for storage and the insulation is undisturbed. If the material is left in place an Operations and Maintenance (O&M) Plan should be developed and implemented. An O&M plan must address the following:

- The locations of all known and suspected ACM.
- The procedures and frequency for periodically assessing the ACM in the facility.
- The procedures for safely handling the ACM during maintenance or removal activities.

TABLE 2.1
BULK SAMPLE SUMMARY
HERMINIE FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	ASBESTOS CONTENT PLM ANALYSIS	CONFIRMATION TEM ANALYSIS
=====				
Unit S70				

BU462-27-PA-S70-AFT	Red 9" x 9" floor tile	Kitchen	Chrysotile, 1%	
BU463-27-PA-S70-AFT	Gray 9" x 9" floor tile	All bedrooms/Bath 1/ Bath 2/Hall/Living room	Chrysotile, 3%	
BU464-27-PA-S70-AFT	Gray-green 9" x 9" floor tile	Living room/Bath 2	Chrysotile, 1%	
BU465-27-PA-S70-AFT	Black 9" x 9" floor tile	All bedrooms/Hall/ Living room	Chrysotile, 2%	
BU466-27-PA-S70-AFT	Red 9" x 9" floor tile	Hall	Chrysotile, 1%	
BU467-27-PA-S70-AFT	White 9" x 9" floor tile	Bath 1/Hall	Chrysotile, 2%	
BU468-27-PA-S70-AFT	Off-white 9" x 9" floor tile	Bath 1	Chrysotile, 1%	
BU469-27-PA-S70	Expansion joint	Htr room	None Detected	
BU470-27-PA-S70-ATD	Dust within ductwork	Kitchen	---	Positive
BU471-27-PA-S70-ATD	Dust within ductwork	Living room	---	Positive
BU472-27-PA-S70-ATD	Dust within ductwork	Bath 2	---	Positive
BU473-27-PA-S70-ATD	Dust within ductwork	Bedroom 1	---	Negative
BU474-27-PA-S70-API	Pipe run insulation	Attic	Chrysotile, 5%	
BU475-27-PA-S70-API	Pipe run insulation	Attic	Chrysotile, 10%	
Unit S66				

BU476-27-PA-S66-AFT	Brown 12" x 12" floor tile	Kitchen/Bath 1/Bedroom 1	Chrysotile, 1%	
BU477-27-PA-S66-AFT	Gray-green 9" x 9" floor tile	Hall/Living room/Bath 2/ Bedroom 3	Chrysotile, <1%	
BU478-27-PA-S66-AFT	Gray 9" x 9" floor tile	Living room/Bedroom 2/ Bedroom 3/Hall	Chrysotile, 8%	
BU479-27-PA-S66-AFT	Black 9" x 9" floor tile	All bedrooms/Hall/ Living room	Chrysotile, 10%	
BU480-27-PA-S66-AFT	Off-white 9" x 9" floor tile	Hall	Chrysotile, 1%	
BU481-27-PA-S66-ATD	Dust within ductwork	Living room	---	Negative
BU482-27-PA-S66-ATD	Dust within ductwork	Bath 2	---	Positive
BU483-27-PA-S66-ATD	Dust within ductwork	Bedroom 2	---	Positive
BU484-27-PA-S66-ATD	Dust within ductwork	Bath 1	---	Positive
BU485-27-PA-S66-API	Pipe run insulation	Attic	Chrysotile, 1%	
BU486-27-PA-S66-API	Pipe run insulation	Attic	Chrysotile, 8%	
BU487-27-PA-S66	Furnace exhaust duct	Attic	Chrysotile, 20%	

TABLE 2.1
BULK SAMPLE SUMMARY
HERMINIE FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	ASBESTOS CONTENT PLM ANALYSIS	CONFIRMATION TEM ANALYSIS
=====				
Unit S60				

BU488-27-PA-S60-AFT	Brown 12" x 12" floor tile	Hall	None Detected	Positive
BU489-27-PA-S60-AFT	Gray-green 12" x 12" floor tile	Living room/Kitchen/Hall	Chrysotile, 1%	
BU490-27-PA-S60-AFT	Black 9" x 9" floor tile	All bedrooms/Hall/ Living room	Chrysotile, 15%	
BU491-27-PA-S60-AFT	Gray 9" x 9" floor tile	All bedrooms/Bath 1/ Bath 2/Living room/Hall	Chrysotile, 12%	
BU492-27-PA-S60-AFT	White 9" x 9" floor tile	Bath 2	Chrysotile, 1%	
BU493-27-PA-S60-ATD	Dust within ductwork	Living room	---	Positive
BU494-27-PA-S60-ATD	Dust within ductwork	Kitchen	---	Positive
BU495-27-PA-S60-ATD	Dust within ductwork	Bath 2	---	Positive
BU496-27-PA-S60-ATD	Dust within ductwork	Bedroom 2	---	Positive
BU497-27-PA-S60-API	Pipe run insulation	Attic	Chrysotile, 4%	
BU498-27-PA-S60-API	Pipe run insulation	Attic	Chrysotile, 4%	

TABLE 2.2
ASBESTOS CONTAINING MATERIALS
HERMINIE FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	QUANTITY	UNITS

Unit S70				

BU462-27-PA-S70-AFT	Red 9" x 9" floor tile	Kitchen	70	Square ft
BU463-27-PA-S70-AFT	Gray 9" x 9" floor tile	All bedrooms/Bath 1/ Bath 2/Hall/Living room	773	Square ft
BU464-27-PA-S70-AFT	Gray-green 9" x 9" floor tile	Living room/Bath 2	20	Square ft
BU465-27-PA-S70-AFT	Black 9" x 9" floor tile	All bedrooms/Hall/ Living room	38	Square ft
BU466-27-PA-S70-AFT	Red 9" x 9" floor tile	Hall	11	Square ft
BU467-27-PA-S70-AFT	White 9" x 9" floor tile	Bath 1/Hall	3	Square ft
BU468-27-PA-S70-AFT	Off-white 9" x 9" floor tile	Bath 1	1	Square ft
BU470-27-PA-S70-ATD	Dust within ductwork	Kitchen	N/A	
BU471-27-PA-S70-ATD	Dust within ductwork	Living room	N/A	
BU472-27-PA-S70-ATD	Dust within ductwork	Bath 2	N/A	
BU474-27-PA-S70-API	Pipe run insulation	Attic	10	Linear ft
BU475-27-PA-S70-API	Pipe run insulation	Attic	10	Linear ft
Unit S66				

BU476-27-PA-S66-AFT	Brown 12" x 12" floor tile	Kitchen/Bath 1/Bedroom 1	244	Square ft
BU477-27-PA-S66-AFT	Gray-green 9" x 9" floor tile	Hall/Living room/Bath 2/ Bedroom 3	60	Square ft
BU478-27-PA-S66-AFT	Gray 9" x 9" floor tile	Living room/Bedroom 2/ Bedroom 3/Hall	566	Square ft
BU479-27-PA-S66-AFT	Black 9" x 9" floor tile	All bedrooms/Hall/ Living room	38	Square ft
BU480-27-PA-S66-AFT	Off-white 9" x 9" floor tile	Hall	9	Square ft
BU482-27-PA-S66-ATD	Dust within ductwork	Bath 2	N/A	
BU483-27-PA-S66-ATD	Dust within ductwork	Bedroom 2	N/A	
BU484-27-PA-S66-ATD	Dust within ductwork	Bath 1	N/A	
BU485-27-PA-S66-API	Pipe run insulation	Attic	10	Linear ft
BU486-27-PA-S66-API	Pipe run insulation	Attic	10	Linear ft
BU487-27-PA-S66	Furnace exhaust duct	Attic	8	Square ft

TABLE 2.2
ASBESTOS CONTAINING MATERIALS
HERMINIE FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	QUANTITY	UNITS
=====				
Unit S60				

BU488-27-PA-S60-AFT	Brown 12" x 12" floor tile	Hall	5	Square ft
BU489-27-PA-S60-AFT	Gray-green 12" x 12" floor tile	Living room/Kitchen/Hall	90	Square ft
BU490-27-PA-S60-AFT	Black 9" x 9" floor tile	All bedrooms/Hall/ Living room	38	Square ft
BU491-27-PA-S60-AFT	Gray 9" x 9" floor tile	All bedrooms/Bath 1/ Bath 2/Living room/Hall	889	Square ft
BU492-27-PA-S60-AFT	White 9" x 9" floor tile	Bath 2	8	Square ft
BU493-27-PA-S60-ATD	Dust within ductwork	Living room	N/A	
BU494-27-PA-S60-ATD	Dust within ductwork	Kitchen	N/A	
BU495-27-PA-S60-ATD	Dust within ductwork	Bath 2	N/A	
BU496-27-PA-S60-ATD	Dust within ductwork	Bedroom 2	N/A	
BU497-27-PA-S60-API	Pipe run insulation	Attic	10	Linear ft
BU498-27-PA-S60-API	Pipe run insulation	Attic	10	Linear ft

- Designation of an asbestos coordinator for the facility.
- The responsibilities and requirements for training of personnel involved with maintenance and renovation of the facility.
- The record-keeping program for the facility.

The asbestos dust accumulated within the heating ductwork represents an unusual problem, since the source of this asbestos is not readily apparent, and the quantity is not precisely known. As a conservative approach, the heating ductwork located within the concrete slab should be cleaned or permanently sealed when the units are renovated. Since the heating systems are currently operational, sealing the floor vents will require replacement with attic ducts and ceiling vents, or provisions of an alternate heating source. If the ducts are cleaned, a high-powered vacuum cleaner equipped with a high-efficiency particulate air (HEPA) filter should be employed, since other vacuum cleaners are not capable of trapping all of the small asbestos fibers that may be present.

The source of the asbestos in the ducts cannot be positively determined, due to the sampling and analysis procedures employed. However, there are several potential sources, based on observations at the numerous facilities inspected during this project. Units, presumed to be the original heaters, found at other facilities frequently contained an expansion joint which served to isolate the return air plenum from the heater itself, preventing the transmission of vibrations and noise to the ductwork. The fabric-like material used to form this joint was determined, in some cases, to be chrysotile asbestos in a nearly pure form. It is possible, even likely, that the heating systems in these units had similar expansion joints which have been removed. During the 25 to 30 years that the original units were in service, erosion of these joints was likely, and could have caused asbestos fibers to accumulate in the dust.

Another possibility is that residual debris from the removal of vinyl-asbestos floor tiles, such as was found in other sites, may have been left in the ducts during floor tile removal and replacement. Conversations with the TEM analysis indicate that there was some evidence of chlorine observed during the identification of the asbestos fibers by X-ray dispersion analysis in samples from some sites. The most likely source of this element, considering the site history, is the vinyl chloride polymer which forms the floor tile matrix. However, other asbestos sources, such as debris imported into the facilities from outside activities of the occupants, cannot be ruled out.

The vinyl floor tiles in the three housing units inspected were in good condition, but, should they become broken or damaged, asbestos fibers may be released. The recent EPA clarification of the definition for damaged non-friable materials apparently removes some concerns about the status of these materials at the time of renovation or demolition. Inspection of these normally non-friable materials prior to demolition is required, but, if they are in good condition at the time, they may be left in place as long as planned demolition procedures will not release a significant amount of asbestos fibers. However, if demolition will subject these non-friable materials to grinding, sanding, or abrading, or if demolition involves burning of the structure or debris from the structure, all forms of ACM, including these floor tiles, must be removed in advance.

The vinyl floor tiles should be left in place and managed under an O&M plan. The floor tiles should be removed during a planned renovation of the units, in accordance with the regulations applicable at the time. As an alternative, removal of these materials at present may be desirable, since the regulatory status of the material may be changed in the future.

Each of the heating systems in the three units inspected contained cementitious exhaust duct insulation. The sample of this material, collected from Unit S-066, was determined to contain chrysotile asbestos. When these types of materials become damaged, air flow can cause erosion of the exposed surfaces, generating airborne asbestos fibers. The recommended method for managing this risk is removal of the material, using procedures that comply with state and Federal regulations, and replacement with a non-asbestos substitute.

Although expansion joints on the heating units and exhaust duct insulation were the only other suspect materials sampled, care should be taken during renovations or demolition to identify suspect materials that may have been hidden from the view of the assessment team. The suspect materials observed by the field team, and any hidden suspect materials found later, should be analyzed for the presence of asbestos prior to being disturbed.

SECTION 3. AIRBORNE ASBESTOS ASSESSMENT

SECTION 3. AIRBORNE ASBESTOS ASSESSMENT

Sampling for airborne asbestos fibers was performed at one unit of the Herminie, Pennsylvania FHU on 18 April 1990 by WESTON. Dr. Leonard Nelms, a Certified Industrial Hygienist (CIH) visited the site and collected the samples using procedures described in the Asbestos Hazard Emergency Response Act (AHERA). These procedures were designed for verifying that clean-up of a contained area, following completion of an asbestos abatement action in public schools, was adequately performed. All samples were analyzed by TEM following the protocols specified in AHERA.

3.1 SAMPLING RATIONALE

WESTON followed the procedures and guidelines set forth during discussions among ANL, USATHAMA, and WESTON staff members, to provide a fast-track field sampling program and rapid analysis of samples collected. The urgency of this effort was driven by the finding that asbestos fibers were a component of the dust contained in the sub-slab ductwork of a number of the installations. The approach chosen required that the WESTON CIH collect four samples of air from selected heating registers, generally from one vent in each of the living room, kitchen, bedroom, and bathroom.

Air samples were to be collected in one unoccupied unit at the site while the heating system was operating, to simulate the worst possible case for exposure of occupants. The vacant unit selected was to be one of those from which dust within ducts had been sampled during the initial investigations, where possible. If no unit that had been sampled previously was vacant at the time, another unit was to be chosen from among those available, and samples of dust from the ducts were to be collected. These samples were to be collected after completion of sampling for airborne fibers, using the procedures employed previously. Unit S-70 was selected at the Herminie site, since it was vacant and had previously been sampled.

3.2 FIELD ACTIVITIES AND OBSERVATIONS

The sampling activities at this site were performed during the morning, on a cool spring day. The diaphragm pumps were unpacked, placed in the selected sampling locations, and turned on as soon as possible after arrival at the site to allow the mechanical components to warm up prior to checking flow rates. Since there was no floor duct in the kitchen of this unit, a sample was taken from the second bedroom instead. The heating system was turned on as soon as the pumps were in operation, to allow the air flow to stabilize, since it had not been in operation recently.

A test filter cassette, identical to those used for sample collection, was placed on the pump system being calibrated and the airflow into the filter was measured using a calibrated rotameter. This followed AHERA requirements and good industrial hygiene (IH) sampling protocols. After the pumps were calibrated, a sampling cassette made of an electrically conducting plastic was attached to the sample line, placed directly over the heating register to be sampled, and securely held in place with duct tape. The cassette contained a 25 mm diameter mixed cellulose ester (MCE) membrane filter, having a nominal pore size of 0.45 μ m. The time at which sample collection was begun was recorded and the air was sampled for approximately three hours.

The pumps were operated for a length of time sufficient to draw about 1,600 liters (L) of air through each filter, based on the initial daily calibration. At the expiration of this time, the filter cassettes were removed from the heating register, inverted while the airflow continued, and lightly tapped to dislodge any fibers that may have adhered to the cowl of the cassette. Then, the cassettes were carefully removed from the sampling pump, resealed with the plugs and end caps that are a part of the cassettes, and labeled. The flow rate of each pump was again determined by exactly the same procedure used prior to the start of sample collection. After all sampling was completed, the heating system was returned to the same condition and setting that was found on entry to the unit.

The volume of air drawn through each filter was calculated, based on the average sample flow rate and the duration of sample collection, and recorded on the cassette label. Each cassette was then sealed in a anti-static plastic zipper-seal bag and placed in a shipping carton with a custom-designed anti-static foam liner. All sampling equipment, samples and other gear were then removed from the unit and the site was secured prior to departure.

Samples were collected from the four interior locations selected. In addition, a background sample of ambient outside air was taken near the entry door to the kitchen and a field blank was prepared. No significant problems were encountered during the sample collection activities.

During the sampling effort the facility was examined to identify any potential sources of asbestos that may be responsible for the asbestos fibers found in the dust. The heating system has a black-coated finely woven expansion joint that appeared to have been in place for some time. This type of material sometimes contains asbestos. The heating ducts themselves are a cementitious material that may contain asbestos.

3.3 LABORATORY PROCEDURES AND RESULTS

Samples were shipped to the laboratory soon after collection by common carrier. The four samples of air from within the unit were analyzed by WESTON's NVLAP-accredited TEM facility, using the sample preparation and analytical procedures set forth in the EPA AHERA method. A section of the exposed filter was cut from each sample and three wedges were placed on copper wire grids for TEM mounting. The samples were etched in a plasma asher, which also destroyed some of the organic materials that may have been collected, and vacuum-coated with a thin layer of carbon, embedding the fibers that were on the filter surface. Each carbon-coated grid was placed in a Jaffe wick washer, in which the MCE filter matrix was dissolved and wicked away, leaving behind the carbon film containing any asbestos fibers collected. The grids were then examined and found to be ready for analysis.

Once the sample grids were prepared, each grid was examined by the TEM protocols of AHERA. A specified number of grid openings were scanned looking for fibers that may be asbestos. Typically, between six and ten grid openings had to be examined to comply with the detection limit of 0.005 fibers per cubic centimeter (f/cc) set forth in the regulations. Whenever a fiber was observed during this examination, the microscopist examined its morphology and determined its elemental composition from the emitted X-ray spectrum. If these indicated that it may be an asbestiform mineral, the crystal lattice structure was examined by observation of its electron diffraction pattern. The fiber was then classified either by the type of asbestos determined to be present during the analysis, or as a non-asbestos fiber.

The results for the four samples from inside Unit S-70 are presented in Table 3.1. No asbestos fibers were detected in any of these samples at a limit of detection that was between 0.004 and 0.005 fibers per cubic centimeter (f/cc). Based on these findings, the background sample and field blank were not examined, since no fibers were detected inside the unit.

3.4 CONCLUSIONS AND RECOMMENDATIONS

The air samples collected indicate that asbestos fibers from the dust found within the heating system ductwork are not being released in significant quantities at this facility. The airborne asbestos concentration was lower than the detection limit and below the AHERA threshold. The limits of detection were <0.004 f/cc, which is at or below the acceptability limit set forth in AHERA for clearance of an abatement area in a school, and were far lower than the OSHA Permissible Exposure Limit (PEL) for workers of 0.2 f/cc.

While asbestos has been shown to pose a health risk to humans at high fiber concentrations, there are no definitive studies that indicate that a risk is associated with low-level airborne exposures such as the 0.005 f/cc AHERA limit. Therefore, sampling and analysis for airborne asbestos at this site did not reveal any health risk to the occupants of the houses, based on the TEM analyses of the samples collected. However, it is recommended by the U.S. Army Environmental Hygiene Agency (AEHA) that, if the units are to remain under the management, operational control, or ownership of the Army, additional sampling and analysis for airborne asbestos be undertaken. These studies should be performed to provide data from at least ten percent or a minimum of three of the housing units, whichever is greater. This additional sampling and analysis effort, along with the other recommended actions, will help to ensure that there is no long-term exposure risk to the occupants or to maintenance personnel.

TABLE 3.1. RESULTS OF AIRBORNE ASBESTOS SAMPLING AND ANALYSIS
HERMINIE, PENNSYLVANIA FAMILY HOUSING UNITS
(ALL VALUES IN FIBERS/CC)

SAMPLE NUMBER	SAMPLE LOCATION	ASBESTOS IN DUST	ASBESTOS CONCENTRATION	ASBESTOS TYPE FOUND
S-70-LR	Living Room	YES	ND <0.004	ND
S-70-KI	Kitchen	YES	ND <0.004	ND
S-70-BR	Bedroom	NO	ND <0.004	ND
S-70-BA	Bathroom	YES	ND <0.004	ND

ND = Not Detected at the Limit of Detection Cited.

Note: The asbestos in all dust samples was chrysotile.

SECTION 4. SUMMARY OF FINDINGS

SECTION 4. SUMMARY OF FINDINGS

Sampling and analyses performed at the Herminie, Pennsylvania FHU reveal the presence of several issues of concern from an environmental standpoint. The most significant are the detection of asbestos in 10 of the 12 dust samples, in all six pipe insulation samples, in all of the 17 samples of floor tile, and in the cementitious furnace exhaust duct of one unit.

The following practices should be observed with regard to the known and suspected asbestos-containing materials identified:

- While the general condition of the friable asbestos-containing pipe insulation in the attic is good and it is in an inaccessible location, it can be damaged if disturbed or mishandled during maintenance activities. This material should be repaired as needed and managed under an O&M Plan as long as it remains in place and undisturbed. When removal of this material and replacement with an asbestos substitute is done, trained personnel should be utilized and state and Federal regulations, must be followed.
- The vinyl floor coverings pose no significant risk as long as they are in good condition and are not damaged by excessive wear or misuse. They should be left in place and managed under an O&M program which describes procedures for the regular inspection of the floor coverings and the removal and replacement of any that become damaged.
- The non-friable exhaust duct for the furnace located in Unit S-066 presents no significant risk as long as it is in good condition and not damaged. It may be left in place and managed under the O&M program as described above until it is either replaced during renovations or removed from the unit prior to demolition.
- Additional sampling and analysis for airborne asbestos at this site is recommended by AEHA, if the units are to remain under the management, operation control, or ownership of the Army. These studies should be performed to provide data from at least ten percent or a minimum of three of the housing units, whichever is greater.

The air monitoring performed in Unit S-70 indicated that no detectable asbestos was being emitted in air from dust collected in the heating ducts. The detection limit of the method, <0.005 f/cc, is below the AHERA limit and well below the OSHA PEL of 0.2 f/cc.

APPENDIX A.1. FIELD DATA, ASBESTOS SAMPLING

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01

FACILITY/BLDG. NO. Hermine Family Housing, Unit 570

FACILITY CONTACT Sandy Ricketts TELEPHONE NUMBER (412) 777-1231

TECHNICIAN NAME Michael Kindley SIGNATURE Michael Kindley

TECHNICIAN NAME Rolf Erga SIGNATURE Rolf Erga

TIME ARRIVED 0955 TIME DEPARTED 1125 DATE 07/Mar/90
dd mm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

Arrived at DEN at 0800. Sandy Ricketts is still sick today, so John Fratta will accompany us today.

The houses chosen at Hermine were selected based on the availability of the occupants being at home on the day we were at the site. Vacant buildings were surveyed whenever possible. Sandy Ricketts, DEN Housing Manager, said that all the units were similar except for some minor repairs. Unit 570 is currently vacant.

Unit 570 is a three bedroom Capehart-style unit, with wooden shingles on outside walls, and tar shingles on roof. Inside floors are covered by vinyl flooring; walls and ceilings are plaster board. All pipes below the attic are bare of insulation. There is an expansion joint in furnace, but it could not be sampled without cutting a hole in the material. It is the same type of expansion joint that Mr. Fratta said wasn't suitable containing. Later, however, a spot was found to take a sample of the expansion joint, so one was taken to insure positive identification of the material.

ACTIVITY CHECKLIST

Interviews Completed	<u>N.</u>	Number of Samples	<u>14</u>
Drawings Reviewed	<u>N.</u>	Survey Form Completed	<u>Yes</u>
Drawings Attached	<u>Yes</u>	Site Log Completed	<u>Yes</u>
Visual Inspection	<u>Yes</u>	Chain-of-Custody Initiated	<u>Yes</u>
Number of Photos	<u>2</u>	Exp. Assess. Form Init.	<u>Yes</u>
Q.A. Check ☒	SIGNATURE <u>Michael Skolnicki</u>	DATE <u>21 MAR 90</u>	dd mm yy

SITE SURVEY LOG

(Continued)

There two pipe runs (4" in diameter) in the attic covered by a gray, a wall-type insulation. No joint insulation. Aircell simply butted against each other. Cloth wrap on top of aircell. Pipes are obscured from view by blown-in attic insulation.

Seven floor tiles, one expansion joint, four dust, and two pipe run samples taken in Unit 570.

Returned to unit at 1500 to check for dust material noted in Units 566 and 560. The same material is also in Unit 570. It is a hard, cementitious material around exhaust duct or vent.

ASBESTOS SURVEY DATA

0855

BLDG. NO.: 151710

INSTALLATION 01217

TASK TEAM MEMBERS

Michael Kradley

Rolf Erga

W.O. No. 2104-13-01

CLIENT: ARGONNE NATIONAL LAB

BLDG. NAME: Hermine Family Housing - Unit 570

DATE (dd/mm/yy): 07/03/90

BLDG. DESCRIPTION: Cupboard

TIME ARRIVED: 0155

ITEM NO.	LAB SAMPLE NO.	BASE NO.	STATE	UNIT NO.	SAMPLE CODE	AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
1.	B1041612	-217	-FIA	-5170	-A1F1	KITCHEN	1710	-	111616E	011
2.	B1041613	-217	-FIA	-5170	-A1F1	LIVING ROOM	1713	-	111616F	012
3.	B1041614	-217	-FIA	-5170	-A1F1	LIVING ROOM	1240	-	111616A	013
4.	B1041615	-217	-FIA	-5170	-A1F1	LIVING ROOM	1318	-	111701B	014
5.	B1041616	-217	-FIA	-5170	-A1F1	HALL	1111	-	111701C	015
6.	B1041617	-217	-FIA	-5170	-A1F1	BATH	1113	-	111701D	016
7.	B1041618	-217	-FIA	-5170	-A1F1	BATH	1111	-	111701E	017
8.	B1041619	-217	-FIA	-5170	-A11	HALL	1111	-	111701F	018
9.	B1041710	-217	-FIA	-5170	-A1T0	KITCHEN	1111	-	1111	019
10.	B1041711	-217	-FIA	-5170	-A1T0	LIVING ROOM	1111	-	1111	020
11.	B1041712	-217	-FIA	-5170	-A1T0	BATH	1111	-	1111	021
12.	B1041713	-217	-FIA	-5170	-A1T0	BEDROOM	1111	-	1111	022

(Continued)

NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Red 9" x 9" floor tile. Slight damage.
02	Gray 9" x 9" floor tile. Also in Bath 1, Bath 2, Bedroom 1, Bedroom 2, Bedroom 3, and Hall.
03	Gray-green 9" x 9" floor tile. Also in Bath 2.
04	Black 9" x 9" floor tile. Also in Bedroom 1, Bedroom 2, Bedroom 3, and Hall. Occurs in clusters.
05	Red 9" x 9" floor tile with white streaks.
06	White 9" x 9" floor tile. Also in Hall.
07	Off-white 9" x 9" floor tile.
08	Expansion joint. Woven material. Quantity = each.
09	Dust in Joints.

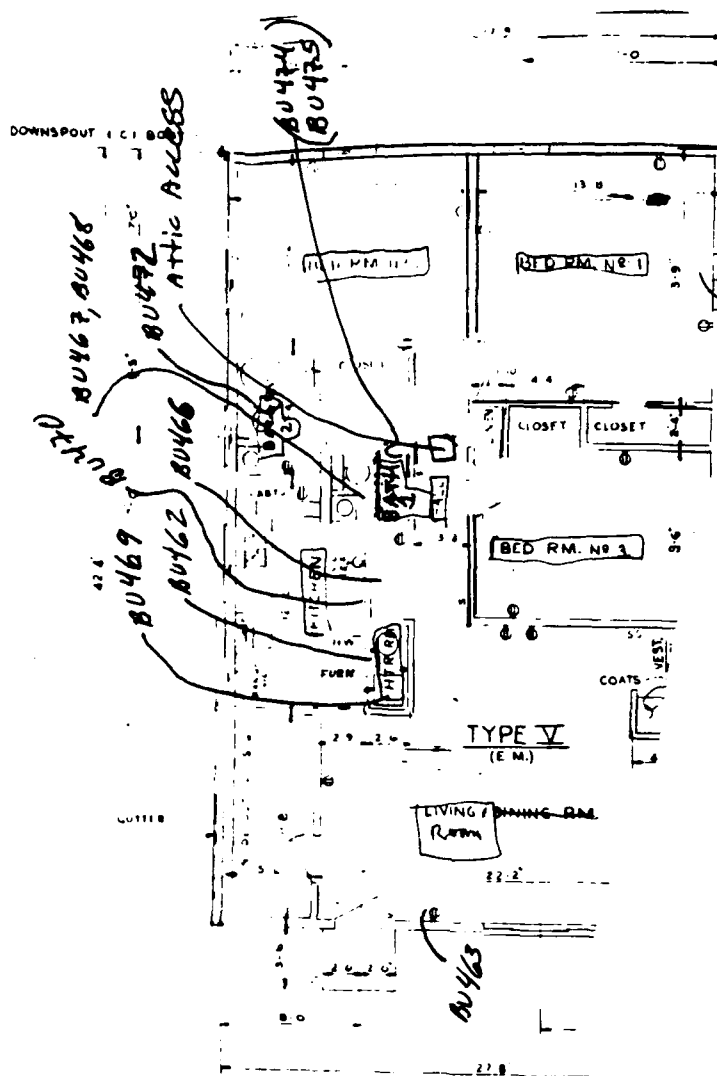
TECHNICIAN
SIGNATURE

Michael Kradley

QUALITY ASSURANCE
SIGNATURE

Michael Skofnicki

WESTON



UNIT S-70

Herminie, PA

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01
 FACILITY/BLDG. NO. Merminis Family Housing Unit 566
 FACILITY CONTACT Sandy Ricketts TELEPHONE NUMBER (412) 777-1231
 TECHNICIAN NAME Michael Kindley SIGNATURE Michael Kindley
 TECHNICIAN NAME Rolf Erga SIGNATURE Rolf Erga
 TIME ARRIVED 1057 TIME DEPARTED 1200 DATE 07 Mar 90
 dd mm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

Unit 566 is a three bedroom, Capehart-style unit with wood shingles on outside walls and tar shingles on roof. Inside floors are covered by vinyl flooring, walls and ceilings are plaster board. Pipes below attic are bare of insulation. There is an expansion joint on furnace duct similar to the one in Unit 570. Not sampled in Unit 566.

There were two pipe runs in the attic covered by a gray, arcell-type material. Cloth wrap on top. No joints could be seen.

Pipes are obscured from view by blown-in attic insulation. This blown-in material not suspicious.

Five floor tiles, four duct, and two pipe runs sampled in this unit. Also one sample was taken of a duct insulation in the attic. Observes where furnace duct leaves Htr Rm and enters attic.

ACTIVITY CHECKLIST

Interviews Completed	<u>No</u>	Number of Samples	<u>12</u>
Drawings Reviewed	<u>No</u>	Survey Form Completed	<u>Yes</u>
Drawings Attached	<u>Yes</u>	Site Log Completed	<u>Yes</u>
Visual Inspection	<u>Yes</u>	Chain-of-Custody Initiated	<u>Yes</u>
Number of Photos	<u>3</u>	Exp. Assess. Form Init.	<u>Yes</u>
Q.A. Check ☒	SIGNATURE <u>Michael Skotnicki</u>	DATE <u>21 MAR 90</u>	dd mm yy

ASBESTOS SURVEY DATA

055

BLDG. NO.: S 16 16

INSTALLATION 01217

TASK TEAM MEMBERS

Michael Kindley

Rolf Erya

W.O. No. 2104-13-01

CLIENT: ARGONNE NATIONAL

BLDG. NAME: Hermania Family Housing, Unit 506

DATE (dd/mm/yy): 07/03/90

BLDG. DESCRIPTION: Cupchart

TIME ARRIVED: 10 57

ITEM NO.	LAB SAMPLE NO.	BASE NO.	STATE	UNIT NO.	SAMPLE CODE	AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
1.	B10141710	-217	-P1A	-S1610	-A1F1T	KITCHEN	1244	-	1117110	01
2.	B10141717	-217	-P1A	-S1610	-A1F1T	HALL	11610	-	1117110	01
3.	B10141712	-217	-P1A	-S1610	-A1F1T	LIVING ROOM	151616	-	1117110	01
4.	B10141714	-217	-P1A	-S1610	-A1F1T	LIVING ROOM	11312	-	1117110	01
5.	B10141810	-217	-P1A	-S1610	-A1F1T	HALL	1119	-	1117110	01
6.	B10141811	-217	-P1A	-S1610	-A1T10	LIVING ROOM	111	-	1117110	01
7.	B10141812	-217	-P1A	-S1610	-A1T10	BATH	111	-	1117110	01
8.	B10141813	-217	-P1A	-S1610	-A1T10	BEDROOM	111	-	1117110	01
9.	B10141814	-217	-P1A	-S1610	-A1T10	BATH	111	-	1117110	01
10.	B10141815	-217	-P1A	-S1610	-A1T10	BATH	111	-	1117110	01
11.	B10141816	-217	-P1A	-S1610	-A1T10	BATH	111	-	1117110	01
12.	1111	-1	-1	-11	-A11	HALL	111	-	1117110	01
13.	B10141817	-217	-P1A	-S1610	-A1T10	ATTIC	8	-	1117110	01

NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Brown 12' x 12" floor tile. Also in Bath 1 and Bedroom 1
02	Gray-green 9' x 9" floor tile. Also in Living Room, Bath 2, and Bedroom 3.
03	Gray 9' x 9" floor tile. Also in Hall, Bedroom 3, and Bedroom 2
04	Black 9' x 9" floor tile. Also in Hall, Bedroom 1, Bedroom 2, and Bedroom 3. In closets.
05	Off-white 9' x 9" floor tile.
06	Dust in ducts. Vent is covered in Kitchen.
07	Pipe runs covered by gray, sawdust-type material. Cloth wrap on top. Pipes are 24" in diameter. Probably hot water lines.
08	Expansion joint. Like that one in Unit 570. Not sampled here. Quantity - each

TECHNICIAN
SIGNATURE

Michael Kindley

QUALITY ASSURANCE
SIGNATURE

Michael Skotnicki

ASBESTOS SURVEY DATA (CONTINUED)

[illegible]

WESTON

Herminie, PA

0861

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01
 FACILITY/BLDG. NO. Hermine Family Housing, Unit 560
 FACILITY CONTACT Sandy Ricketts TELEPHONE NUMBER (712) 777-1231
 TECHNICIAN NAME Michael Kindley SIGNATURE Michael Kindley
 TECHNICIAN NAME Rolf Erga SIGNATURE Rolf Erga
 TIME ARRIVED 1204 TIME DEPARTED 1248 DATE 07 Mar 90
 dd mm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

Unit 560 is a three bedroom Capehart-style unit, with
 wooden shingles on outside walls, and tar shingles on roof.

Inside floors are covered by vinyl flooring, walls and ceiling
 are plaster board. All pipes below the attic are bare w/
 insulation. There is an expansion joint in Htr Rm similar to
 that one in Unit 570. Not sampled here.

There are two pipe runs in the attic covered by a gray, rabbit-
 type insulation, with a cloth wrap on the outside. The pipes are
 obscured from view by blown-in insulation. The hard dust
 insulation noted in Unit 566 was noted in this unit. Not
 sampled in this unit. It is very difficult to reach this dust
 because the attic is very constricted.

Four dust samples, two pipe runs, and five floor tile samples
 taken in Unit 560.

ACTIVITY CHECKLIST

Interviews Completed <u>N</u>	Number of Samples <u>11</u>
Drawings Reviewed <u>N</u>	Survey Form Completed <u>Yes</u>
Drawings Attached <u>Yes</u>	Site Log Completed <u>Yes</u>
Visual Inspection <u>Yes</u>	Chain-of-Custody Initiated <u>Yes</u>
Number of Photos <u>2</u>	Exp. Assess. Form Init. <u>Yes</u>
Q.A. Check ☒	SIGNATURE <u>Michael Skofnicki</u> DATE <u>21 MAR/90</u>

ASBESTOS SURVEY DATA

0563

BLDG. NO.: 51610

INSTALLATION 01217

TASK TEAM MEMBERS

Michael Kindley

Rolf Erga

W.O. No. 2104-13-01

CLIENT: ARGONNE NATIONAL LAB

BLDG. NAME: Hermanic Family Housing Unit S60

DATE (dd/mm/yy): 07/03/90

BLDG. DESCRIPTION: Capehart

TIME ARRIVED: 1204

ITEM NO.	LAB SAMPLE NO.	BASE NO.	STATE	UNIT NO.	SAMPLE CODE	AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
1.	B104126	-27	-PIA	-S1610	-A1P1T	HALLWAY	115	-	11724F	011
2.	B104127	-27	-PIA	-S1610	-A1P1T	HALLWAY	11910	-	11731A	012
3.	B1041910	-27	-PIA	-S1610	-A1P1T	BEDROOM	11318	-	11731B	013
4.	B1041911	-27	-PIA	-S1610	-A1P1T	BEDROOM	11817	-	11731C	014
5.	B1041912	-27	-PIA	-S1610	-A1P1T	BATH	1118	-	11731D	015
6.	B1041913	-27	-PIA	-S1610	-A1T1D	LIVING ROOM	111	-	111	016
7.	B1041914	-27	-PIA	-S1610	-A1T1D	HALLWAY	111	-	111	016
8.	B1041915	-27	-PIA	-S1610	-A1T1D	BATH	111	-	111	016
9.	B1041916	-27	-PIA	-S1610	-A1T1D	BEDROOM	111	-	111	016
10.	B1041917	-27	-PIA	-S1610	-A1P1T	ATTIC	1110	Y	11731E	017
11.	B1041918	-27	-PIA	-S1610	-A1P1T	ATTIC	1110	Y	11731F	017
12.	1111	-1	-1	-11	-A11	HALLWAY	1111	-	11744A	018
13.						ATTIC	8	-	11745	019

NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Brown 12" x 12" floor tile.
02	Gray-green 12" x 12" floor tile. Also in Living Room, and Kitchen.
03	Black 9" x 9" floor tile. Also in Living Room, Hall, Bedroom 2, and Bedroom 3. Obscured in closets.
04	Gray 9" x 9" floor tile. Also in Living Room Hall, Bath 1, Bath 2, Bedroom 2, and Bedroom 3.
05	White 9" x 9" floor tile.
06	Dust in ducts.
07	Pipe runs covered by urethane-type insulation. Two lines. Each 4" in diameter. No joint material noted. Pipes obscured from view by blown-in insulation.
08	Expansion joint. Like one in Unit S70. Not sampled. Quantity: each

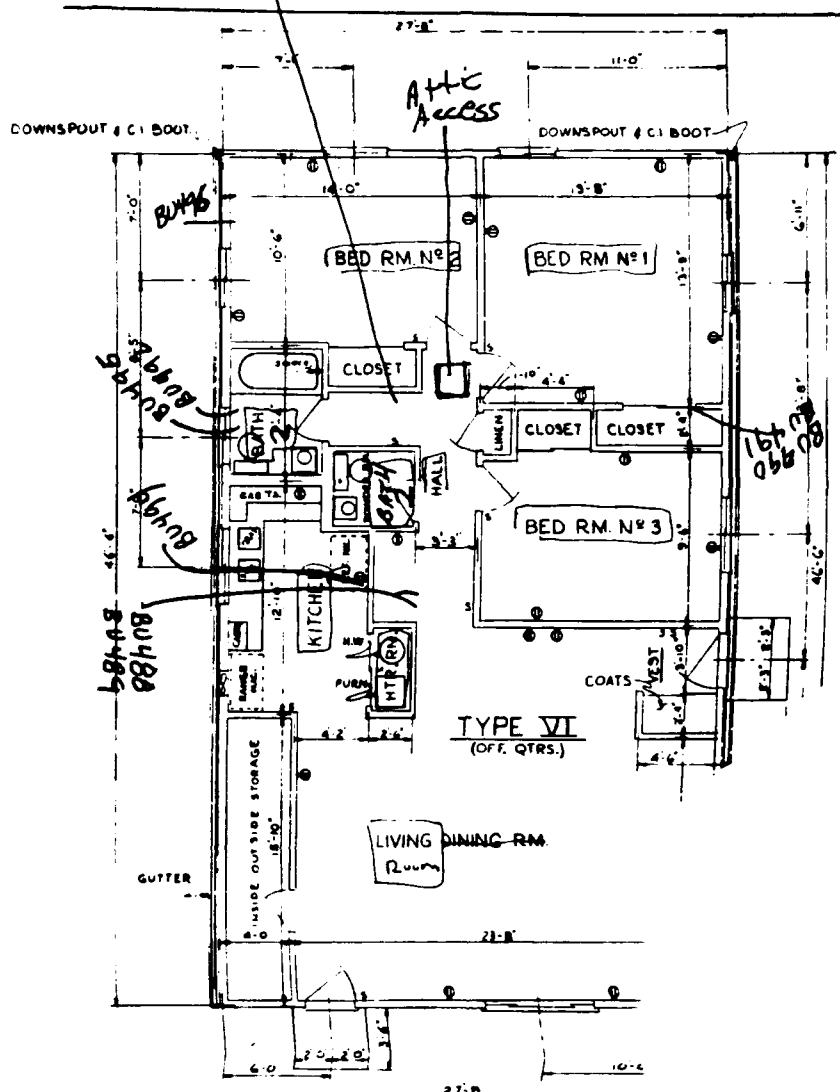
TECHNICIAN
SIGNATURE

Michael Kindley

QUALITY ASSURANCE
SIGNATURE

Michael Skutnicki

BU 447
BU 448)



UNIT S-60

Herminie, PA

APPENDIX A.2. LABORATORY DATA, ASBESTOS SAMPLES

BULK SAMPLE ANALYSIS SUMMARY

Weston W.O. No. 2104-13-01-0000

Sample Number BU462 through Sample BU498

AO LAB ID NO	CLIENT/CLIENT ID	LOCATION	MATERIAL DESCRIPTION*	DATE RECEIVED	RESULTS**					LAYERS	ANALYST
					CH	AM	CR	OT	TL		
BU462	27-PA-S70-AFT	KIT	NF, RD, 9X9 FT	03/09/90	1	ND	ND	ND	1	No	6806
BU463	27-PA-S70-AFT	LIV RM	NF, GY, 9X9 FT	03/09/90	3	ND	ND	ND	3	No	6806
BU464	27-PA-S70-AFT	LIV RM	NF, GY, 9X9 FT	03/09/90	1	ND	ND	ND	1	No	6806
BU465	27-PA-S70-AFT	LIV RM	NF, BK, 9X9 FT	03/09/90	2	ND	ND	ND	2	No	6806
BU466	27-PA-S70-AFT	HALL	NF, RD, 9X9 FT	03/09/90	1	ND	ND	ND	1	No	6806
BU467	27-PA-S70-AFT	BATH1	NF, WH, 9X9 FT	03/09/90	2	ND	ND	ND	2	No	6806
BU468	27-PA-S70-AFT	BATH1	NF, WH, 9X9 FT	03/09/90	1	ND	ND	ND	1	No	6806
BU469	27-PA-S70-AFT	HTR RM	F, EXPAN JT	03/09/90	ND	ND	ND	ND	ND	No	6806
BU474	27-PA-S70-API	ATTIC	F, PIPE RUN	03/09/90	5	ND	ND	ND	5	Yes	6806
BU475	27-PA-S70-API	ATTIC	F, PIPE RUN	03/09/90	10	ND	ND	ND	10	Yes	6806
BU476	27-PA-S66-AFT	KIT	NF, BR, 12X12 FT	03/09/90	1	ND	ND	ND	1	Yes	7323
BU477	27-PA-S66-AFT	HALL	NF, GY, 9X9 FT	03/09/90	<1	ND	ND	ND	<1	Yes	7323
BU478	27-PA-S66-AFT	LIV RM	NF, GY, 9X9 FT	03/09/90	8	ND	ND	ND	8	Yes	7323
BU479	27-PA-S66-AFT	LIV RM	NF, BK, 9X9 FT	03/09/90	10	ND	ND	ND	10	Yes	7323
BU480	27-PA-S66-AFT	HALL	NF, WH, 9X9 FT	03/09/90	1	ND	ND	ND	1	Yes	7323
BU485	27-PA-S66-API	ATTIC	F, PIPE INSUL	03/09/90	1	ND	ND	ND	1	Yes	7323
BU486	27-PA-S66-API	ATTIC	F, PIPE INSUL	03/09/90	8	ND	ND	ND	8	Yes	7323
BU487	27-PA-S66-API	ATTIC	NF, GY, CEMENTITIO	03/09/90	20	ND	ND	ND	20	No	7323
BU488	27-PA-S60-AFT	HALL	NF, BR, 12X12 FT	03/09/90	ND	ND	ND	ND	ND	Yes	7323
BU489	27-PA-S60-AFT	HALL	NF, GY, 12X12 FT	03/09/90	1	ND	ND	ND	1	Yes	7323
BU490	27-PA-S60-AFT	BEDRM1	NF, BK, 9X9 FT	03/09/90	15	ND	ND	ND	15	Yes	7323
BU491	27-PA-S60-AFT	BEDRM1	NF, GY, 9X9 FT	03/09/90	12	ND	ND	ND	12	Yes	7323
BU492	27-PA-S60-AFT	BATH2	NF, WH, 9X9 FT	03/09/90	1	ND	ND	ND	1	Yes	7323
BU497	27-PA-S60-API	ATTIC	F, PIPE INSUL	03/09/90	4	ND	ND	ND	4	Yes	7323
BU498	27-PA-S60-API	ATTIC	F, PIPE INSUL	03/09/90	4	ND	ND	ND	4	Yes	7323

MATERIAL DESCRIPTION	FRIABLE ¹	COLOR ²		SYSTEM ³
Friable ¹ , Color ² , System ³ , Type	F - Friable NF - Non-Friable	BK - Black BL - Blue BR - Brown GR - Green GY - Gray	RD - Red TN - Tan WH - White YL - Yellow	CHW - Chilled Water DOM - Domestic Water HHW - Heating Hot Water STM - Steam UNK - Unknown
** RESULTS				
CH - Chrysotile AM - Amosite CR - Crocidolite	OT - Other TL - Total			

Upon issue, this report may be reproduced only in full.

All analyses are performed in accordance with the methods set forth in U.S. EPA 600/M4-82-020, as amended. Weston's Optical Microscopy Laboratory is accredited by the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program for asbestos fiber analysis (Laboratory Code 1254).



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AUBURN, AL 36830
PHONE: (205) 826-6100
FAX: (205) 826-8232

Transmission Electron Microscopy Asbestos Summary Report

Client: Argonne National Laboratories Weston W.O. No.: 2104-13-01-0000

Sample Type(s): Dust and Floor Tiles Sampling Location: Herminie

QUALITATIVE ANALYSIS

FLOOR TILES: A 0.5 to 2.0 gram portion of each floor tile sample was ultrasonically disaggregated in four milliliters of deionized, 0.2 μ m membrane filtered water. After the coarse fraction settled, a drop of the suspended, clay-sized fraction was placed on a Formvar coated 200 mesh Cu TEM grid and allowed to dry. The grid was carbon coated for thermal stability in the electron beam and examined with a Philips CM12 transmission electron microscope operating at 120 kilovolts accelerating voltage.

DUST WIPE SAMPLES: A generous loading of dust was collected on a pre-wetted, 25 square centimeter section of a cleanroom wipe. The wipe was placed in a two ounce wide mouth collection vial and returned to the laboratory. Ten to fifteen milliliters of filtered, deionized water was added to suspend the dust. The suspension was ultrasonically dispersed and the coarse fraction was allowed to settle. A drop of the suspension was placed on a Formvar coated 200 mesh Cu TEM grid and allowed to dry. The grid was carbon coated as above and examined by transmission electron microscopy at 120 kilovolts accelerating voltage.

ANALYTICAL RESULTS

<u>SAMPLE IDENTIFICATION</u>	<u>RESULTS</u>
BU470-27-PA-S70-ATD	Positive
BU471-27-PA-S70-ATD	Positive
BU472-27-PA-S70-ATD	Positive
BU473-27-PA-S70-ATD	Negative
BU481-27-PA-S66-ATD	Negative
BU482-27-PA-S66-ATD	Positive



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ANALYTICAL RESULTS
(continued)

SAMPLE IDENTIFICATION

BU483-27-PA-S66-ATD
BU484-27-PA-S66-ATD
BU488-27-PA-S60-AFT
BU493-27-PA-S60-ATD
BU494-27-PA-S60-ATD
BU495-27-PA-S60-ATD
BU496-27-PA-S60-ATD

RESULTS

Positive
Positive
Positive
Positive
Positive
Positive
Positive

Barry Rayhill
(Approved for transmittal)

4/2/90
(Date)

- * This test report relates only to the specific items tested.
- ** These sample results may only be reproduced in full, and are valid only if approved for transmittal.

APPENDIX B.1. FIELD DATA, AIRBORNE ASBESTOS SAMPLING

FIELD NOTES FOR HERMINIE
UNIT 70
18 APRIL 1990

The Herminie facility is a two-bedroom slab-on-grade unit. It is similar to others observed. It has plywood exterior sheathing in horizontal strips. The unit is covered with floor tile over the slab throughout. The living room, hallway and all three bedrooms are done in a gray tile with black and white streaks. Closet floors throughout the facility, with the exception of the laundry room, are covered by a black 9"x9" floor tile with white streaks. There is a different gray tile in a very small area of the full bath, but it is a notably different floor tile. Evidence of patching is clear in several other places as well. The laundry room and kitchen are both covered with a red 9"x9" floor tile. This tile has the white streaks in it. The mechanical room in this unit is located in the kitchen and the heater system has a canvas appearing black coated fabric expansion joint. It has a much finer weave than the ones that are common. However it was also seen at another site, Dorseyville, in this area. The ductwork in the floors of this unit appears to be transite having an inside diameter of approximately four inches. Samples were collected in the kitchen, living room, bathroom, and bedroom as noted on the sampling data sheets. These were the same sample points that had been tested earlier for dust, therefore no dust samples were collected. The storage room in the living area off the kitchen has no tile on the floor. The sampling was performed on Wednesday morning, 18 March 1990. It was a clear day, very cool, below 30 degrees at the start. There was little if any wind blowing during the sampling period.

AIR MONITORING DATA

CLIENT Argonne Nat'l Lab. WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Herminie Unit 70
 WORK AREA ID NO. _____ SAMPLE NO. S-70-LR

SAMPLE TYPE

☐ PERSONNEL

NAME _____

TASK _____

☒ AMBIENT

☐ WORK AREA

☐ ADJACENT ROOM

☐ BACKGROUND

☒ OTHER Living Room Vent

☐ CLEAN ROOM

☐ AFD EXHAUST

☐ CLEARANCE

☐ INITIAL

☐ FINAL, REOCCUPANCY

☐ OTHER _____

☐ TWA SAMPLE
(SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. 88

PUMP Cal Initial 6 9.9 10.0 L/min
no. rate Mean Flow

PUMP Cal Final 7 10.0 1840 L
no. rate Sample Vol. (VA)

0854
Time Began

1159
Time End

185 min
Sample Time

L. Nelms
Technician

18 Apr. '90
Date

ANALYTICAL DATA

ANALYST _____

Scope ID. _____

Date/Time Mounted _____

Total Fibers Counted _____

Average Count 1/fld

Blank Corrected Count (BCC) _____

Detection Limit (DL) 1/cc

Microscopic Field Area (MFA) mm² _____

Date/Time Counted _____

Total Fields Counted _____

Blank Count 1/fld

Fiber Density 1/mm²

Concentration (C) 1/cc

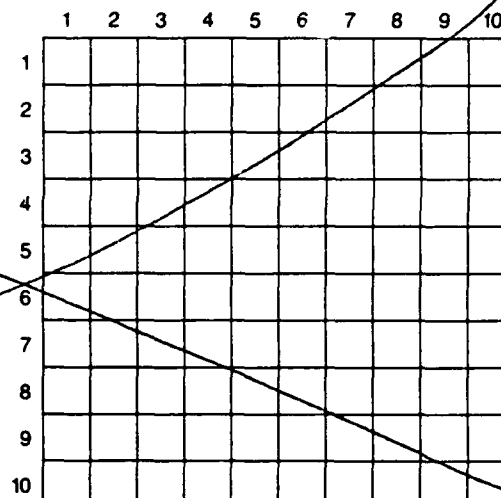
$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

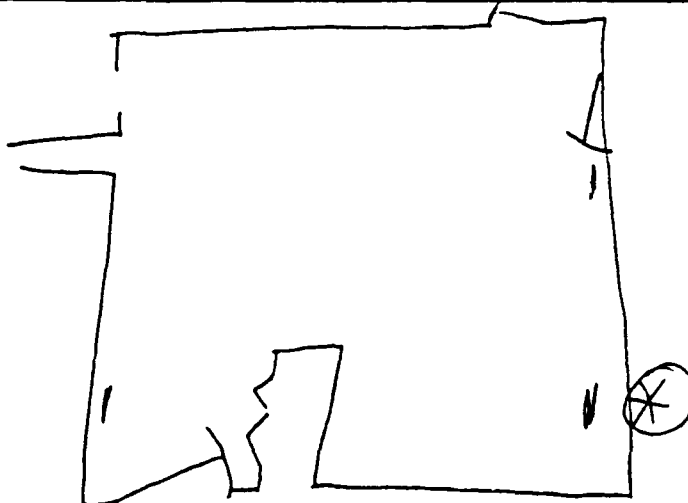
Signature _____

Date _____



NOTES/SKETCHES REMARKS

TEM



AIR MONITORING DATA

CLIENT Argonne Nat'l Lab WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Plutonium Unit 70
 WORK AREA ID NO. _____ SAMPLE NO. S70-KI

SAMPLE TYPE

☐ PERSONNEL

NAME _____

TASK _____

☒ AMBIENT

☐ WORK AREA

☐ ADJACENT ROOM

☐ BACKGROUND

☒ OTHER Kitchen Vent

☐ CLEAN ROOM

☐ AFD EXHAUST

☐ CLEARANCE

☐ INITIAL

☐ FINAL REOCCUPANCY

☐ OTHER _____

☐ TWA SAMPLE
(SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. 37

PUMP Cal Initial 6 9.9 9.8 L/min

PUMP Cal Final 7 9.8 1820 L/min
no. rate Sample Vol. (VA)

0853 1158 185 min
Time Began Time End Sample Time

L. Nelms 18 Apr '90
Technician Date

ANALYTICAL DATA

ANALYST _____

Scope ID _____ Microscopic Field Area (MFA) mm²

Date/Time Mounted _____ Date/Time Counted _____

Total Fibers Counted _____ Total Fields Counted _____

Average Count 1/field Blank Count 1/field

Blank Corrected Count (BCC) 1/field Fiber Density 1/field

Detection Limit (DL) 1/cc Concentration (C) 1/cc

$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

Signature _____

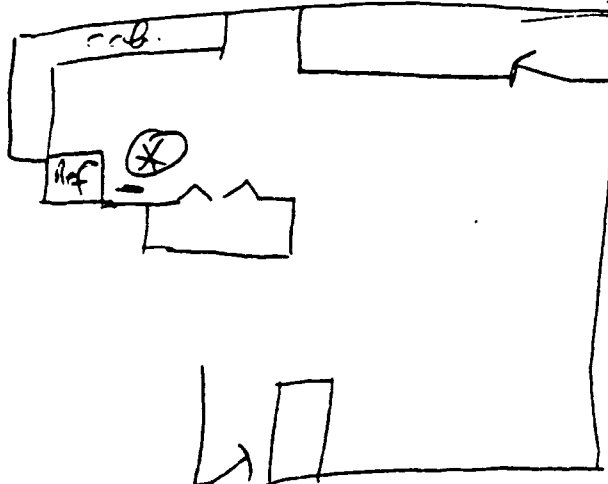
Date _____

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1										
2										
3										
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5										
6										
7										
8										
9										
10										

NOTES/SKETCHES REMARKS

TE M

Sealing Band Broken during Sampling



AIR MONITORING DATA

CLIENT Argonne Nat'l Lab WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Hennipie Unit 70
 WORK AREA ID NO. _____ SAMPLE NO. S-70-BR

SAMPLE TYPE

☐ PERSONNEL

NAME _____

TASK _____

☒ AMBIENT

☐ WORK AREA

☐ ADJACENT ROOM

☐ BACKGROUND

☒ OTHER Bedroom Vent

☐ CLEAN ROOM

☐ AFD EXHAUST

☐ CLEARANCE

☐ INITIAL

☐ FINAL REOCCUPANCY

☐ OTHER _____

☐ TWA SAMPLE
(SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. 87

PUMP Cal Initial 6 9.8 9.8 L/min

PUMP Cal Final 7 9.8 1820 L/min
no. rate Sample Vol. (VA)

0855
Time Began

1201
Time End

186
Sample Time min

L. Nelms
Technician

18 Apr '90
Date

ANALYTICAL DATA

ANALYST _____

Scope ID. _____

Date/Time Mounted _____

Total Fibers Counted _____

Average Count 1/fld

Blank Corrected Count (BCC) _____

Detection Limit (DL) 1/cc

Microscopic Field Area (MFA) mm²

Date/Time Counted _____

Total Fields Counted _____

Blank Count 1/fld

Fiber Density 1/mm²

Concentration (C) 1/cc

$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

Signature _____

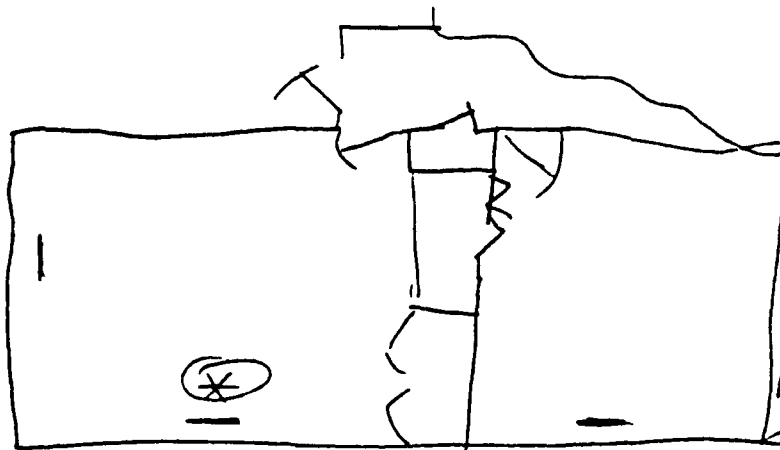
Date _____

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

NOTES/SKETCHES REMARKS

TEM

Sealing Band Broke during Sampling



Front Entry

AIR MONITORING DATA

CLIENT Argonne Nat'l Lab WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Hermine Unit 70
 WORK AREA ID NO. _____ SAMPLE NO. S-70-BA

SAMPLE TYPE

- ☐ PERSONNEL ☒ AMBIENT ☐ WORK AREA ☐ CLEAN ROOM ☐ CLEARANCE
☐ ADJACENT ROOM ☐ AFD EXHAUST ☐ INITIAL
☐ BACKGROUND ☒ OTHER Bathroom Vent ☐ FINAL REOCCUPANCY
☐ TWA SAMPLE (SEE ADDITIONAL SHEETS)
- NAME _____
 TASK _____

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385
 PUMP ID. 93 0856 1157 181 min
 Time Began Time End Sample Time
L. NELMS 18 Apr '90
 Technician Date
 PUMP Cal Initial 6 10.2 10.0 L/min
 (rate) (rate) (rate)
 PUMP Cal Final 7 9.9 1820
 no. rate Sample Vol. (VA)

ANALYTICAL DATA

ANALYST _____
 Scope ID _____ Microscopic Field Area (MFA) mm² _____
 Date/Time Mounted _____ Date/Time Counted _____
 Total Fibers Counted _____ Total Fields Counted _____
 Average Count 1/field _____ Blank Count 1/field _____
 Blank Corrected Count (BCC) _____ Fiber Density 1/mm² _____
 Detection Limit (DL) 1/cc _____ Concentration (C) 1/cc _____

$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$ DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

Signature _____ Date _____

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

NOTES/SKETCHES REMARKS

Sealing Band broke during sampling
TEM



AIR MONITORING DATA

CLIENT Argonne Nat'l Lab. WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Hermine Unit 70
 WORK AREA ID NO. _____ SAMPLE NO. S-70-04T

SAMPLE TYPE

☐ PERSONNEL

NAME _____

TASK _____

☒ AMBIENT

☐ WORK AREA

☐ ADJACENT ROOM

☒ BACKGROUND

☐ OTHER _____

☐ CLEAN ROOM

☐ AFD EXHAUST

☐ CLEARANCE

☐ INITIAL

☐ FINAL, REOCCUPANCY

☐ OTHER _____

☐ TWA SAMPLE

(SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. 92

PUMP Cal Initial 6 9.3 9.4 L/min

PUMP Cal Final 7 9.5 18.40 L/min

0852

Time Began

1208

Time End

196

Sample Time

L. Nelms

Technician

18 Apr '90

Date

ANALYTICAL DATA

ANALYST _____

Scope ID _____

Date/Time Mounted _____

Total Fibers Counted _____

Average Count 1/fld

Blank Corrected Count (BCC) _____

Detection Limit (DL) 1/cc

Microscopic Field Area (MFA) mm²

Date/Time Counted _____

Total Fields Counted _____

Blank Count 1/fld

Fiber Density 1/mm²

Concentration (C) 1/cc

$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

NOTES/SKETCHES REMARKS

TEM

⊗ outside window.



	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

AIR MONITORING DATA

CLIENT Argonne Nat'l LAB WORKER ORDER NUMBER 2104-13-02
 PROJECT LOCATION Hermine Unit 70
 WORK AREA ID NO. _____ SAMPLE NO. S-70-FB

SAMPLE TYPE

☐ PERSONNEL

NAME _____

TASK _____

☒ AMBIENT

☐ WORK AREA

☐ ADJACENT ROOM

☐ BACKGROUND

☒ OTHER Field Blank

☐ CLEAN ROOM

☐ AFD EXHAUST

☐ CLEARANCE

☐ INITIAL

☐ FINAL REOCCUPANCY

☐ OTHER

☐ TWA SAMPLE
(SEE ADDITIONAL SHEETS)

SAMPLE DATA

Filter area (FA), mm² ☐ 855 ☒ 385

PUMP ID. NONE

PUMP Cal Initial NA — — L/min

PUMP Cal Final NA — — Sample Vol. (VA)

0851 1203 192 min

L. NELMS 18 Apr '90
Technician Date

ANALYTICAL DATA

ANALYST _____

Scale ID. _____ Microscopic Field Area (MFA) mm²

Date/Time Mounted _____ Date/Time Counted _____

Total Fibers Counted _____ Total Fields Counted _____

Average Count 1/1d Blank Count 1/1d

Blank Corrected Count (BCC) _____ Fiber Density 1/mg²

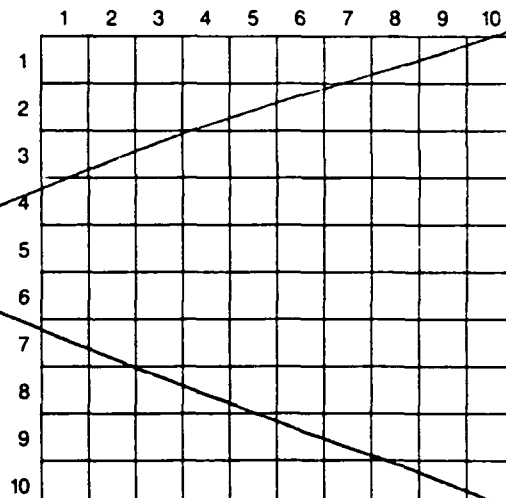
Detection Limit (DL) 1/cc Concentration (C) 1/cc

$$C = \frac{(BCC)(FA)}{(VA)(MFA)(1000)}$$

DL = 10 fibers/100 fields

The above-reported results were obtained when the sample was counted in accordance with NIOSH 7400.

Signature _____ Date _____



NOTES/SKETCHES REMARKS

TEM

APPENDIX B.2. LABORATORY DATA, AIRBORNE ASBESTOS SAMPLING



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1635 PUMPHREY AVE.
AUBURN, AL 36830
PHONE: (205) 826-6100
FAX: (205) 826-8232

TRANSMISSION ELECTRON MICROSCOPY
ASBESTOS ANALYSIS REPORT

Client: ARGONNE
Client Sample ID: S-70-LR

Weston W.O. No.: 2104-13-02-0000
Weston Sample ID No.: EE936

Received by: Barry Rayfield
Analyzed by: Greg Hall

Date Received: 04/19/90
Date Analyzed: 04/24/90

Filter Type: 0.45 μ m, 25 mm, MEC
Number of Grids Examined: 2
Average Grid Square Area: 0.0088 mm²
Sample Volume: 1840.0 liters
EPA Analysis: AHERA

Filter Area: 385 mm²
Number of Grid Squares Examined: 6
Total Area Examined: 0.0528 mm²
Detection Limit: 0.004 fibers/cc
Grid Archive No.: 0225-D-10,E-6

ANALYTICAL RESULTS

	<u>Chrysotile</u>		<u>Amphiboles</u>		<u>Ambiguous</u>	<u>Non-Asbestos</u>
	<u><5μm</u>	<u>$\geq$5μm</u>	<u><5μm</u>	<u>$\geq$5μm</u>		
Number of Fibers Analyzed:	0	0	0	0	0	0
Number of Bundles Analyzed:	0	0	0	0	0	0
Number of Clusters Analyzed:	0	0	0	0	0	0
Number of Matrices Analyzed:	0	0	0	0	0	0

SUMMARY

Concentration of Asbestos Structures < 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures < 5 μ m in length: ND (structures/mm²)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/mm²)
Total Concentration of Asbestos Structures ND (structures/cc)
Total Concentration of Asbestos Structures ND (structures/mm²)
Comments: A matrix with a non-emergent chrysotile fiber was identified.


(Approved for Transmittal)

April 25, 1990
(Date)

This test report relates only to the specific items tested.



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TRANSMISSION ELECTRON MICROSCOPY
ASBESTOS ANALYSIS REPORT

Client: ARGONNE
Client Sample ID: S-70-KI

Weston W.O. No.: 2104-13-02-0000
Weston Sample ID No.: EE937

Received by: Barry Rayfield
Analyzed by: Greg Hall

Date Received: 04/19/90
Date Analyzed: 04/24/90

Filter Type: 0.45 μ m, 25 mm, MEC
Number of Grids Examined: 2
Average Grid Square Area: 0.0088 mm²
Sample Volume: 1820.0 liters
EPA Analysis: AHERA

Filter Area: 385 mm²
Number of Grid Squares Examined: 6
Total Area Examined: 0.0528 mm²
Detection Limit: 0.004 fibers/cc
Grid Archive No.: 0225-E-8,9

ANALYTICAL RESULTS

	<u>Chrysotile</u>		<u>Amphiboles</u>		Ambiguous	Non-Asbestos
	<5 μ m	$\geq$ 5 μ m	<5 μ m	$\geq$ 5 μ m		
Number of Fibers Analyzed:	0	0	0	0	0	0
Number of Bundles Analyzed:	0	0	0	0	0	0
Number of Clusters Analyzed:	0	0	0	0	0	0
Number of Matrices Analyzed:	0	0	0	0	0	0

SUMMARY

Concentration of Asbestos Structures < 5 μ m in length: ND (structures/cc)

Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/cc)

Concentration of Asbestos Structures < 5 μ m in length: ND (structures/mm²)

Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/mm²)

Total Concentration of Asbestos Structures ND (structures/cc)

Total Concentration of Asbestos Structures ND (structures/mm²)

Comments:


(Approved for Transmittal)

April 25, 1990
(Date)

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TRANSMISSION ELECTRON MICROSCOPY
ASBESTOS ANALYSIS REPORT

Client: ARGONNE
Client Sample ID: S-70-BR

Weston W.O. No.: 2104-13-02-0000
Weston Sample ID No.: EE938

Received by: Barry Rayfield
Analyzed by: Barry Rayfield

Date Received: 04/19/90
Date Analyzed: 04/24/90

Filter Type: 0.45 μ m, 25 mm, MEC
Number of Grids Examined: 2
Average Grid Square Area: 0.0088 mm²
Sample Volume: 1820.0 liters
EPA Analysis: AHERA

Filter Area: 385 mm²
Number of Grid Squares Examined: 6
Total Area Examined: 0.0528 mm²
Detection Limit: 0.004 fibers/cc
Grid Archive No.: 0226-A-2,3

ANALYTICAL RESULTS

	<u>Chrysotile</u>		<u>Amphiboles</u>		<u>Ambiguous</u>	<u>Non-Asbestos</u>
	<u><5μm</u>	<u>$\geq$5μm</u>	<u><5μm</u>	<u>$\geq$5μm</u>		
Number of Fibers Analyzed:	0	0	0	0	0	2
Number of Bundles Analyzed:	0	0	0	0	0	0
Number of Clusters Analyzed:	0	0	0	0	0	0
Number of Matrices Analyzed:	0	0	0	0	0	0

SUMMARY

Concentration of Asbestos Structures < 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures < 5 μ m in length: ND (structures/mm²)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/mm²)
Total Concentration of Asbestos Structures ND (structures/cc)
Total Concentration of Asbestos Structures ND (structures/mm²)

Comments:


(Approved for Transmittal)

April 25, 1990
(Date)

This test report relates only to the specific items tested.



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TRANSMISSION ELECTRON MICROSCOPY
ASBESTOS ANALYSIS REPORT

Client: ARGONNE
Client Sample ID: S-70-BA

Weston W.O. No.: 2104-13-02-0000
Weston Sample ID No.: EE939

Received by: Barry Rayfield
Analyzed by: Beth Hiltbold

Date Received: 04/19/90
Date Analyzed: 04/24/90

Filter Type: 0.45 μ m, 25 mm, MEC
Number of Grids Examined: 2
Average Grid Square Area: 0.0088 mm²
Sample Volume: 1820.0 liters
EPA Analysis: AHERA

Filter Area: 385 mm²
Number of Grid Squares Examined: 6
Total Area Examined: 0.0528 mm²
Detection Limit: 0.004 fibers/cc
Grid Archive No.: 0226-A-4,5

ANALYTICAL RESULTS

	<u>Chrysotile</u>		<u>Amphiboles</u>		<u>Ambiguous</u>	<u>Non-Asbestos</u>
	<u><5μm</u>	<u>$\geq$5μm</u>	<u><5μm</u>	<u>$\geq$5μm</u>		
Number of Fibers Analyzed:	0	0	0	0	0	7
Number of Bundles Analyzed:	0	0	0	0	0	0
Number of Clusters Analyzed:	0	0	0	0	0	0
Number of Matrices Analyzed:	0	0	0	0	0	0

SUMMARY

Concentration of Asbestos Structures < 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/cc)
Concentration of Asbestos Structures < 5 μ m in length: ND (structures/mm²)
Concentration of Asbestos Structures $\geq$ 5 μ m in length: ND (structures/mm²)
Total Concentration of Asbestos Structures ND (structures/cc)
Total Concentration of Asbestos Structures ND (structures/mm²)

Comments:


(Approved for Transmittal)

April 25, 1990
(Date)

This test report relates only to the specific items tested.

Argonne Comments on
Draft Sampling and Analysis Report
for
Family Housing Unit at Herminie, PA., Irwin, PA.
and Sun Prairie, WI.

GENERAL COMMENTS

The reports on the three sites which I reviewed today are alike in many respects. The specific comments I made in my earlier reviews are applicable to each of these three sites at the appropriate places. Therefore, the specific comments are not repeated here. However, I have made attempts here to bring to your attention a few general comments which are applicable to all the reports I have reviewed so far. It is my belief that paying attention to these general comments is likely to improve the quality of the reports and possibly shorten them because of removing the repetitions.

The summary in Sec.3 is no longer needed because of the summary in the front of the report. I find that even without Sec.3 the body of the report will be complete.

The executive summary should be site specific. There is no need for any general material here. See comments on the Rural Ridge report for elaboration.

Material evaluation data sheets do not carry information on house number. Furthermore, in this report and in other reports also, I find that these sheets are included in some random way, sometimes 2 sheets to a unit and at other times more than two sheets, some of which are xerox copies of one of the two sheets. The page numbers on the top of the pages reveal that enough attention has not been paid to the inclusion of the correct sheets identifiable with the unit in which sampling was done. If these sheets are an important part of the document then some effort must be made to identify the sheets to the houses from which samples were obtained. If the sheets are used only as an aid for the field sampling team to do their work in a systematic manner, then the sheets need not be included in the report. In my opinion, I find that the sheets do not seem to add anything significant to the quality of the report. Simple and straight forward statements as to what was found and what was sampled are adequate. Also, one must remember that the sampling and analyses work is a representation for the site, and therefore is not a comprehensive study. Adequate mention is made in the text to show that the sampling work was done in 10% of the units or in 3 units, whichever is greater, and not in all units at the site. The results of analyses on this limited sampling effort are the basis for the recommendations for the whole site and not just to units sampled only. This being the case are we getting any additional information from the material evaluation sheets filled out by the field team? Of course, the material evaluation sheets must be kept as a part of the record of the work on this project, even though these may not be included in the reports.

In this report and in all other reports reviewed in the last few weeks, I would like to say that Sec.2 of the report contains all the necessary information, but with repetitions and also lacking in orderly progression of the work done. I want to suggest here that Weston report writers may pay some attention to remove the repetitions and rewrite portions of Sec.2. I will advance here my specific preference in bringing order to this section.

Section 2. Asbestos

2.1 Sampling rationale: In this section, say what was required by ANL and what was done. Say also, why the deviations from the requirements were necessary. Bring out

Argonne Comments on
Draft Sampling and Analysis Report
for
Family Housing Unit at **Herminie, PA.**

GENERAL COMMENTS

The general comments for this site was discussed at two meetings last week. I am providing here specific comments in the format desired. Please verify page numbers on material evaluation sheets; there are some duplicate sheets and also sheets with the same page number are shown for two different units.

SPECIFIC COMMENTS

<u>Page</u>	<u>Parag.</u>	<u>Line</u>	<u>Comment</u>
ii	3		Is there a need to describe tile and vinyl sheet colors here. The summary section need not contain specific details. ✓
2	3	2	Heating duct samples were collected at this site. Note boiler plate format is not appropriate here. ✓
2	4	3	However, "the State of" California.... ✓
3		3	is reported "in terms of" percent. ✓
3		5	delete sentence beginning with "Such estimates" or make it clear. I do not understand what you are saying.
3	Sec 2.1	15	Special instead of physical
3	Sec 2.1	1-8	Rewrite. The sampling rationale may contain a general paragraph, followed by site specific information in a following para. ✓
3	Sec 2.2	3	Use plural verb. You are referring to more than one in this sentence. ✓
4		2	I believe "otherwise" is one word ✓
4		4-5	In line 4 you say that the material (insulation) was considered to be in good condition. In the next line you say about instances of damage. Contradicts each other. ✓
4	5	3-4	Don't you want to say whether furnace exhaust duct and cloth expansion joint are ACM? I believe, it will also help to describe these two samples because these do not fall under the four major categories of samples. ✓